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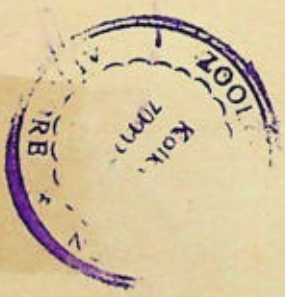
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Zoological Record Association

(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.

The circumstances attending the publication of this volume are fortunately unprecedented in the history of the work. The sudden death on the Niger of Mr. W. A. Forbes, the late Recorder of *Mammalia*, was soon followed by the loss of the help of Mr. Howard Saunders in the arduous Record of *Aves* (a loss necessitated by his undertaking at short notice the vacant editorship of Yarrell's "British Birds"). These serious gaps have, however, been supplied by Mr. Oldfield Thomas and Mr. R. B. Sharpe (a former Recorder); and the best thanks of working Zoologists are due to these gentlemen, who have undertaken an unexpected and difficult task. Mr. Boulenger has been compelled to seek the assistance of Mr. W. R. Ogilvie-Grant (an officer of the Natural History Department, British Museum) in the Record of *Pisces*; and Mr. Ridley, whose leisure is occupied with the Sponges of the 'Challenger' Expedition, has resigned the *Protozoa* to Mr. W. Saville-Kent, a well-known specialist. A special student of the *Myriopoda* has also been secured in Mr. T. D. Gibson-Carmichael. So many changes could not fail to be at first mechanically detrimental; but a more serious delay has arisen from the removal to South Kensington of the Natural History Department of the British Museum, in which nine of the Recorders (who do nearly two-thirds of the Record) are officially engaged. The continuous extra work thrown upon these gentlemen has prevented them from rigidly adhering to the dates fixed for delivering the different portions of the Record; hence the slight delay, which it is confidently expected will not again occur.

I have again the pleasure of acknowledging grants of £100 from the British Association for the Advancement of Science, and of £150 from the Government Grant Committee of the Royal Society, in aid of this undertaking. My thanks are also, as before, due to the Recorders, without whose aid under discouraging circumstances the delay in publication would have been still greater.

EDWARD CALDWELL RYE.

Royal Geographical Society,
1, Savile Row, Burlington Gardens, London,
January, 1884.

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

LIST OF THE

PRINCIPAL ABBREVIATED TITLES OF JOURNALS, &c.,

QUOTED IN THIS VOLUME.

Aardrijks. Weekbl.—Aardrijkskundig Weekblad (Dozy: Amsterdam).

Abh. böhm. Ges.—Abhandlungen der k. böhmischen Gesellschaft der Wissenschaften (Prague).

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

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

Abh. Ges. Isis—Abhandlungen der naturwissenschaftlichen Gesellschaft 'Isis' (Dresden).

Abh. senck. Ges.—Abhandlungen herausgegeben von der senckenbergischen naturforschenden Gesellschaft (Frankfort).

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

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

Abh. Ver. Hamb.—Abhandlungen aus dem Gebiete der Naturwissenschaften herausgegeben vom naturwissenschaftlichen Verein zu Hamburg-Altona.

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

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

Aid—C. O. Waterhouse's Aid to the Identification of Insects (Janson: London).

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

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

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

Am. Nat.—American Naturalist (Philadelphia).

Ann. Ac. Mâcon—Annales de l'Académie de Mâcon; Société des Arts, Sciences, Belles-lettres, et d'Agriculture.

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

Ann. Mus. Belg.—Annales du Musée Royal d'Histoire Naturelle de Belgique (Brussels).

Ann. Mus. Genov.—Annali del Museo civico di Storia Naturale di Genova (Genoa).

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

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

Ann. Sci. géol.—Annales des Sciences géologiques (Hébert & Milne-Edwards: Paris).

Ann. Sci. Nat. (6)—Annales des Sciences Naturelles. 6me série (Paris).

Ann. Sci. Nat. Bord.—Annales des Sciences Naturelles de Bordeaux et du Sud Ouest (Guillaud : Bordeaux & Paris).

Ann. Soc. Ent. Fr. (6)—Annales de la Société entomologique de France. 6me série (Paris).

Ann. Soc. L. Lyon (*n.s.*)—Annales de la Société Linnéenne de Lyon. Nouvelle série.

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

Ann. Soc. Mod.—Annuario della Società dei Naturalisti di Modena.

An. Soc. Arg.—Anales de la Sociedad cientifica Argentina (Buenos Aires).

An. Soc. Esp.—Anales de la Sociedad Española de Historia Natural (Madrid).

Anz. Ak. Wien — Anzeiger der mathematisch-naturwissenschaftlichen Classe der K. Akademie der Wissenschaften zu Wien.

Anz. Vers. böhm. Aertze—Anzeiger der [zweiten] Versammlung böhmischer Aerzte und Naturforscher.

Arb. Inst. Würzb.—Arbeiten aus dem zoologisch-zootomischen Institut in Würzburg.

Arb. z. Inst. Wien—Arbeiten des zoologischen Instituts in Wien.

Arch. Anat. Phys.—Archiv für Anatomie und Physiologie (His, Braune, & Du Bois Reymond: Leipzig).

Arch. biol.—Archives de Biologie (Van Beneden & Van Bambeke: Ghent).

Arch. f. Nat. (2)—Archiv für Naturgeschichte. Neue Folge (Berlin).

Arch. ges. Phys.—Archiv für die gesammte Physiologie des Menschen und der Thiere (Pflüger : Bonn).

Arch. Ital. Biol.—Archives Italiennes de Biologie ; Revues, Résumés, Reproductions des travaux scientifiques Italiens (Emery & Mosso : Turin).

Arch. Math. Naturvid.—Archiv for Mathematik og Naturvidenskab (Christiania).

Arch. mikr. Anat.—Archiv für mikroskopische Anatomie (Bonn).

Arch. Miss. sci.—Archives des Missions scientifiques et littéraires (Paris).

Arch. Mus. Lyon—Archives du Muséum d'Histoire Naturelle de Lyon.

Arch. Nat. Liv.—Archiv für die Naturkunde Liv-, Ehst-, und Kurlands (Dorpat).

Arch. Néerl.—Archives Néerlandaises des Sciences exactes et naturelles (Baumhauer: The Hague).

Arch. path. Anat.—Archiv für pathologische Anatomie und Physiologie und für klinische Medicin (Virchow : Berlin).

Arch. Sci. nat.—Archives des Sciences physiques et naturelles (Geneva).

Arch. Ver. Mecklenb.—Archiv des Vereins der Freunde der Naturgeschichte in Mecklenburg.
Arch. Z. expér.—Archives de Zoologie expérimentale et générale (Paris).
Atti Acc. Nap.—Atti dell' Accademia di Scienze fisiche e matematiche di Napoli.
Atti Acc. Rom.—Atti della R. Accademia dei Lincei (Rome).
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Atti Ist. Venet.—Atti del R. Istituto Veneto di scienze, &c. (Venice).
Atti Soc. Ital.—Atti della Società Italiana di Scienze naturali (Modena).
Atti Soc. Pad.—Atti della Società Veneto-Trentina di Scienze naturali (Padua).
Atti Soc. Tosc.—Atti della Società Toscana di Scienze naturali residente in Pisa.
Atti Soc. Ven.-Trent = *Atti Soc. Pad.*

Bayer. Fisch.-Z.—Bayerische Fischerei-Zeitung.
Beitr. Biol.—Beiträge zur Biologie (Bischoff : Stuttgart).
Beitr. Pal. Oesterr.-Ung.—Beiträge zur Paläontologie Oesterreich-Ungarn's und des Orients (Mojsisovics & Neumayr : Vienna).
Beitr. Russ. Reiches (2)—Beiträge zur Kenntniss des Russischen Reiches und der angrenzenden Länder Asiens. Neue Folge (St. Petersburg).
Ber. senck. Ges.—Bericht der senckenbergischen naturforschenden Gesellschaft (Frankfort).
Ber. Ver. Innsbr.—Berichte des naturwissenschaftlich-medicinischen Vereins, Innsbruck.
B. E. Z.—Berliner entomologische Zeitschrift.
Bibl. École Hautes Ét.—Bibliothèque de l'École des Hautes Études, Section des Sciences Naturelles (Paris).
Bibl. med. contemp.—Biblioteca Medica Contemporanea (Bologna).
Biol. Centralbl.—Biologisches Centralblatt (Rosenthal : Erlangen).
Biol. Untersuch.—Biologische Untersuchungen (Retzius : Stockholm).
Bl. böhm. Vogelsch. Ver.—Blätter des böhmischen Vogelschutz Verein (Prague).
Bol. Ac. Arg.—Boletin de la Academia Nacional de Ciencias de la Republica Argentina (Cordoba).
Boll. scient.—Bollettino scientifico (Maggi, Zoja, & Giovanni : Pavia).
Boll. Soc. Adr.—Bolletino della Società Adriatica di Scienze naturali (Trieste).
Bot. Z.—Botanische Zeitung (Halle).
Brit. Med. J.—British Medical Journal (London).
Bull. Ac. Belg. (3)—Bulletin de l'Académie Royale des Sciences de Belgique. 3me série (Brussels).
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Bull. U. S. Fish. Comm.—Bulletin of the United States Fish Commission (Washington).
Bull. U. S. Geol. Surv.—Bulletin of the United States Geological and Geographical Survey of the Territories (Washington).
Bull. U. S. Nat. Mus.—Bulletin of the United States National Museum (Washington).

Canad. Ent.—Canadian Entomologist (Saunders: Montreal).
Canad. Nat. (*n.s.*)—The Canadian Naturalist and Quarterly Journal of Science. New series (Montreal).
CB. Ver. Regensb.—Correspondenz-Blatt des zoologisch-mineralogischen Vereins in Regensburg (Ratisbon).
Chrysanthemum—The Chrysanthemum: a Monthly Magazine for Japan and the Far East (Yokohama).
Cist. Ent.—Cistula Entomologica (Janson: London).
Congr. Sci. = *C. R. Ass. Fr. Sci.*
C.R. Ass. Fr. Sci.—Compte-rendu de l'Association Française pour l'avancement des Sciences.
C.R.—Comptes rendus des Séances hebdomadaires de l'Académie des Sciences (Paris).
C.R. ent. Belg.—Comptes rendus des Séances de la Société entomologique de Belgique (Brussels).

Dan. Selsk. Skr.—K. Danske Videnskabernes Selskabs Skrifter (Copenhagen).
Denk. Ak. Wien—Denkschriften der k. Akademie der Wissenschaften zu Wien (Vienna).
Deutsche e. Z.—Deutsche entomologische Zeitschrift (Berlin).

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

Feuill. Nat.—Feuille des jeunes Naturalistes (Paris).
Field Naturalist—The Field Naturalist and Scientific Student (Manchester).
Forh. Selsk. Chr.—Forhandlinger i Videnskabs-Selskabet i Christiania.

Gard. Chron. (2)—The Gardeners' Chronicle. 2nd series (London).
Gef. Welt—Die gefierdte Welt: Zeitschrift für Vogelliebhaber, -zuchter und -händler (Russ: Berlin).
Geol. Mag.—Geological Magazine (Woodward: London).
Giorn. Sci. Palerm.—Giornale di Scienze naturali ed economiche di Palermo.
Göteb. Mus. Årsskr.—Göteborg's naturhistorisk Museum's Årsskrift.
Götting. Nachr. = *Nachr. Ges. Götting.*

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

Humboldt—Humboldt: Monatsschrift für die gesammten Naturwissenschaften (Stuttgart).

Ibis—The Ibis (Salvin: London).

Izv. Liub. Est. Antr. Etno.—Izvestia Imperatorskago Obschestva Liubitelei Estestvoznania Antropologii i Etnographii = *Bull. Sci. Nat Mosc.* = *Nachr. Ges. Mosc.*

J. Anat. Phys.—Journal of Anatomy and Physiology (Humphry: London).

J. A. S. B.—Journal of the Asiatic Society of Bengal (Calcutta).

JB. geol. Reichsanst.—Jahrbuch der k.-k. geologischen Reichsanstalt (Vienna).

JB. Ges. Emden—Jahresbericht der naturforschenden Gesellschaft, Emden.

JB. Ges. Graub.—Jahresbericht der naturforschenden Gesellschaft Graubündens (Chur).

JB. Karpath. Ver.—Jahrbuch des ungarischen Karpathen-Vereines (Késmark).

JB. mal. Ges.—Jahrbuch der deutschen malakozoologischen Gesellschaft (Kobelt: Frankfort).

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

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

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

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

JB. Tharand. Ges.—Jahrbuch der Tharanden forstlichen Gesellschaft (Dresden).

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

JB. westf. Ver.—Jahresbericht der zoologischen Section des westfälischen provinzial-Vereins für Wissenschaft und Kunst (Münster).

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

J. de Conch.—Journal de Conchyliologie (Crosse & Fischer: Paris).

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

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

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

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

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

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

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

J. Micr. Soc. Vict.—Journal of the Microscopical Society of Victoria (Melbourne).

J. Northampt. Soc.—Journal of the Northampton Natural History Society and Field Club (Sanders, Scriven & Thompson: Northampton).
J. of Conch.—Journal [formerly Quarterly Journal] of Conchology (London).
J. R. Agric. Soc. (2)—Journal of the Royal Agricultural Society. Second series (London).
J. R. Micr. Soc. (2)—Journal of the Royal Microscopical Society. Second series (London).
J. Sci.—The Journal of Science and Annals of Astronomy, Biology, &c. (London, formerly Quarterly Journal of Science).
J. Sci. Lisb.—Jornal de Sciencias da Academia de Lisboa (Lisbon).
J. Soc. Arts—Journal of the Society of Arts (London).

Kosmos—Kosmos: Zeitschrift für einheitliche Weltauschauung auf Grund der Entwickelungslehre.
Kosmos; Lemb.—Kosmos: Zeitschrift der polnischen naturforschenden Gesellschaft Kopernicus (Lemberg).

L'Ab.—L'Abeille (De Marseul: Paris).
La Nature—La Nature, Revue des Sciences, &c. (Tissandier: Paris).
Le Nat.—Le Naturaliste (Deyrolle: Paris).

Mal. Bl.—Malakozoologische Blätter (Clessin: Cassel).
Mem. Acc. Bologn.—Memorie dell' Accademia di Scienze dell' Istituto di Bologna.
Mem. Acc. Tor.—Memorie della R. Accademia della Scienze di Torino (Turin).
Mém. Ac. Montp.—Mémoires de l'Académie des Sciences et lettres de Montpellier.
Mém. Ac. Pétersb. (7)—Mémoires de l'Académie impériale des Sciences de St. Pétersbourg. 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).
Mem. Geol. Surv. Engl.—Memoirs of the Geological Survey of England and Wales.
Mem. Geol. Surv. Ind.—Memoirs of the Geological Survey of India [= *Pal. Ind.*] (Calcutta).
Mem. Ist. Venet.—Memorie del R. Istituto Veneto di Scienze, &c. (Venice).
Mém. Liége—Mémoires de la Société Royale des Sciences de Liége.
Mém. Soc. Biol.—Mémoires de la Société de Biologie (Paris).
Mém. Soc. Bord.—Mémoires de la Société des Sciences physiques et naturelles de Bordeaux.
Mém. Soc. Cherb.—Mémoires de la Société des Sciences naturelles de Cherbourg.
Mém. Soc. Géol. (3)—Mémoires de la Société Géologique de France. 3me série (Paris).
Mém. Soc. Nouv. Russ.—Mémoires de la Société des Naturalistes de la Nouvelle Russie (Odessa).

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

Midl. Nat.—The Midland Naturalist: the Journal of the Associated Natural History, Philosophical, and Archæological Societies and Field Clubs of the Midland Counties (Badger & Harrison: Birmingham).

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

MT. forstl. Versuchsw. Oesterr.—Mittheilungen aus dem forstlichen Versuchswesen Oesterreichs (Vienna).

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

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

MT. 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. Vorpomm.—Mittheilungen aus dem naturwissenschaftlichen Vereine von Neu-Vorpommern und Rügen (Griefswald).

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.—Nachrichten der k. Gesellschaft der Liebhaber der Naturkunde zu Moscou.

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

N. Act. Ups.—Nova Acta R. Societatis Scientiarum Upsaliensis.

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

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

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

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

Natur—Die Natur: Zeitung zur Verbreitung naturwissenschaftlichen Kenntniss und Naturanschauung für Leser alle Stände. Organ des deutschen Humboldt-Verein (Müller: Halle).

Naturalist—The Naturalist: Journal of the Yorkshire Naturalists' Union, &c. (Hobkirk & Porritt: Huddersfield).

Nature—Nature (London).

N. Denk. schw. Ges.—Neue Denkschriften der allgemeinen schweizerischen Gesellschaft für die gesammten Naturwissenschaften.

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

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

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

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

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

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

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

N. Z. J. Sci.—The New Zealand Journal of Science (Dunedin).

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

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

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

Overs. Dan. Selsk.—Oversigt over dat k. Danske Videnskabernes Selskabs Forhandlinger (Copenhagen).

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

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

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

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

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

Pamietnik Wydz. Akad. Umiej. Krakow.—Pamietnik, Wydzial matematyczno-przyrodniczy Akademii umiejetnosci w Krakowie [Memoirs of the Mathematical and Natural History Section of the Academy of Science at Cracow].

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

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

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

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

P. Cal. Ac.—Proceedings of the California Academy of Sciences (San Francisco).

P. Canad. Inst.—Proceedings of the Canadian Institute (Toronto).

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

P. Eastbourne Soc.—Annual Report and Proceedings of the Eastbourne Natural History Society.

Periód. Zool. Argent.—Periódico Zoológico (Cordoba).

P. E. Soc.—Proceedings of the Entomological Society of London.
P. G. Soc.—Proceedings of the Geological Society (London).
Phil. Tr.—Philosophical Transactions of the Royal Society (London).
P. Linn. Soc. N. S. W.—Proceedings of the Linnean Society of New South Wales (Sidney).
P. Liverp. Soc.—Proceedings of the Literary and Philosophical Society and Natural History Society of Liverpool.
P. N. H. Soc. Glasg.—Proceedings of the Natural History Society of Glasgow.
Pop. Sci. Rev. (n.s.)—Popular Science Review. 2nd series (London).
P. Phil. Soc. Glasg.—Proceedings of the Literary and Philosophical Society of Glasgow.
P. Phys. Soc. Edinb.—Proceedings of the Royal Physical Society of Edinburgh.
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. & Rep. R. Soc. Tasm.—Papers and Proceedings and Reports 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 (Washington).
P.-v. Ak. Amst.—Processen-Verbaal der Koninklijke Akademie van Wetenschappen te Amsterdam.
P.-v. Soc. Mal. Belg.—Procès-verbaux des séances de la Société malacologique de Belgique (Brussels).
P.-v. Soc. Tosc.—Processi verbali della Società Toscana di Scienze naturali (Pisa).
P. Warw. Club—Reports of Proceedings of the Warwickshire Naturalists' and Archæologists' Field Club (Warwick).
P. Z. S.—Proceedings of the Zoological Society (London).

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

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. Acc. Nap.—Rendiconti dell' Accademia di Scienze fisiche e matematiche di Napoli.
Rend. Ist. Lomb.—Rendiconti del R. Istituto Lombardo di Scienze, &c. (Milan).
Rep. Birming. Soc.—Annual Report of the Birmingham Natural History and Microscopical Society.
Rep. Brit. Ass.—Report of the British Association for the Advancement of Science.

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

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

Rep. Geol. Surv. Ohio — Report of the Geological Survey of Ohio (Columbia).

Rep. Ins. = *Rep. Dep. Agric.*

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

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

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

Rev. d'Ent. — Revue d'Entomologie, publié par la Société Française d'Entomologie (Fauvel : Caen).

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

Rev. Soc. Porto—Revista da Societa de Instrucção de Porto.

SB. Ak. Berlin—Sitzungsberichte der königlich preussischen Akademie der Wissenchaften zu Berlin.

SB. Ak. Krakow.—Rozprawy i Sprawozdania z Posiedzén, Wydzial matematyczno-przyrodniczy Akademii umiejetnosci w Krakowie [Proceedings of the Mathematical and Natural History Section of the Academy of Science at Cracow].

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

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

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

SB. bot. Ver. Brandenb.—Sitzungsberichte des botanischen Vereins für die Provinz Brandenburg (Berlin).

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

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

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

SB. Ges. Marb.—Sitzungsberichte der Gesellschaft zur Beförderung der gesammten Naturwissenschaften zu Marburg.

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

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

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

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

Sci. Amer.—Scientific American.
Sci. Goss.—Science Gossip (Taylor: London).
Scot. Nat.—The Scottish Naturalist (White: Edinburgh & London).
S. E. Z.—Stettiner entomologische Zeitung (Dohrn: Stettin).
Sprawozd. Kom. fizogr.—Sprawozdanie Komisyi fizyograficznéj, &c. (Cracow).
Str. Feath.—Stray Feathers (Calcutta).
Stud. Biol. Lab. Hopkins Univ.—Studies at the Biological Laboratory of the Hopkins University (Baltimore).
Sv. Ak. Handl.—K. Svenska Vetenskaps Akadamiens Handlingar (Stockholm).

Term. füzetek—Természetrajzi füzetek: áz allat-, 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 van de Nederlandsche Dierkundige Vereeniging (The Hague & Rotterdam).
Tijdschr. Nederl. Ind.—Natuurkundig Tijdschrift voor Nederlandsch Indië (Batavia).
Tr. Ac. St. Louis—Transactions of the Academy of Sciences of St. Louis.
Tr. Am. Ent. Soc.—Transactions of the American Entomological Society (Philadelphia).
Tr. A. S. Japan—Transactions of the Asiatic Society of Japan (Yokohama).
Trav. Lab. Histol.—Travaux du Laboratoire d'Histologie du Collège de France, École pratique des Hautes Études (Ranvier: Paris).
Tr. Conn. Ac.—Transactions of the Connecticut Academy of Sciences (New Haven).
Tr. Devon. Ass.—Report and Transactions of the Devonshire Association for the Advancement of Science, &c. (Plymouth).
Tr. Epping Nat. Club—Transactions of the Epping Forest and County of Essex Naturalists' Field Club (Buckhurst Hill).
Tr. E. Soc.—Transactions of the Entomological Society of London.
Tr. Hertf. Soc.—Transactions of the Hertfordshire Natural History Society and Field Club (Watford).
Tr. Int. Med. Congr.—Transactions of the International Medical Congress (London).
Tr. L. S. (2)—Transactions of the Linnean Society, London. Second series.
Tr. L. S. N. York—Transactions of the Linnean Society of New York.
Tr. Norw. Soc.—Transactions of the Norfolk and Norwich Naturalists' Society (Norwich).
Tr. N. Z. Inst.—Transactions and Proceedings of the New Zealand Institute (Wellington).
Tromsö Mus. Aarsh.—Tromsö Museum's Aarshefter.
Troudy Ent. Ross. = Transactions of the Russian Entomological Society (St. Petersburg).

Tr. R. Dublin Soc. (2)—The Scientific Transactions of the Royal Dublin Society. Second series.

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

Tr. R. Soc. S. Austr.—Transactions of the Royal Society of South Australia (Adelaide).

Tr. Soc. Univ. Kharkow—Travaux de la Société des Naturalistes à l'Université Impériale de Kharkow.

Tr. Wiscons. Ac.—Transactions of the Wisconsin Academy of Sciences, Arts and Letters (Madison).

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

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

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

Unters. Naturl. Mensch.—Untersuchungen zur Naturlehre des Menschen und der Thiere (Moleschott: Frankfort).

Vergl. physiol. Stud.—Vergleichend-physiologische Studien: Experimentelle Untersuchungen (Krukenberg: Heidelberg).

Verh. geol. Reichsanst.—Verhandlungen der k.-k. geologischen Reichsanstalt (Vienna).

Verh. Ges. Basel—Verhandlungen der naturforschenden Gesellschaft (Bâle).

Verh. Ges. Würzb.—Verhandlungen der physikalisch-medicinischen Gesellschaft in Würzburg.

Verh. L.-C. Ak.—Verhandlungen der königl. Leopoldinisch-Carolinisch deutschen Akademie der Naturforscher (Dresden).

Verh. siebenb. Ver.—Verhandlungen und Mittheilungen des siebenbürgischen Vereins für Naturwissenschaften (Hermannstadt).

Verh. Ver. Brünn—Verhandlungen des naturforschenden Vereins in Brünn.

Verh. Ver. Hamb.—Verhandlungen des Vereins für naturwissenschaftliche Unterhaltung zu Hamburg.

Verh. Ver. Rheinl.—Verhandlungen des naturhistorischen Vereins der preussichen Rheinlande und Westphalen (Budge: Bonn).

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

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

Vidd. Medd.—Videnskabelige Meddelelser fra den naturhistoriske Forening (Copenhagen).

Vid. Selsks. Skr. = *Nor. Selsks. Skr.*

Wien. ent. Z.—Wiener entomologische Zeitschrift.

Yorksh. Nat. = Naturalist.

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

Z. Ferd.—Zeitschrift des Ferdinandeums (Innsbruck).

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

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

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

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

Zool. Gart.—Der zoologische Garten (Wienland, Bruch & Noll: Frankfort).

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

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

Z. wiss. Geogr.—Zeitschrift für wissenschaftliche Geographie (Kettler: Lahr, in Baden).

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

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AVES.

P. 21. Above "ACCIPITRES," insert "Sub-class CARINATÆ."
P. 28, line 13, for "*Apalis*," read "*Hapalis*."
P. 41, line 8, for "*Æna*," read "*Œna*."
P. 41, line 4 from bottom, for "*Pterocleles*," read "*Pterocletes*."

PISCES.

P. 27, for "HETEROPYGII," read "HETEROPYGII," and dele "HETEROPYGII" from head-line.
P. 29, head-line, for "HETEROPYGII," read "PHYSOSTOMI."

VERMES.

P. 10, lines 11 & 12 from bottom, for "Nova Acta Halle," read "Nova Acta Ac. L.-C. Nat. cur."

ZOOLOGICAL RECORD

FOR 1882.

Accno. 456
dt. 12/12/06

MAMMALIA.

BY

OLDFIELD THOMAS, F.Z.S.

THE year 1882 does not differ materially from its predecessor in the large number of papers, anatomical, systematic, and faunal, which have appeared, while, with but one or two exceptions, few separate works of importance have been published.

A complete natural history of the *Insectivora* has been commenced by Dobson (p. 25), whilst Flower (p. 37) has revised the arrangement of the *Edentata*, and Mivart (p. 18) that of the *Æluroidea*. Valuable anatomical work has been done by these authors, as also by Forbes (pp. 22, 35, 38), the late Mammal Recorder, whose last papers are now noted, by Klein (pp. 9, 19), Kölliker (p. 9), Lankester (pp. 22, 39), Lewis (p. 10), Robin (p. 23), and others. No very important faunal publications have appeared, though Collett (p. 4), Merriam (p. 11), Müller (p. 11), Winge (p. 16), and others, have contributed papers illustrative of the faunas of comparatively small or well-known districts. 46 new recent species have been described, as compared with 36 in 1881, and 38 in 1880.

THE GENERAL SUBJECT.

ALLEN, H. On a Revision of the Ethmoid Bone in the *Mammalia*, with special reference to the description of this bone and of the sense of smelling in the *Chiroptera*. Bull. Mus. C. Z. x. p. 135 (No. 3).

Contains descriptions of the ethmoid in the *Mammalia* generally, and more in detail of that of the horse, peccary, sloth, cat, seal, mole, and of many genera of *Chiroptera*. The author comes to the conclusion that the

study of the folds of this bone might be of considerable service in determining the systematic position of doubtful forms. As to the *Chiroptera*, his results agree very closely with those of other authors. A section is also devoted to the "Physiological Anatomy of the Olfactory Sense," in the *Mammalia*. The memoir is illustrated by seven plates showing the structure of the ethmoid in the various groups. [See also *Procyonidæ*.]

ALLEN, J. A. [See *Cetacea*, *Sirenia*.]

ALLEN, W. Omphalo-mesenteric remains in Mammals. J. Anat. Phys. xvii. p. 59.

Permanent remnants of this system of vessels noted in certain *Carnivora* and *Rodentia*.

ANDERSON, J. Catalogue of *Mammalia* in the Indian Museum, Calcutta. Part I. *Primates*, *Prosimiæ*, *Chiroptera*, and *Insectivora*. Calcutta: 1881, 8vo.

The first part of a most useful work, not only for persons interested in the museum of which it is a catalogue, but for all systematic zoologists, as it contains full synonymies of the species, descriptions in many cases, and lists of specimens with, when known, their exact localities. In all, 2183 specimens are catalogued, belonging to 68 genera and 252 species. 2 species are described as new to science [see *Vespertilionidæ*, *Soricidæ*.]

ANNELL, G. Beiträge zur Kenntniss der zahnbildenden Gewebe des Menschen und der Säugethiere. Biol. Unters. (Stockholm) ii. 1882, p. 3.

On the structure and development of the enamel-organs and teeth of *Mammalia*.

BAJARDI, D. Sur la reproduction de la moelle des os longs. Arch. Ital. Biol. i. p. 20.

BARFURTH, D. Zur Entwicklung der Milchdrüse. Bonn: 1882, 8vo.

[Not seen by Recorder; *cf.* Zool. Anz. vi. p. 263.]

BARROIS, C. T. Contribution à l'étude des Enveloppes du Testicule. Lille: 1882, 8vo, 56 pp.

[Not seen by Recorder; *cf.* Zool. Anz. vi. p. 9.]

BAUME, R. Versuch einer Entwicklungsgeschichte des Gebisses. Leipzig: 1882, 8vo, 308 pp.

Forms the first part of the author's "Odontologischen Forschungen." [Not seen by Recorder; *cf.* Morph. JB. viii p. 684.]

BEAUREGARD, H. [See *Balænidæ*.]

BIZZOZERO, E. Sur un nouvel élément morphologique du sang chez les Mammifères. Arch. Ital. Biol. i. pp. 1 & 274, and ii. p. 345.

[*Cf.* also J. R. Micr. Soc. 1882, p. 480.]

BJORKMAN, G. [See WALLER, C.]

Bocage, J. V. Barboza du. Liste des Mammifères envoyés de Caconda, Angola, par M. d'Anchieta. J. Sci. Lisb. ix. p. 25.

27 species are enumerated, with notes by the collector on their rarity, habits, and native names. 3 species are new [see *Macroscelididæ*, *Viverridæ*, *Muridæ*].

Born, G. Über die Derivate der embryonalen Schlundbogen und Schlundspalte bei Säugethieren. Z. ärztl. Breslau, 1882, No. 24.

[Not seen by Recorder; *cf.* Zool. Anz. vi. p. 263.]

Boulart, R. [See *Balænidæ*.]

Brants, M. A. Het spijsverteeringskanaal by Zoogdieren en Vogels. Utrecht: 1882, 8vo, pp. 119.

On the comparative length of the intestinal canal in Mammals and Birds.

Braun, M. Entwickelungsvorgänge am Schwanzende bei einigen Säugethieren mit Berücksichtigung der Verhältnisse beim Menschen. Arch. Anat. Phys. 1882, p. 207; and SB. Ges. Dorp. vi. p. 334.

Observations on the tail-tips of embryo rabbits, rats, mice, pigs, cows, sheep, dogs, monkeys, and men.

Brayton, A. W. *Mammalia* of Ohio. In Rep. Geol. Surv. Ohio, iv. 1882.

[Not seen by Recorder; *cf.* Am. Nat. xvii. p. 634.]

Brewer, W. H. On the Disposition of Colour-markings of Domestic Animals. P. Am. Ass. 1881 (Cincinnati), p. 246.

Contains numerous observations on the form and variability of the colour markings of domestic animals, especially with reference to the white marks so commonly found on the limbs of horses.

Broesike, G. Ueber die feinere Structur des normalen Knochengewebes. Arch mikr. Anat. xxi. p. 695.

Brown, G. T. Dentition as indicative of the age of the animals of the Farm. J. R. Agric. Soc. (2) xviii. p. 385.

A most useful account, especially for agricultural purposes, of the changes in dentition which occur in the horse, ox, sheep, and pig from birth to maturity. Illustrated by numerous woodcuts.

Camerano, L. [See *Otariidæ*.]

Capello, H., & Ivens, R. From Benguella to the territory of Yacca; description of a journey into Central and West Africa; translated from the Portuguese by A. Elwes. London: 1882, 8vo.

Contains incidental notes on the Mammals observed, and an appendix of the fauna, in which the names of the Mammals are supplied by Prof. J. V. Barboza du Bocage.

CATON, J. D. The Antelope and Deer of America: a comprehensive treatise upon the natural history, including the characteristics, habits, affinities, and capacity for domestication of the *Antilocapra* and *Cervidæ* of North America. Boston: 1881, 8vo.

Revised and corrected edition; *cf.* Zool. Rec. xiv. *Mamm.* p. 2.

CATTANEO, G. [See *Macropodidæ*.]

CHABRY, —. [See *Balænidæ*.]

CHATIN, J. Sur l'existence des cônes dans la rétine de la Souris. Bull. Soc. Philom. (7) vi. p. 128.

Shows that Schultze was wrong in attributing a considerable physiological importance to the presence of cones in the retina.

COCKS, A. H. On Mammals met with in Spitzbergen. Zool. (3) vi. p. 404.

COLLETT, R. Meddelelser om Norges Pattedyr i Aarene 1876-81. N. Mag. Naturv. xxvii. p. 217.

A complete list of the Scandinavian fauna is given, with special notes on the greater number of the species. [A separate copy only seen.]

COPE, E. D. The Tertiary Formations of the Central Region of the United States. Am. Nat. xvi. p. 177.

Contains descriptions of the beds from which many of the fossil *Mammalia* described by the author and by Prof. Marsh were obtained.

——. On the group *Ungulata*. Am. Nat. xvi. p. 522.

The following arrangement is proposed:—

I. Os magnum supporting os lunare, and not articulating with os scaphoideum.

a. Astragalus articulating only with navicular.
Fibula with interlocking articulation with astragalus. *Hyracoidea*.
Fibula with lateral contact only with astragalus. *Taxeopoda* (Ord. nov.)

b. Astragalus uniting with both navicular and cuboid.
Lunar united to unciform; fibula only in contact with astragalus. *Amblypoda*.

II. Os magnum supporting os scaphoideum; lunar supported in part by unciform. Astragalus uniting with both cuboid and navicular.
Astragalus truncate distally; median digit longest. *Perissodactyla*.
Astragalus ginglymoid distally; two median digits equal. *Artiodactyla*.

The new order *Taxeopoda* is then subdivided into the *Proboscidea* and the *Condylarthra* *; and the *Toxodontia* should, perhaps, form a third

* It being impossible to follow the rapid changes made by Prof. Cope in the arrangement of the numerous new forms described by him, the order adopted last year is continued for the present, the *Condylarthra* being still treated as a suborder of the *Perissodactyla* (see *infrà*, p. 32).—O. T.

division. [See also *Taeniodonta*, *Tillodonta*, *Creodonta*, *Perissodactyla*, *Artiodactyla*.]

Cowan, W. Deans. Notes on the Natural History of Madagascar. P. R. Soc. Edinb. vii. pt. 1, p. 133.

Contains information as to the distribution of the Mammals met with by the author.

Cunningham, D. J. Report on some points in the anatomy of the Thylacine (*Thylacinus cynocephalus*), Cuscus (*Phalangista maculata*), and Phascogale (*Phascogale calura*), collected during the voyage of H.M.S. 'Challenger' in the years 1873–76, with an account of the comparative anatomy of the intrinsic muscles and the nerves of the Mammalian Pes. Rep. Expl. Voy. H.M.S. 'Challenger,' Zool. v. 1882.

Contains the detailed anatomy of these animals, with incidental notes on many others. The muscles of the foot are especially fully worked out and figured, with particular reference to their relations to one another, and in comparison with those of various other Mammals of all Orders. An abstract of the author's results as to the evolution of the pedal muscles has been already published [*cf.* Zool. Rec. xv. *Mamm.* p. 3].

Darwin, C. [See Van Dyck, W.]

Denis, A. Hyères ancien et moderne. Hyères: 1882, 8vo.

Contains (p. 582) a few notes on the Mammals of Hyères.

De Sanctis, L. [See *Physeteridæ*.]

Dobson, G. E. A Monograph of the *Insectivora*, Systematic and Anatomical. Part i. London: Jan. 1882, 4to. [See below, *Insectivora*, p. 25].

——. On the Digastric Muscle, its Modifications and Functions. Tr. L. S. (2) ii. p. 259.

Gives an account of the variations in the form of this muscle in various *Mammalia*.

——. On the Homologies of the Long Flexor Muscles of the Feet of *Mammalia*, with remarks on the value of their leading modifications in classification. J. Anat. Phys. xvii. p. 142. [Abstract in Rep. Brit. Ass. 1882, p. 574.]

This paper contains accounts, most of which are original, of the deep flexor muscles of the feet of various *Mammalia*, especially of the *Insectivora*. The author considers that there are two chief types of arrangement of the tendons of these muscles, calling them the *Centeles*- and the *Erinaceus*- types. In the first of these the tendon of the flexor digitorum tibialis is united in the foot with that of the flexor digitorum fibularis; in the second these two tendons are entirely distinct from each other. The author then proceeds to draw various deductions from the facts observed in reference to the natural positions of certain groups of Mammals.

[Dobson, G. E.] Note on the rectus abdominis et sternalis Muscle. J. Anat. Phys. xvii. p. 84.

Remarks on the homologies of this muscle, with a description of its position in *Chrysochloris*. [See also *Dipodidæ*.]

Doederlein, L. Ueber einige Japanische Säugethiere. MT. Ges. Ostasiens, iii. p. 210.

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

Doering, A. Observaciones generales sobre la Fauna del Territorio conquistado, in Informe Oficial de la Comision cientifica agregada al Estado Mayor General de la Expedicion al Rio Negro. 1. Zoologia. Buenos Aires: 1881, 4to.

Contains lists of Mammals obtained in various districts adjoining the Rio Negro, Patagonia.

Douvillé, —. Sur le gisement quaternaire de Montreuil. Bull. Soc. Géol. (3) x. p. 295.

Contains notes on *Elephas*, *Trogontherium*, &c.

Dybowski, —. Notes on Mammals observed in Kamschatka. La Nature, x. (1) p. 297, and (2) p. 213.

Elliott, D. G. [See *Felidæ*.]

——, H. W. A Monograph of the Seal Islands of Alaska. Washington: 1882, 4to, pp. 176.

A revised and extended reprint of the same author's "Report on the Prybilow Group, or Seal Islands of Alaska," Washington, 1873. [*Cf.* Zool. Rec. x. p. 2.)

Ferré, G. Contribution à l'etude de la crête auditive chez les vertébrés. Ann. Sci. Nat. Bord. 1882, p. 137.

Filhol, H. Notes sur quelques Mammifères fossiles de l'époque miocène. Lyon: 1881, 4to, 97 pp. 5 pls. Arch. Mus. Hist. Nat. Lyon, iii.

This work consists of four separate papers—1. "Observations relatives à divers Mammifères fossiles, provenant de Saint Gerand-le-Puy." Gives an account of various fossils obtained by the late Dr. Jourdan, but not described by him. 2. On *Dinocyon thenardi*, Jourd. 3. "Sur divers carnassiers fossiles provenant de la Grève St. Alban, Isère." This contains the description of several new fossil *Carnivora* (see *Felidæ*, *Mustelidæ*). 4. "Observations relatives aux chiens actuels et aux carnassiers fossiles qui s'en rapprochent le plus." In this paper, the author expresses his opinion that *Amphicyon* is the ancestor of the living *Canidæ* and (perhaps) *Ursidæ*, and *Cynodictis* that of the *Viverridæ*. [Not seen by Recorder; *cf.* Ann. Sci. Nat. (6) xii. 1881.]

——. Mémoires sur quelques Mammifères fossiles des phosphorites du Quercy. Toulouse: 1882, 4to.

[Not seen by Recorder; *cf.* Zool. Anz. v. p. 490, and Am. Nat. xvii. p. 183, abstract. See also *Nimravidæ*, *Suidæ*.]

Flower, W. H. [See *Lemures*, *Cetacea*, *Physeteridæ*, *Edentata*, *Macropodidæ*.]

Forbes, W. A. [See *Otariidæ*, *Cervidæ*, *Myrmecophagidæ*.]

Franck, L. Handbuch der Anatomie der Hausthiere. Mit besonderer Berücksichtigung des Pferdes. Second Edition, Part I. Stuttgart: 1882, 8vo.

[Not seen by Recorder; *cf.* Zool. Anz. vi. p. 262.]

Fraser, A. On the development of the Ossicula auditus in the higher *Mammalia*. Phil. Tr. clxxiii. p. 901. Abstract in P. R. Soc. xxxiii. p. 446.

Fric, J. Uebersicht der diluvialen Säugethiere Böhmens. SB. böhm. Ges. 1881, p. 493.

Contains notes on various fossil species of *Mammalia* found in the diluvial deposits of Bohemia.

Gadow, H. Observations in Comparative Myology. J. Anat. Phys. xvi. p. 493.

Consists of remarks on the nomenclature, development, and homologies of the muscles of *Vertebrata*. The author explains the system by which the muscles are named according to their places of origin and insertion, and shows the manner in which many of their leading modifications have come about. Most of the arguments are founded on Reptiles and Batrachians, but the results are equally applicable to the *Mammalia*.

Gage, S. H. [See Wilder, B. G.]

Ganser, S. [See *Talpidæ*.]

Gentil, A. Mammalogie de la Sarthe. Le Mans: 1882, 8vo, pp. 48. (Extract from Bull. Soc. d'Agric. de la Sarthe.)

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

Giacomini, C. Bandelette de l'uncus de l'hippocampe dans le cerveau de l'homme et de quelques animaux. Arch. Ital. Biol. ii. p. 207.

Golgi, G. Origine du tractus olfactorius et structure des lobes olfactifs de l'homme et d'autres Mammifères. Arch. Ital. Biol. i. p. 454.

Gottschau, M. Ueber Nebennieren der Säugethiere, speciell über die des Menschen. SB. Ges. Würzb. 1882, p. 56.

On the anatomy of the subrenal glands of *Mammalia*.

——. Ueber Geschmacksorgane der Wirbelthiere. Biol. Centralbl. ii. p. 248.

A summary of the principal work done on this subject.

Grehant, N., & Quinquand, E. Mesure du volume de sang contenu dans l'organisme d'un Mammifère vivant. J. de l'Anat. Phys. xviii. p. 564, and C. R. xciv. p. 1450 (abstract).

Gruber, W. Anatomische Notizen. Arch. Anat. Phys. xc. pp. 88–114.

Consists of a series of papers comparing anomalies in the arrangement

of the finger-muscles in Man with that normally found in various other groups of Mammals. [See also Beob. menschl. u. vergl. Anat. iii. p. 1, apud Zool. Anz. vi. p. 81.]

Guérin, J. Sur le caractère physiologique de la contraction tendineuse. C. R. xciv. p. 566.

The author comes to the conclusion that tendons as well as muscles have a power of voluntary contraction.

Hagen, B., & Jentink, F. A. Voorloopige Mededeelingen over de Fauna van Oost Sumatra. Aardrijkskundig Weekblad: 1881, p. 273.

The Mammals recorded by the authors from E. Sumatra are also enumerated in Zool. JB. for 1881, p. 276.

Hagen-Torn, O. Entwickelung und Bau der Synovialmembranen. Arch. mikr. Anat. xxi. p. 591.

On the structure and development of the synovial membrane in *Mammalia*.

Heilprin, A. On the value of the 'Nearctic' as one of the primary Zoological regions. P. Ac. Philad. 1882, p. 316.

Contains deductions based largely on *Mammalia*, and numerous lists of characteristic genera.

Hensel, R. Craniologische Studien. [See *Mustelidæ*.]

Herrmann, —, & Robin, C. Sur l'ossification des cartilages sterno-claviculaires, temporo-maxillaires, et trachéens, comparée a celle du tissu préosseux. J. de l'Anat. Phys. xviii. p. 588.

Hertwig, O. & R. Die Cœlomtheorie, Versuch einer Erklärung des mittleren Keimblattes. Jen. Z. Nat. xv. p. 1, 1882.

——. Die Entwickelung des mittleren Keimblattes der Wirbelthiere. *Op. cit.* xv. p. 286 and xvi. p. 247.

Further researches on the origin and development of the mesoblast.

Heude, —. [See *Cervidæ*.]

Hoernes, R. Säugethierreste aus der Braunkohle von Göriach bei Turnau in Steiermark. JB. geol. Reichsanst. 1882, p. 153, and Verh. geol. Reichsanst. 1882, p. 40.

Remains of 6 species are described, of which 2 are new [see *Felidæ*, *Cervidæ*.]

Hoggan, G. & F. E. On the Comparative Anatomy of the Lymphatics of the Uterus. J. Anat. Phys. xvi. p. 50.

The following are the author's chief results:—In the uterus, the lymphatics are found principally as layers connected with each other, and corresponding to the distinct layers of tissue in the uterus of the lower animals; and in monkeys and man the complex arrangement of the muscular bundles leads to a corresponding irregularity in the arrangement of the lymphatics. The complexity and amount of the lymphatics increase

in proportion to the size of the animals contained in each class. The uterine glands have no connection with the lymphatics.

HUET, M. [See *Procyonidæ*, *Macroscelididæ*.]

IVENS, R. [See CAPELLO, H.]

JENTINK, F. A. [See *Sciuridæ*, *Manidæ*. See also HAGEN, B.]

KAMOCKI, W. Ueber die sogenannte Harder'sche Drüse der Nager. SB. Ak. Crakow, ix. 1882, p. 204, and Arb. k. Univ. Warsaw, viii. p. 1.

Written first in Polish and then in Russian, but criticised in German by Hoyer, Biol. Centralbl. ii. p. 709.

KEANE, A. H. [See TEMPLE, SIR R.]

KLEIN, E. On the Lymphatic System and the minute structure of the Salivary Glands and Pancreas. Q. J. Micr. Sci. xxii. p. 154.

Observed in man, monkey, dog, rabbit, and guinea-pig. [See also *Carnivora*.]

KOBER, J. [See *Talpidæ*.]

KÖLLIKER, A. VON. Die Entwicklung der Keimblätter des Kaninchens; Festschr. zur dritten säcularfeier. Alm. Jul. Maxim. Würzburg, i. p. 1, 1882.

[See *Leporidæ*.]

KÖLLNER, K. Die geologische Entwickelungsgeschichte der Säugethiere. Wien: 1882, 8vo, pp. 98.

[Not seen by Recorder; *cf.* Zool. Anz. v. p. 490, and Arch. f. Nat. xlviii. p. 388.]

KÖPPEN, F. T. Das Fehlen des Eichhörnchens und das Vorhandensein des Rehs und des Edelhirsches in der Krim, nebst Excursen über die Verbreitung einige anderer Säugethiere in Russland. Beitr. Russ. Reiches (2) vi.

This paper contains a most interesting theory in explanation of the fact that the squirrel, beaver, bear, lynx, and several other strictly European animals, are entirely absent from the Crimean forests, although present in those of Southern Russia, which are separated from the Crimea by a considerable space of steppe-land; while the roebuck and red deer are found there as well as in the Caucasus. The author's general conclusions are (1) that the South Russian steppes have never been covered with forests; (2) that the Mammals of the Crimea have entered it, over the frozen Kertch Straits, from the Caucasus range, and not from the Russian mainland; (3) that the Caucasus has received its Mammals, not from European Russia, but from Siberia or Persia, by way of Asia Minor; and (4) that the two streams of animal life from the north and south, on the isthmus between the Black and Caspian Seas, have never met, the South Russian steppes having proved an absolute barrier to all forest forms.

Kořenský, J. O diluvialní faune jeskyňové v okoli Tetínském. SB. böhm. Ges. 1881, p. 395.

On the diluvial cave-fauna of the neighbourhood of Tetin, Bohemia.

Krause, E. [See *Cervidæ*.]

Kühne, W. Beobachtungen zur Anatomie und Physiologie der Retina. Unters. physiol. Inst. Heidelb. iv. p. 280.

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

Kundsin, L. [See *Artiodactyla*.]

Kupffer, C. [See *Muridæ*.]

Lankester, E. R. [See *Trichechidæ*, *Ornithorrhynchidæ*.]

Lataste, F. [See *Muridæ*.]

Laura, J. B. Sur la structure de la moelle épinière. Arch. Ital. Biol. i. p. 147.

Worked out in the calf.

Laver, H. The *Mammalia* of Essex. Tr. Epping Nat. Club, ii. p. 157, 1882.

Lebouco, H. De l'os central du carpe chez les Mammifères. Bull. Ac. Belg. (3) iv. p. 220.

The author believes that all pentadactyle mammals have an os centrale at some period of their existence.

Leche, W. [See *Chiroptera*.]

Legal, E. Die Nasenhöhlen und der Thränennasengang der amnioten Wirbelthiere. iv. Säugethiere. Morph. JB. viii. p. 353.

On the development of the nares and lachrymal canal in the *Mammalia*; worked out on the young of rabbits, rats, and pigs.

Lemoine, —. Sur les mammifères et oiseaux fossiles de la faune Cernaysienne. Bull. Soc. Geol. (3) x. p. 96.

——. Sur l'encéphale de l'*Arctocyon ducilii* et du *Pleuraspidotherium aumonieri*, mammifères de l'éocène inférieur des environs de Reims. Bull. Soc. Geol. (3) x. p. 328; and C. R. xciv. p. 1131.

Lewis, W. B. On the Comparative Structure of the Brain in Rodents Phil. Tr. clxxiii. pp. 699-746, pls. xlix. & l.

A most exhaustive memoir on the minute structure of the brains of the rat and rabbit, with special reference to the histology of the cortex cerebri. [Abstract referred to in Zool. Rec. xviii. *Mamm.* p. 6.]

Leydig, F. Ueber Verbreitung der Thiere im Rhöngebirge und Mainthal, mit Hinblick auf Eifel und Rheinthal. Verh. Ver. Rheinl. xxxviii. p. 43.

Gives notes on the distribution of the common *Mammalia* of the district.

Lieberkühn, N. Ueber die Chorda bei Säugethieren. Arch. Anat. Phys. 1882, p. 399.

Lucae, J. C. G. Der Fuchs-Affe und das Faul-thier (*Lemur macaco* und *Cholopus didactylus*) in ihrem Knochen- und Muskel-skelet. Frankfurt-a-M.: 1882, 4to, 84 pp. and 23 pls.

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

Lütken, C. F. Dyreriget, en Haand og Lærebog til Brug ved højere Læreanstalter. Copenhagen: 1881–82, 8vo.

A text-book of Zoology, illustrated by numerous figures; the Mammals are treated of on pp. 41–171.

Lydekker, R. Notes on some Siwalik and Jamna Mammals. Rec. Geol. Survey Ind. xv. p. 28.

——. Notes on some Siwalik and Narbada Fossils. *Tom. cit.* p. 102.

Notes on some remains of the genera *Hippopotamus* and *Mastodon*, and on some fossils from Perim. [See also *Equidæ*, *Hippopotamidæ*, *Camelopardalidæ*, and *Tragulidæ*.]

Maindron, M. Coup d'œil sur la faune de la Nouvelle-Guinée. Bull. Soc. Zool. 1882, p. 354.

Contains a few unimportant observations on the *Mammalia*.

Mela, A. J. Suomen Luurankoïset, eli luonnontieteellisen suomen luurankois-eläimisto (Vertebrata Fennica, sive fauna animalium vertebratorum regionis Fennicæ naturalis). Helsingissä: 1882, 8vo.

The Mammals are treated of on pp. 1–67. A map is appended, showing the division of Finland into twenty-two natural provinces.

Merriam, C. H. The Vertebrates of the Adirondack Region, North eastern New York. Tr. Linn. Soc. N. Y. i. p. 1, 1882.

Contains full and most interesting accounts of the habits, distribution, &c., of the *Carnivora* of this region.

Mitsukuri, K. On the Development of the suprarenal bodies in *Mammalia*. Q. J. Micr. Sci. xxii. p. 17.

Observed in the rabbit and rat.* The author arrives at the following result:—The two portions of the suprarenal body, the cortical and medullary, are wholly different in their origin, the first arising from the mesoblast, while the latter is derived from the peripheral part of the sympathetic system, and is at first placed outside the cortical substance, becoming transported into the middle of the suprarenal body in the course of development.

Mivart, St. G. [See *Carnivora*, *Hystricidæ*.]

Mojsisovics, A. v. Bemerkungen zur Säugethierfauna von Bellye, Hungary. MT. Ver. Steierm. 1881 [1882], p. 163, and 1882, p. 103.

Müller, A. & K. Thiere der Heimath,—Deutschlands Säugethiere und Vögel. Erstes Buch. Cassel & Berlin: 1882, 8vo, pp. 440.

Contains full and most useful accounts of the habits, breeding, and distribution of the Mammals of Germany.

Nehring, A. [See *Canidæ*, *Phocidæ*, *Equidæ*.]

NEWTON, E. T. Notes on the *Vertebrata* of the Pre-glacial Forest-bed. Series of the East of England. Part IV. *Rodentia* and *Insectivora*, Geol. Mag. (2) viii. p. 256. [One new species, see *Muridæ*.] Part. v. *Proboscidea* and *Cetacea*; tom. cit. p. 315. [*Cf.* Zool. Rec. xvii. *Mamm.* p. 8.]

NICHOLSON, H. A. Synopsis of the Classification of the Animal Kingdom. *Mammalia*, pp. 106–118. Edinburgh: 1882, 8vo.

This work consists of a mere list of names without descriptions.

NINNI, A. P. [See *Rodentia*.]

NUNN, E. On the Development of the Enamel of the Teeth of Vertebrates. P. R. Soc. xxxiv. p. 156.

The following are the author's conclusions:—"(1) The cuticula dentis is formed by the metamorphosis of the enamel cells, which have nothing whatever to do directly with the formation of the enamel. (2) The basement membrane may be demonstrated upon the surface of the tooth papilla and upon the tooth in all stages of development; it becomes calcified with the other hard tissue of the tooth, and cannot be separated by acid. (3) The enamel, like the dentine, owes it origin to the odontoblasts, the processes of which, in an early stage, may be traced quite up to its outer edge." Several drawings of microscopic preparations are appended.

NUSSBAUM, M. Ueber den Bau und die Thätigkeit der Drüsen. Arch. mikr. Anat. xxi. p. 296.

On the structure and functions of the digestive glands.

OWEN, R. [See *Proboscidea*.]

PALADINO, J. Sur les premiers phénomènes du développement de quelques mammifères. Arch. Ital. Biol. ii. p. 363.

PALACKY, J. Zur Fauna Palästina's. SB. böhm. Ges. 1881, p. 58.

Contains some unimportant observations on Mammals.

PARKER, W. N. [See *Tapiridæ*.]

PODWYSSOTZKI, W., JUN. Beiträge zur Kenntniss des feineren Baues der Bauchspeicheldrüse. Arch. mikr. Anat. xxi. p. 765.

On the minute structure of the pancreas.

POMMEROL, F. [See *Bovidæ*.]

POPPE, S. A. Zur Säugethier-Fauna des nordwestlichen Deutschland. Abh. Ver. Brem. vii. p. 301, 1882.

A list, with short notes, of the *Mammalia* found in the district "between Ems and the Elbe." 58 species are enumerated.

POUCHET, G. [See *Balænidæ*.]

QUINQUAND, E. [See GREHANT, N.]

RAUBER, A. Ueber die Endigung sensibler Nerven in Muskel und Sehne. Bischoff's Beitrage zur Biologie, 1882, p. 43.

RAWITZ, B. Ueber den Bau der Spinalganglien. Arch. mikr. Anat. xxi. p. 244.

The microscopic anatomy of the spinal ganglia of Mammals is treated of, pp. 278–288.

REICHEL, P. Beitrag zur Morphologie der Mundhöhlendrüsen der Wirbelthiere. Morph. JB. viii. p. 1.

On the morphology of the glands of the mouth in Vertebrates. The Mammals are treated of on pp. 60–71.

REIN, G. Untersuchungen über die embryonale Entwickelungsgeschichte der Milchdrüse. ii. Arch. mikr. Anat. xxi. p. 678; and Tr. Int. Med. Congr. vii. i. p. 175.

On the fœtal development of the mammary glands.

RENSON, G. De la spermatogenèse chez les Mammifères. Arch. Biol. iii. p. 291.

RETZIUS, G. Ueber ein Blutgefasse führendes Epithelgewebe im membranosen Gehörorgan. Biol. Unters. ii. p. 97, 1882.

——. Zur Histologie der häutigen Gehörschnecke des Kaninchens. Biol. Unters. ii. p. 103.

On the histology of the membranous cochlea of the rabbit.

——. Ueber die Endigungsweise des Gehörnerven in den Maculæ und Crista Acusticæ. Biol. Unters. ii. p. 145, 1882.

A German translation of a paper published in 1871, in Swedish.

RIVIÈRE, E. Le gisement quaternaire de Billancourt. C. R. xcv. p. 391.

Fragments of 8 species of Mammals are referred to.

ROBIN, C. [See *Artiodactyla*.] [See also HERRMANN.]

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

ROCHEBRUNE, A. T. DE. Diagnoses de quelques Mammifères nouveaux ou peu connus propres à la Sénégambie. Bull. Soc. Philom. (6) vii. p. 5.

Consists of most insufficient descriptions of several new species of Mammals, and also of new varieties, to which binomial names are given, of the Dog, Sheep, and Ox. [See *Erinaceidæ*, *Soricidæ*, *Canidæ*, *Myoxidæ*, and *Bovidæ*.]

ROGER, O. Liste der bis jetzt bekannten Säugethiere. CB. Ver. Regensb. 1880, p. 165; 1881, pp. 27, 52, 117 & 162.

The present parts of this paper contain a list of all the known fossil species of *Ungulata* and *Sirenia*. [Not seen by Recorder; *cf.* Zool. JB. iv. p. 279, where the list is reproduced.]

ROMITI, G. Sur l'origine du mésoderme, et ses rapports avec le vitellus. Arch. Ital. Biol. ii. p. 277.

ROSENBERG, C. [See *Edentata*.]

ROSENBERG, H. VON. [See *Primates.*]

ROTHPLETZ, A. Das diluvium um Paris, und seine Stellung im Pleistocän. N. Denk. schw. Ges. 1882.

A discussion, founded largely on *Mammalia*, on the geological position of the Parisian diluvial deposits.

RUTIMEYER, L. [See *Cervidæ.*]

ST. JOHN, C. Natural History and Sport in Morayshire. Edinburgh: 1882, 4to, pp. 324.

Contains numerous observations on the Mammals of the district.

SCHMIDT, M. Die Hausthiere der alten Aegypter; I. & II. Kosmos, xii. pp. 349 & 422.

The present parts of this paper contain an account of the domesticated Ungulates of the Egyptians.

SELENKA, E. [See *Rodentia.*]

SNELLEMAN, J. F. Zoogdieren, in P. J. Veth's "Midden-Sumatra" IV. Natuurlijke Historie, 3de Aflevering, pp. 1-8. Leiden: 1882, 4to.

The present part contains an account of the Anthropoid apes only; the main portion of the work has yet to appear.

STRUCKMANN, C. Ueber die Veränderungen in der geographischen Verbreitung der höheren wildlebenden Thiere im mittleren Europa und speciell in Deutschland seit der älteren Quartärzeit bis zur Gegenwart. Z. wiss. Geogr. iii. pp. 133 & 173.

A paper on the variations in the geographical distribution of Mammals and Birds, within recent geological times; founded chiefly on the evidence of the Bone Caves of Germany.

STOWELL, T. B. [See *Carnivora.*]

TARTUFERI, F. Studio comparativo del tratto ottico e dei corpi geniculati, nell' uomo, nella scimmia, e nei mammiferi inferiore. Mem. Acc. Tor. (2) xxxiv. p. 101.

TEMPLE, SIR R., & KEANE, A. H. Asia: Stanford's Compendium of Geography and Travel. London: 1882, 8vo.

This work contains many references to the *Mammalia* of the countries described, and especially to the domesticated animals.

TESTUT, L. Recherches sur les muscles hyoïdiens chez l'homme et chez les animaux. Ann. Sci. Nat. Bord. i. p. 185.

THOMAS, O. On a small collection of *Mammalia* from Central Mexico. P. Z. S. 1882, p. 371.

16 species are enumerated from the State of Durango; collected by Mr. A. Forrer. [See also *Viverridæ*, *Rodentia.*]

TORCAPEL, A. Sur un gisement de Mammifères tertiaires, à Aubignas (Ardèche). C. R. xciv. p. 1432.

11 species of Mammals are enumerated.

TROUESSART, E. L. Du rôle des courants marins dans la distribution géographique des Mammifères amphibies, et particulièrement des Phoques et des Otaries. Bull. Soc. Angers, xi. p. 21.

A continuation of the paper noticed, Zool. Rec. xviii. *Mamm.* p. 9. [See also *Otariidæ*, *Insectivora*.]

VALENTIN, G. Beiträge zur Kenntniss des Winterschlafs der Murmelthière. Abth. 27. Unters. Naturl. Mensch. xiii. p. 34.

[Not seen by Recorder ; *cf.* Zool. Anz. vi. p. 83.]

VAN BENEDEN, P. J. [See *Cetacea*.]

VAN DYCK, W. On the modification of a race of Syrian Street Dogs, by means of Sexual Selection ; with a preliminary notice by Charles Darwin, F.R.S. P. Z. S. 1882, p. 367.

The native street dogs prefer to mate with strange, visiting dogs, rather than with those of their own breed, and the result is a mongrelization of the race.

VIBERT, M. De la possibilité de distinguer le sang de l'homme de celui des mammifères. Laboratoire d'Histologie du College de France. Travaux, 1882, p. 48.

The author comes to the conclusion (1) that in the case of dried patches of blood it is always impossible to state absolutely that a given stain is that of human blood, but only that it might be ; and (2) that in certain cases a blood-stain might be known for certain to be from a Mammal other than Man.

VIGNAL, W. Recherches sur l'appareil ganglionnaires du cœur des Vertébrés. Lab. d'Histol. Travaux, 1881, pp. 186–249.

Contains observations on the nervous ganglia of the heart of *Macacus*, *Lepus*, and other Mammals. [Omitted from Zool. Rec. xviii.]

VIRCHOW, H. Beiträge zur vergleichenden Anatomie des Auges. Berlin : 1882, 8vo (pp. 99).

[Not seen by Recorder ; *cf.* Zool. Anz. vi. p. 8.] [See also *Rodentia*.]

VOGT, C. [See *Chiroptera*.]

WALLER, C., & BJÖRKMAN, G. Studien über den Bau der Trachealschleimhaut mit besonderer Berücksichtigung des Epithels. Biol. Unters. (Stockholm) ii. p. 71.

On the structure of the mucous membrane of the trachea and bronchi, with especial reference to the epithelium.

WATNEY, H. On the minute anatomy of the Thymus gland. Phil. Tr. clxxiii. p. 1063.

WATSON, M. [See *Hyænidæ*.]

WHITE, E. W. Cameos from the Silver Land, or the Experiences of a Young Naturalist in the Argentine Republic. London : 1881–82, 8vo, 2 vols.

Contains numerous incidental notes on the *Mammalia* of the Republic, although the author's attention was chiefly confined to Birds.

WIEDERSHEIM, R. Zur Palæontologie Nord-Amerikas. Biol. Centralbl. i. p. 359.

Notes on the tertiary Mammals recently discovered by Prof. Marsh.

——. Lehrbuch der vergleichenden Anatomie der Wirbelthiere. Theil 1. Jena: 1882.

This part contains the comparative anatomy of the skin, skeleton, muscles, and nerves of the various groups of *Vertebrata*. [Not seen by Recorder; *cf.* Am. J. Sci. xxiv. p. 478.]

WILDER, B. G., & GAGE, S. H. Anatomical Technology as applied to the domestic Cat: an Introduction to human, veterinary, and comparative Anatomy. New York & Chicago: 1882, 8vo, pp. 575.

This work, written primarily for the use of demonstrators and teachers of anatomy, will in many ways be of great service to all anatomists and physiologists. Like Prof. Mivart, the authors have selected the Cat as a convenient and typical example of a Mammal, and in working out its anatomy they have given, at the same time, full and lucid accounts of the methods and instruments employed for the dissection and preservation of specimens. Special attention is devoted to the viscera and to the brain, of which latter four excellent plates are reproduced from the Proceedings of the American Philosophical Society. There are also a very large number of highly inartistic, but detailed and careful woodcuts, of dissections, bones, instruments, etc. Sweeping, and in some cases, apparently unnecessary changes are proposed in the nomenclature of the various parts of the body, and vernacular names are in all cases discarded and replaced by their Latin equivalents. [See also *Felidæ*.]

WINGE, H. Om Pattedyrenes Tandskifte, især med Hensyn til Tændernes Former. Vid. Medd. 1882, p. 15, pl. iii.

Contains an account of the various forms of teeth found in the different orders of *Mammalia*. A bibliography of the subject is appended.

——. Om nogle Smaapattedyr i Danmark. Vid. Medd. 1882, p. 76.

Consists of tables showing the distribution in Denmark of the various species of *Insectivora* and *Rodentia* found in that country.

WOLDRICH, J. N. Ueber die diluviale Fauna von Zuzlawitz bei Winterberg im Böhmerwalde. SB. Ak. Wien, lxxxiv. i. p. 177.

Contains a full description, accompanied by excellent plates, of the rich fossil remains found at Zuzlawitz, in Bohemia. Nearly 70 different species of *Mammalia* were represented, of which thousands of fragments, more or less complete, were obtained. 2 species are described as new. [See *Canidæ*, *Mustelidæ*.]

YOUNG, A. H. [See *Phalangistidæ*.]

ZABOROWSKI, —. De l'age de la formation pampéenne et de quelques-uns des débris humains que contiennent ses couches. Rev. Sci. xxix. p. 83.

The arguments as to the age of the Pampas formations are largely founded on *Mammalia*.

FAUNÆ.

Africa, S.W. [See Thomas, O., *Rodentia*, p. 27.]
Angola. [See Bocage, J. V. B. du.]
Argentine Republic. [See White, E. W.]
Crimea and *Caucasus.* [See Köppen, F. T.]
Denmark. [See Winge, H.]
Ecuador. [See Pelzeln, A. von.]
Finland. [See Mela, A. J.]
Germany. [See Müller, A. & K., & Poppe, S. A.]
Hungary. [See Mojsisovics, A. von.]
Indian Archipelago. [See Rosenberg, H. von, *Primates*, p. 18.]
Japan. [See Doederlein, L.]
Kamschatka. [See Dybowski, —.]
Madagascar. [See Cowan, W. D.]
Mexico. [See Thomas, O.]
New York, N.E. [See Merriam, C. H.]
Ohio. [See Brayton, A. W.]
Palestine. [See Palacky, J.]
Patagonia. [See Doering, D. A.]
Scandinavia. [See Collett, R.]
Senegambia. [See Rochebrune, A. T. de.]
Sumatra. [See Hagen, B., & Snelleman, J. F.]

PRIMATES.

A full systematic account of the genera of the *Lemuroidea* is given by W. H. Flower, Encyclopædia Britannica, 9th ed., xiv., pp. 440–445, figs. 1–6, Article "Lemur." The arrangement is as follows :—

Fam. 1. *Lemuridæ.*
Sub-fam. 1. *Indrisinæ* .....*Indris, Propithecus, Avahis.*
„ 2. *Lemurinæ*.....*Lemur, Hapalemur, Lepilemur.*
„ 3. *Galaginæ* .....*Chirogalus, Galago.*
„ 4. *Lorisinæ* .....*Loris, Nycticebus, Perodicticus.*
Fam. 2. *Tarsiidæ* .....*Tarsius.*
Fam. 3. *Chiromyidæ*.....*Chiromys.*

The genera and many of the species are characterized, and several of the latter are figured. There is also an account of all the fossil forms as yet discovered.

Férè, C. Contribution à l'étude de la topographie cranio-cérébrale chez quelques Singes. J. de l'Anat. Phys. xviii. p. 545.

Observations on the positions on the brain of the various fissures in numerous monkeys and lemurs.

Placzek, B. Die Affen bei den Hebräern und andern Völkern des Alterthums. Kosmos, xi. pp. 109 & 209, 1882.

Contains notes on the monkeys referred to in the Bible and other early writings.

ROSENBERG, H. VON. Die Affen von Insulinde. Zool. Gart. xxiii. p. 111.

25 species are found in the East Indian Archipelago. Sumatra has 12 indigenous species, Borneo 11, Java 5, Celebes 2, and Bali, Lomboc, Flores, Sumbawa, and Timor 1 each.

SIMIIDÆ.

[See above, SNELLEMAN, J. F.]

DENIKER, J. Sur les singes anthropoides de la Ménagerie Bidel ; Bull. Soc. Zool. 1882, p. 301.

Observations on the appearance and habits of an adult male orang and an immature female chimpanzee.

Troglodytes gorilla. On its skull ; R. Virchow, SB. Ak. Berl. 1882, p. 671. Contains a description, with measurements and figures, of three young skulls.

Troglodytes niger. A young skull from the Soudan described ; W. H. Flower, P. Z. S. 1882, p. 634. This specimen has been affected by "acrocephaly," a disease not hitherto observed in any of the Anthropoid apes.

Simia. On the species of this genus ; F. A. Lucas, P. Bost. Soc. xxii. p. 228. The author considers that *S. wurmbii* and *S. morio* merely represent the aged male and female forms of *S. satyrus* respectively.

CEBIDÆ.

Pithecia satanas. Note on an abnormal specimen ; W. A. Forbes, P. Z. S. 1882, p. 442. A connecting web present between the third and fourth digits of the manus on each side.

LEMURIDÆ.

Lemur niger. On the birth of a young specimen at Hamburg ; M. Schmidt, Zool. Gart. xxiii. p. 161.

Necrolemur edwardsi (foss.). Description of the dentition of its lower jaw ; H. Filhol, Bull. Soc. Philom. (6) vii. p. 13.

CHIROMYIDÆ.

Chiromys madagascariensis. Notes on its habits ; L. Baron, P. Z. S. 1882, p. 639.

CARNIVORA.

ST. G. MIVART (P. Z. S. 1882, p. 135) has worked out the families and genera of the *Æluroidea*. The classification he arrives at is as follows :—

Fam. I. FELIDÆ, with *Felis* and *Cynælurus*.
Fam. II. VIVERRIDÆ.
Sub-fam. 1. VIVERRINÆ, with (*a*) *Viverra*, *Viverricula*, *Fossa*, *Genetta*, *Prionodon*, *Poiana*, (*b*) *Paradoxurus*, *Arctogale*, *Hemigalea*, *Arctictis*, *Nandinia*, and (*c*) *Cynogale*.
„ 2. GALIDICTINÆ. *Galidictis*, *Galidia*, *Hemigalidia*.
„ 3. EUPLERINÆ. *Eupleres*.
„ 4. CRYPTOPROCTINÆ. *Cryptoprocta*.
„ 5. HERPESTINÆ. (*a*) *Herpestes*, *Helogale*, *Cynictis* (*Bdeogale*?), (*Rhinogale*?), and (*b*) *Crossarchus* and *Suricata*.
Fam. III. HYÆNIDÆ.
Sub-fam. 1. PROTELINÆ. *Proteles*.
„ 2. HYÆNINÆ. *Hyæna*, *Crocuta*.

It will thus be seen that the author reduces to the rank of sub-families the families *Cryptoproctidæ* and *Proteleidæ*, allowed by Flower in his paper on the *Carnivora* (P. Z. S. 1869, p. 4). The *Cryptoproctinæ* are placed as one of the five sub-families of the *Viverridæ*, two of which, the *Euplerinæ* and the *Galidictinæ*, are now formed for the first time, and the *Protelinæ* with the *Hyæninæ* together forming the family *Hyænidæ*. Full descriptions and comparative tables of characters are given of the various genera and groups, accompanied by numerous figures of foot-pads, teeth, &c.

In a second paper (P. Z. S. 1882, p. 459) Mivart supplements the first one with notes and descriptions of the osteology and anatomy of the various forms of *Æluroidea*, and gives tables of dimensions of the different bones of their skeletons. The anatomy of *Genetta tigrina*, as a central form, is especially fully worked out.

KLEIN, E. The Organ of Jacobson in the Dog. Q. J. Micr. Sci. xxii. p. 299.

FELIDÆ.

STOWELL, T. B. The Vagus Nerve in the Domestic Cat. P. Am. Phil. Soc. xx p. 123.

The distribution of this nerve is very fully worked out and its course illustrated by figures.

Part ix. of D. G. Elliott's Monograph of the *Felidæ* (cf. Zool. Rec. xv. *Mamm.* p. 4), contains illustrations of *Felis leo*, *scripta*, *lynx*, and *pardina*, and Part x., of *javensis*, *catus*, *jaguarondi*, and *rufa*.

Felis leo. A general account of this animal is given by W. H. Flower, Encycl. Brit. (9th Ed.) xiv. Article "Lion."

Felis domestica. Anatomy of, see *supra*, p. 16, Wilder, B. G., and Gage, S. H. On a mesal cusp on the lower milk canine of this species; B. G. Wilder, P. Am. Ass. 1881, xxx. Cincinnati, p. 242. On its distribution; Langkavel, Die Natur, 1882. p. 611 [*cf.* Zool. Anz. vi. p. 264].

Felis turnauensis, sp. n. (foss.), R. Hoernes, JB. geol. Reichsaust. xxxii. p. 154, 1882, Turnau, Steiermark.

Machærodus jourdani, sp. n. (foss.), H. Filhol [see *supra*, p. 5].

Nimravidæ.

Filhol, H. Observations sur le genre *Proælurus*. Toulouse: 1881, 8vo.

[Not seen by Recorder; *cf.* Zool. JB. Neap. 1881, p. 286.]

Hyænidæ.

Hyænodon laurillardi. Notes on this species; H. Filhol, Bull. Soc. Philom. (7) vi. p. 122.

Hyænodon aymardi, sp. n. (foss.), H. Filhol, Ann. Sci. Géol. xii. p. 48, Ronzon.

Proteles cristatus: on its muscular anatomy; M. Watson, P. Z. S. 1882, p. 579. This paper shows the correctness of Mivart's views as to the relations of *Proteles* (see *suprà*, p. 19), as it is said that "in nearly all important particulars *Proteles* agrees with *Hyæna* and differs from *Viverra*.

Viverridæ.

Morris, D. The Mungoose on Sugar Estates in the West Indies. Kingston, Jamaica: 1882, 8vo.

Thomas, O. On the African Mungooses. P. Z. S. 1882, p. 59.

The author gives full descriptions and synonymy of the 7 genera and 20 species allowed. *Rhinogale melleri*, Gray, is figured (pl. iii.).

Genetta tigrina. On its anatomy; St. G. Mivart, *l. c.*

Plesictis formosus, sp. n. (foss.), H. Filhol, Bull. Soc. Philom. (7) vi. p. 121, Lower Miocene of St. Gerand-le-Puy.

Palæoprinodon mutabilis and *lamandini*, g. & spp. nn. (foss.), H. Filhol, Ann. Soc. Toulouse, 1881. [Not seen by Recorder; *cf.* next reference.]

Palæoprinodon simplex, sp. n. (foss.), H. Filhol, Bull. Soc. Philom. (6) vii. p. 11, Quercy.

Hemigalidia, g. n., St. G. Mivart, P. Z. S. 1882, p. 188. Formed to contain "*Galidia*" *concolor* and *olivacea*; the genus is distinguished by having P.M. $\frac{4}{4}$, *Galidia* having only $\frac{3}{3}$.

Herpestes griseus: on its acclimatization in Jamaica; W. B. Espeut, P. Z. S. 1882, p. 712. The author believes that the introduction by him of this species into Jamaica, with a view to the destruction of the "cane-piece rats," has resulted in a saving to the colony of not less than £150,000 a year in the lessened damage done by the rats to the sugar-canes.

Mungos, Gray, = *Crossarchus*, F. Cuv., which then contains 4 species; O. Thomas, *l. c.*

Canidæ.

Nehring, A. Ueber einige *Canis*-Schädel mit auffälliger Zahn-Formel. SB. nat. Fr. 1882, p. 65.

Gives an account of skulls of *Canidæ* with either more or less pre-

molars and molars than the normal number. One skull is mentioned of a street-dog from Jaffa, which has an additional posterior molar on each side, both above and below, making in all 46, a close approach to the number found in *Otocyon*.

Canis lupus. On its distribution in Asia; Langkavel, Z. wiss. Geogr. iii. p. 220.

Canis dingo. On the convolutions of its cerebellum; N. de Miklouho-Maclay, P. Linn. Soc. N. S. W. vi. p. 624, 1882.

Canis hodophylax. Notes on this species; D. Brauns, Chrysanthemum, i. p. 66, 1881.

Canis familiaris, var. nov. *laobetianus*, A. T. de Rochebrune, Bull. Soc. Philom. (6) vii. p. 9, Senegambia.

Canis hercynicus, sp. n. (foss.), Woldrich, SB. Ak. Wien, lxxxiv. i. p. 246.

Canis microtis, sp. n., P. L. Sclater, P. Z. S. 1882, p. 631, Amazons.

Vulpes edwardsi, sp. n., A. T. de Rochebrune, Bull. Soc. Philom. (6) vii. p. 8, Senegambia.

Amphicyon ambiguus, var. n. *brevis*, H. Filhol, Bull. Soc. Philom. (6) vii. p. 15, Quercy.

Cynodon aymardi, sp. n. (foss.), *id. l. c.* p. 12, Quercy.

Procyonidæ.

Procyon lotor: on the muscles of its limbs; H. Allen, P. Ac. Philad. 1882, p. 115. Compares the myology of this animal with that of *Felis domestica*.

Bassaricyon: note on the species of this genus; M. Huet, N. Arch. Mus. (2) v. p. 1, 1882. The author is inclined to consider *B. alleni* as a synonym of *B. gabbi*; and, furthermore, influenced by the external resemblance of these animals to the Kinkajon, he would reduce Allen's distinct genus to the position of a subgenus of *Cercoleptes*.

Mustelidæ.

Mustela: on the skulls of the species of this genus; R. Hensel, Nova Acta Ac. L.-C. Nat. Cur. xlii. p. 127 [1881]. A most important contribution to our knowledge of the variations to which the skulls of these animals are subject. The author gives descriptions, measurements, and excellent figures of large series of each species, and shows what differences are due to age, sex, &c., and what to specific distinctness.

Mustela nigripes recorded from Texas; E. Coues, Am. Nat. xvi. p. 1009.

Mustela krejcii, sp. n. (foss.), Woldrich, SB. Ak. Wien, lxxxiv. i. p. 201.

Lyncodon patagonicus. This rare animal was obtained in the interior of Northern Patagonia, and is shortly described by A. Doering (see *suprà*, p. 6).

Meles taxus: its past and present distribution in Scotland; J. A. Harvie Brown, Zool. (3), vi. p. 1.

Mephitis interrupta is found in North Carolina; A. G. Wetherby, Am. Nat. xvi. p. 736.

Lutra vulgaris: on its breeding habits; A. H. Cocks, Zool. (3) vi. p. 201. The period of gestation is about sixty days.

Lutra lonteti, sp. n. (foss.), H. Filhol [see *suprà*, p. 6].

Ursidæ.

Ursus. On a hybrid between a male *U. maritimus* and a female *U. arctos*; P. L. Martin, Zool. Gart. xxiii. p. 370.

Ursus amplidens. Remarks on this fossil species; J. Wortman, P. Ac. Philad. 1882, p. 286. Probably specifically identical with *U. ferox*.

Ursus spelæus. On remains found at Presles, Isère; Lory, Bull. Soc. Géol. (3) x. p. 348. And in the Dachstein district; F. Kraus, JB. geol. Reichsanst. xxxi. p. 529, pl. xi.

Otariidæ.

Trouessart, E. L. La pêche des Otaries aux îles Prybilov. Rev. Sci. xxx. p. 782.

A popular account, compiled from the writings of Messrs. Allen and Elliott, of the Prybilov Island seal fisheries.

Otaria jubata. On the anatomy of a fœtal specimen; L. Camerano, Arch. Ital. Biol. ii. p. 285. (See also Mem. Acc. Tor. xxxv.)

Otaria gillespii (*Zalophus californianus*, Allen). Notes on the external characters and anatomy of a male specimen of this species; W. A. Forbes, Tr. Z. S. xi. p. 225. Compares the anatomy with that of *O. jubata*, as described by Murie.

Callorhinus ursinus. On the habits and manner of capture of this species; see *suprà*, H. W. Elliott, p. 6.

Trichechidæ.

Bergonzini, C. Sopra un cranio di *Odobænus rosmarus*. Modena: 1882, 8vo. pp. 17.

[Not seen by Recorder; *cf.* Zool. Anz. v. p. 512.]

Trichechus huxleyi. On tusks of this fossil species from the Red Crag of Suffolk; E. R. Lankester, Tr. L. S. (2) ii. p. 213. The species was originally described by the author as *Trichechodon huxleyi*, but this generic name should now be abolished as synonymous with *Trichechus*.

Phocidæ.

On the species of *Phocidæ* that occur in the Baltic; E. Friedel, Zool. Gart. xxiii. p. 175.

Halichœrus gryphus. On its anatomy and cranial characters; A. Nehring, SB. nat. Fr. 1882, p. 117. Occurrence on the coast of Norfolk; T. Southwell, Zool. (3) vi. p. 187.

CREODONTA.

Leptictidæ.

Triisodon conidens, Cope. Description of remains; E. D. Cope, P. Ac. Philad. 1882, p. 297.

Mioclænus protogonioides, *opisthacus*, and *baldwini*, spp. nn., *id.* Am. Nat. xvi. p. 833, Puerco beds of New Mexico.

Lipodectres penetrans = *Deltatherium fundaminis*, id. *l. c.* p. 522.

Didelphodus, g. n., *id. ibid.* Formed for *Deltatherium absaroke*.

Oxyænidæ.

Oxyæna. On its limb-bones; E. D. Cope, Am. Nat. xvi. p. 334.

Oxyæna gallix, sp. n. (foss.), H. Filhol, Bull. Soc. Philom. (7) vi. p. 120. Upper Eocene of Quercy. The first recorded occurrence of this North American genus in the Old World.

Mesonychidæ.

Mesonyx. Notes on its limb-bones; E. D. Cope, Am. Nat. xvi. p. 334

Dissacus carnifex, sp. n., *id. l. c.* p. 834, New Mexico.

CHIROPTERA.

W. Leche has described the milk dentition of certain members of this Order (Am. Nat. xvi. p. 910). The formula of the milk-teeth of the *Vespertiliones* was—D. I. $\frac{2-2}{3-3}$, D.C. $\frac{1-1}{1-1}$, D.M. $\frac{2-2}{2-2}$. In *Sturnira*, the third lower incisor was wanting. In *Rhinolophus*, the milk-teeth never break through the jaw, but remain concealed until reabsorbed. Of these hidden teeth, there could only be found—D.C. $\frac{1-1}{2}$, D.M. $\frac{2-2}{2-2}$.

Allen, H. On the Ethmoid Bone in Bats. See *supra*, p. 1.

Dobson, G. E. On the Phalanx missing from certain digits in the manus of *Chiroptera*. J. Anat. Phys. xvi. p. 200.

The author shows that it is really the third phalanx, as stated by Flower and other authors, and not the second, as recently suggested by F. A. Dixie, that is missing from the digits of the manus of certain *Chiroptera*.

Petenyi, S. J. Chiroptera hungarica carnivora. Term. füzetek, iv. p. 329.

[Not seen by Recorder; *cf.* Zool. Anz. vi. p. 82.]

Robin, H. A. Recherches anatomiques sur les Mammifères de l'Ordre des Chiroptères. Ann. Sci. Nat. (6) xii. 1881, Art. 2, pp. 180.

A most important account of the anatomy of this order, with especial reference to those parts which are not affected by the possession of the

power of flight. Full accounts are given of the digestive, respiratory and urino-genital systems. The author's general conclusions are, that the divisions used by Dobson are, on the whole, supported by the anatomical facts; but that he would be inclined to unite the two families *Nycteridæ* and *Rhinolophidæ*, to subdivide the *Emballonuridæ*, and to form a new family for *Harpyia* distinct from the *Pteropodidæ*. The paper is illustrated with 8 excellent anatomical plates. (See also Rev. Sci. xxix. p. 507.)

——. Sur les enveloppes fœtales des Chiroptères de la famille des Phyllostomides. C. R. xcv. p. 1377.

Observations on embryos of *Artibeus perspicillatus*, *Macrotus waterhousii*, and *Desmodus rufus*.

Vogt, C. Recherches sur l'embryogénie des Chauves-souris. C. R. Assoc. Franç. 1881, p. 655 [pub. 1882].

Pteropodidæ.

Pteropus phæocephalus and *breviceps*, spp. nn., O. Thomas, P. Z. S. 1882, p. 755, pls. liv. & lv., Caroline Islands.

Cynopterus montani, sp. n., H. A. Robin, Ann. Sci. Nat. (6) xiii. Art. 2, and Bibl. École Hautes Ét. xxvi. p. 1, pl. i., Kessang, Malacca.

Rhinolophidæ.

Rhinolophus hipposideros. On its occurrence in Yorkshire; W. D. Roebuck, Yorksh. Nat. vii. 1882, p. 166 (*cf.* Zool. Anz. v. p. 512).

Phyllorrhina tridens, var. n. *murraiana*, J. Anderson, Cat. Mamm. Ind. Mus. p. 113, Karachi and Bushire.

Nycteridæ.

Nycteris revoili, sp. n., H. A. Robin, Ann. Sci. Nat. (6) xiii. Art. 2, and Bibl. École Hautes Ét. xxvi. p. 3, Somali-land.

Vespertilionidæ.

Vespertilio dobsoni, sp. n., J. Anderson, Cat. Mamm. Ind. Mus. p. 143, Purneah, Bengal.

Phyllostomatidæ.

Sphæronycteris, g. n., Peters, SB. Ak. Berl. 1882, p. 987. Allied to *Ametrida*, Gray, but differs by the lesser development and different shape of the nose-leaf, by the far shorter palate, which ends opposite the second molar, and by other lesser characters. *S. toxophyllum*, sp. n., *id. l. c.* p. 989, pl. xvi., Tropical America.

INSECTIVORA.

Dobson, G. E. A Monograph of the *Insectivora*, systematic and anatomical. Part I. including the Families *Erinaceidæ*, *Centetidæ*, and *Solenodontidæ*. 1882.

This, perhaps the most important work that has appeared during the past year, is designed to be a complete natural history of the whole order *Insectivora*. Not only is the systematic part fully worked out, with synopses, descriptions, and synonymies of the species, but the anatomy of every form obtainable is examined and described, special attention being paid to the myology.

The general arrangement put forward by the author is as follows :—

Suborder I. *Dermoptera*.
  Fam. I. *Galeopithecidæ*.
Sub-order II. *Bestiæ* (*Insectivora vera*).
  Group I.
    Super-fam. *Tupaioidea*.
      Fam. II. *Tupaiidæ*.
      Fam. III. *Macroscelididæ* : *Macroscelidinæ*, *Rhynchocyoninæ*.
    Super-fam. *Erinaceoidea*.
      Fam. IV. *Erinaceidæ* : *Erinaceinæ*, *Gymnurinæ*.
    Super-fam. *Soricoidea*.
      Fam. V. *Talpidæ* : *Myogalinæ*, *Talpinæ*.
      Fam. VI. *Soricidæ*.
  Group II.
    Super-fam. *Centetoidea*.
      Fam. VII. *Centetidæ* : *Oryzorictinæ*, *Centetinæ*.
      Fam. VIII. *Solenodontidæ*.
      Fam. IX. *Potamogalidæ* : *Geogalinæ*, *Potamogalinæ*.
    Super-fam. *Chrysochloridea*.
      Fam. X. *Chrysochloridæ*.

These groups are not treated of in the above order, but the *Erinaceidæ* are taken as typical of the first group of *Insectivora vera*, and the *Centetidæ* and *Solenodontidæ* of the second. The anatomy of other groups to follow will thus be easily comparable with that of one or the other of these representative families. One species is described as new, and a second one has its "nomen nudum" confirmed by a proper description (see *Erinaceidæ*). The part is illustrated with 7 anatomical plates drawn by the author.

Trouessart, E. L. La distribution géographique, la classification et les affinités des mammifères insectivores. Rev. Sci. xxx. p. 513.

An exposition of the recent work on this Order, done by the Author, Mivart, Gill, Cope, Dobson, and others.

Macroscelididæ.

Macroscelides. Notes on the species of this genus; Huet, in Revoil's Faune et Flore des Pays Çomalis. Contains further notes on *M. revoili*, Huet, and descriptions of the other species of the genus.

Erinaceidæ.

Erinaceus adansoni, sp. n., A. T. de Rochebrune, Bull. Soc. Philom. (6) vii. p. 7, Senegambia.

Erinaceus fallax, sp. n., G. E. Dobson, Insectivora, p. 9, Africa, North of the Sahara. *E. deserti*, Loche; Dobson, *tom. cit.* p. 12, is now described for the first time.

Hylomys, Müll. & Schleg., = *Gymnura*, Horsf. & Vig., and the two so-called species *H. suillus* and *H. peguensis* should be united under the name *Gymnura suilla*; Dobson, *tom. cit.* p. 5.

Talpidæ.

Talpa europea. An exhaustive account of the anatomy of the brain of this species, with figures, is given by S. Ganser, Morph. JB. vii. p. 591, 1882; and of its habits, development, and external, skeletal, and anatomical characters, by J. Kober, Verh. Nat. Ges. Basel, vii. p. 62.

Soricidæ.

Crocidura beddomii, sp. n., J. Anderson, Cat. Mamm. Ind. Mus. p. 179, Southern India.

Crossopus nasutus, sp. n., A. T. de Rochebrune, Bull. Soc. Philom. (6) vii. p. 7, Senegambia.

Centetidæ.

Oryzorictes tetradactylus, sp. n., Milne-Edwards & Grandidier, Le Nat. iv. p. 55, "Plateau d'Emirne," Madagascar.

Microgale, g. n., O. Thomas, J. L. S. xvi. p. 319. Allied to *Geogale* and *Oryzorictes*. Clavicles well-developed; tibiæ and fibulæ anchylosed together for their distal halves; ears large; toes 5-5, not fossorial; tail well-developed. *M. longicaudata* and *M. cowani*, spp. nn., *id. l. c.* p. 320, Eastern Betsileo, Madagascar.

Microgale longicaudata. On its anatomy: G. E. Dobson, J. Anat. Phys. xvi. p. 355. This animal is most nearly allied to *Oryzorictes*, with which it forms a special sub-family of the *Centetidæ*.

Solenodontidæ.

Solenodon cubanus. The anatomy of this rare animal is fully worked out by Dobson, *tom. cit.* p. 91. The author considers it so distinct from *Centetes* as to necessitate the formation of a family *Solenodontidæ* for the genus *Solenodon*.

TILLODONTA.

Psittacotherium, g. n., E. D. Cope, Am. Nat. xvi. p. 156; *P. multifragum*, sp. n., *id. l. c.*, New Mexico; [*cf.* Zool. Rec. xviii. *Mamm.* p. 29.]

TÆNIODONTA.

Cope, E. D. On the characters of the *Tæniodonta*. Am. Nat. xvi. p. 72.

The author divides this suborder into the *Ectoganidæ* and the *Calamodontidæ*, and discusses the characters of *Esthonyx*, *Tillotherium*, and *Calamodon*.

Hemiganus vultuosus, g. & sp. nn., E. D. Cope, Am. Nat. xvi. p. 831, New Mexico. Allied to *Calamodon*.

RODENTIA.

On the brain of Rodents; see *suprà*, W. B. Lewis, p. 10.

Ninni, A. P. Forme inedite o poco noto di Rosicante Veneti. Atti Ist. Venet. (5) viii. p. 571.

Contains notes on some of the rarer rodents of Venice.

Selenka, E. Keimblätter und Gastrulaform der Maus. Biol. Centralbl. ii. p. 550.

Thomas, O. On a collection of Rodents from North Peru. P. Z. S. 1882, p. 98.

13 species are recorded, of most of which full descriptions are given. 3 are new to science. [See *Muridæ*.]

——. On a small collection of Rodents from South-Western Africa. P. Z. S. 1882, p. 265.

10 species, of which 1 is new (see *Muridæ*). The collection was made by the late Mr. C. J. Andersson in Damara-land and the neighbouring countries.

Virchow, H. Ueber die Gefässe der Chorioidea des Kaninchens. Verh. Phys. Med. Ges. Würzb. xvi. p. 25.

Contains a description, with figures, of the arteries and veins of the choroid coat of the eye of the Rabbit.

Sciuridæ.

F. A. Jentink monographs the African members of this family (Notes Leyd. Mus. iv. p. 1). He reduces the number of allowable species to 19, of which 16 are referred to *Sciurus*, and 3 to *Xerus*. The specimens in all the principal museums in Europe have been examined, and the results are therefore proportionately trustworthy. Full descriptions and synonymy are given, with lists of the specimens preserved in the Leyden Museum.

Trouessart, E. L. A translation of this author's recent "Revision of the *Sciuridæ*" (*cf.* Zool. Rec. xvii. *Mamm.* p. 22), is given by E. Coues, Bull. U. S. Geol. Surv. vi. p. 301.

Sciurus vulgaris. On its South Russian distribution. See *suprà*, F. T. Köppen, p. 9.

Spermophilus. On the occurrence of this genus beneath the glacial till of Norfolk; E. T. Newton, Geol. Mag. (2) ix. p. 51.

Spermophilus rufescens is the species to which the numerous fossil fragments from Germany, hitherto determined as *S. altaicus*, should be referred; W. Blasius, Zool. Anz. v. p. 610.

Arctomys marmotta. On its winter sleep (see Valentin, G.), *suprà*, p. 15.

Castoridæ.

Collett, R. Om Bæveren [*Castor fiber*], og dens Udbredelse i Norge fordum og nu. N. Mag. Naturv. xxviii. p. 11.

[A separate copy only seen.]

Hamel, E. de. Notes on Beavers and the Bute Beavery. Midl. Nat. v. pp. 100 & 161.

Myoxidæ.

Graphiurus hueti, sp. n., A. T. de Rochebrune, Bull. Soc. Philom. (6) vii. p. 8, Senegambia.

Muscardinus avellanarius. A. Rabus's article on the hybernation of this species [*cf.* Zool. Rec. xviii. *Mamm.* p. 27] is translated in Zool. (3) vi. p. 161.

Muridæ.

Sminthus vagus is found in Denmark, near Kolding; a specimen having been taken from the crop of an owl. H. Winge, Vid. Medd. 1882, p. 76.

Gerbillinæ. Notes on the species of this group; F. Lataste, Le Nat. iv. pp. 12, 21, 27, 36, 69, 77, 83, 100, 101, 107, 117, & 126. The author divides the subfamily (p. 126) into the 2 genera *Gerbillus* and *Meriones*, the former with 5 subgenera, viz., *Pachyuromys*, *Gerbillus*, s. s., *Tatera*, subg. n. ("Nom euphonique, sans étymologie"), (*H.*) *Endecapleura*, subg. n., and *Dipodillus*; the latter with 2, *Rhombomys* and *Meriones*.

Gerbillus hirtipes, sp. n., F. Lataste, Le Nat. iv. p. 21, Wargla, Algeria. *G. quadrimaculatus*, p. 27, Nubia, *G. bottæ*, p. 36, Sennaar, *id. l. c.*

Meriones trouessarti, sp. n., F. Lataste, Le Nat. iv. p. 69, Wed-Magra, Algeria. *M. auziensis*, p. 77, Aumale, Algeria, *M. gætulus*, p. 83, Algeria (withdrawn, as synonymous with *M. erythrurus*, Gr., p. 127), *M. albipes*, p. 101, M'sila, Algeria, *id. l. c.*

Pachyuromys duprasi. On its "bouchon vaginale," F. Lataste, Zool. Anz. v. pp. 235 & 238, and Héron-Royer, *tom. cit.* pp. 453 & 469. On its habits, &c.; F. Lataste, La Nature, x. (2) p. 113.

Amphiaulacomys, g. n., F. Lataste, Le Nat. iv. p. 11. Withdrawn, as synonymous with *Rhombomys*; id. *l. c.* p. 127.

Mus rattus. A. P. Ninni discusses the characters that separate *M. alexandrinus* from this animal, and decides that there is only one species, with three varieties, one being *M. rattus*, var. n. *intermedius*; Atti Ist. Venet. (5) viii. p. 571.

Mus musculus. On its early development; see *suprà*, Selenka (p. 27).

Mus sylvaticus. On its breeding habits; R. M. Barrington, Zool. (3) vi. p. 121. The period of gestation is about three weeks.

Mus edwardsi, sp. n., O. Thomas, P. Z. S. 1882, p. 387, pl. xliv., Western Fo-kien, China.

Mus nigricauda, sp. n., *id. l. c.* p. 266, pl. xiv., Damara-land.

Mus tompsoni, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. vi. p. 763, New South Wales.

Mus salamonis, sp. n., *id. op. cit.* vii. p. 43, Ugi, Solomon Islands.

Mus velutinus, sp. n., O. Thomas, Ann. N. H. (5) ix. p. 415, Tasmania.

Mastacomys, g. n., *id. l. c.* p. 413. Like *Mus*, but with greatly broadened molars and fewer mammæ. *M. fuscus*, sp. n., *id. ibid.*, Tasmania.

Hesperomys spinosus, *cinereus* (pl. iv.), and *taczanowskii*, spp. nn., O. Thomas, P. Z. S. 1882, pp. 105, 108 & 109, N. Peru.

Arvicola. On the French species of this genus; E. L. Trouessart, Feuill. Nat. xiii. [A separate copy only seen.]

Arvicola terrestris. Note on the habits of this species or variety; E. L. Trouessart, Le Nat. iv. p. 24.

Arvicola intermedius, sp. n. (foss.), E. T. Newton, Geol. Mag. (2) viii. [1881] p. 258, Forest-beds of the east of England.

Arvicola arvalis. On its fœtal development; C. Kupffer, SB. bayer. Ak. xii. p. 621.

Arvicola subterraneus and *savii.* Notes on Venetian specimens; A. P. Ninni, Atti Ist. Venet. (5) viii. p. 571.

Dipodidæ.

A popular account of this family is given by F. Lataste, La Nature, x. (1) p. 246.

Dobson, G. E. On the Natural position of the Family *Dipodidæ*. P. Z. S. 1882, p. 640.

The author would place this family among the *Hystricomorpha*, mainly on account of the united condition of the tendons of the flexores digitorum tibialis and fibularis.

Hystricidæ.

Hystrix cristata. On its former existence near Venice; A. P. Ninni, Atti Ist. Venet. (5) viii. p. 588.

Erethizon dorsatus. Description of its anatomy: St. G. Mivart, P. Z. S. 1882, p. 271.

Caviidæ.

Cavia aperea. Note on the breeding of this animal in a state of semi-freedom; N. Masson, Bull. Soc. Acclim. ix. p. 464.

Leporidæ.

Lepus cuniculus. On the vessels of its choroid; see H. Virchow [*suprà*, p. 27]. On the development of its fœtal envelopes; see A. Kölliker [*suprà*, p. 9].

Lepus variabilis. A certain amount of seasonal change of colour noticed in Irish specimens; Lord Clermont, Zoologist (3) vi. p. 107.

Lepus sylvaticus. On its habits; S. Lockwood, Am. Nat. xvi. pp. 854 & 937.

Lagomyidæ.

Lagomys litoralis, sp. n., W. Peters, SB. nat. Fr. 1882, p. 55, Land of the Chuk-chi.

DINOCERATA.

Uintatheriidæ.

Uintatherium robustum, Leidy. Description of a fragmentary lower jaw of this species; E. D. Cope, P. Ac. Philad. 1882, p. 295.

Loxolophodon cornutus. A restoration of the skeleton of this animal from the Bridger Eocene of Wyoming is given by E. D. Cope, Am. Nat. xvi. pl. xvii.

PROBOSCIDEA.

Elephantidæ.

Gaudry, A. Sur des débris de Mammouth trouvés dans l'enceinte de Paris. C. R. xciv. p. 1682. [See also Le Nat. iv. p. 156.]

Elephas primigenius. On a tooth found at Mondonbleau, Loir-et-Cher; Mengy, Bull. Soc. Géol. (3) x. p. 47.

On the name Mammoth; H. H. Howorth, Field Naturalist, i. p. 30. Notes on the origin and various forms of this name.

Notelephas australis, g. & sp. nn. (foss.); R. Owen, Phil. Tr. clxxiii. p. 777. [Abstract in P. R. Soc. xxxiii. p. 448.] Founded on a portion of a tusk from a superficial drift-deposit on Darling Downs, Queensland. The first recorded occurrence of the order *Proboscidea* in Australia.

PERISSODACTYLA.

Cope, E. D. On the *Condylarthra*; P. Ac. Philad. 1882, p. 95, and Am. Nat. xvi. p. 334.

This group is divided into (1) the *Phenacodontidæ*, with the following 8 genera—*Anacodon*, *Phenacodus*, *Protogonia*, *Pantolambda*, *Catathlæus*, *Anisonchus*, *Haploconus*, and *Periptychus*; and (2) the *Meniscotheriidæ* (fam. nov.), including only *Meniscotherium*. A synopsis of the genera is appended. [*Cf.* Zool. Rec. xviii. *Mamm.* p. 22.]

In a second paper (Am. Nat. xvi. p 832), Prof. Cope separates the genera *Periptychus* (= *Catathlæus*), *Anisonchus*, and *Haploconus*, from the *Phenacodontidæ*, and forms for them a new family, the *Periptychidæ*.

Lophiodontidæ.

Heptodon, g. n. (foss.), Cope, Am. Nat. xvi. p. 1029, includes the species referred by the author to the genus *Pachynolophus*, now stated to be equivalent to *Propalæotherium*.

Hyracodontotherium crassum, sp. n. (foss.), H. Filhol, Bull. Soc. Philom. (7) vi. p. 125.

Rhinocerotidæ.

Orthocynodon antiquus, g. & sp. nn. (foss.), from the Bridger Eocene; W. B. Scott & H. F. Osborn, Am. J. Sci. (3) xxiv. p. 223. "An Eocene perissodactyle Ungulate, with the premolar-molar dentition of a Rhinoceros, and somewhat resembling *Amynodon* in the possession of canines and loss of the median incisors."

Tapiridæ.

Capellini, G. Resti di Tapiro nella lignite di Sarzanello. Atti Acc. Rom. ix. p. 76, 1881.

The teeth of a species allied to *Tapirus hungaricus*, Meyer, described and figured.

Tapirus indicus. Notes on its anatomy; W. N. Parker, P. Z. S. 1882, p. 768, pls. lviii. & lix.

Elasmognathus dowi. A Tapir, believed to be of this species, figured; P. L. Sclater, P. Z. S. 1882, p. 391, pl. xxiii.

Chalicotheriidæ.

Ectocion, g. n. (foss.), E. D. Cope, Am. Nat. xvi. p. 522. Formed for *Oligotomus osbornianus*. "If it is not condylarthrous, it must be placed in the *Chalicotheriida*, as the most primitive form."

Palæotheriidæ.

Hippotherium montezuma, sp. n. (foss.), J. Leidy, P. Ac. Philad. 1882, p. 290, Panama.

Equidæ.

Adam, P. Vorträge über Pferdekunde. Stuttgart: 1882, 8vo, pp. 112.

[Not seen by Recorder; *cf.* Zool. Anz. v. p. 510.]

Franck, L. [See *suprà*, p. 7.]

Lydekker, R. Siwalik and Narbada *Equidæ*. Pal. Ind. (10) ii. pt. 3.

An important memoir, in which the synonymy and distribution of the

species, both recent and fossil, of the genera *Hippotherium* and *Equus* are given, and the fossil remains of these genera found in India are full-figured and described.

MAREY, —. Tableau mobile des différentes attitudes du cheval à une allure quelconque. C. R. xciv. p. 1683.

NEHRING, A. Ueber den sogenannten Wolfszahn der Pferde, im Hinblick auf den genealogischen Zusammenhang der fossilen und lebenden Equiden. SB. nat. Fr. 1882, pp. 31 & 47.

The author shows that, in many of the *Equidæ*, the "wolf-tooth," a milk-tooth between the canine and first permanent pre-molar, persists until maturity in a very considerable proportion of cases, and discusses the bearing that the presence or absence of this tooth has on the relation of *Equus* to *Anchitherium* and *Hipparion*.

——. Ueber Ulna und Fibula der Equiden. SB. nat. Fr. 1882, p. 50.

Traces the gradual reduction in the size and importance of these bones from the time of *Anchitherium* to the present day. (See also Journ. Sci. iv. p. 467, 1882.)

POUCHET, G. Sur quelques particularités offertes par le plasma du sang de cheval. J. de l'Anat. Phys. xviii. p. 313.

Equus caballus. On its anatomy. [See L. FRANCK, *suprà*, p. 7.]

Equus hemionus. On remains of this species from Western Germany; A. Nehring, SB. nat. Fr. 1882, p. 53.

Equus grevyi, sp. n. (Milne-Edwards), E. Oustalet, La Nature, x. (2) p. 12, Galla Country. Remarks on this species, with figures; P. L. Sclater, P. Z. S. 1882, p. 721.

Equus lundii, sp. n. (foss.), J. E. V. Boas, Vidensk. Selsk. Skr. (6) i. p. 307, 1881, Brazil.

Hippidion. Remarks on this genus; *id. l. c.*

CORYPHODONTIDÆ.

Bathmodon pachypus, sp. n. (foss.), E. D. Cope, P. Ac. Philad. 1882, p. 294, Wasatch Beds of the Big Horn River.

(CONDYLARTHRA.)

PHENACODONTIDÆ.

Diacodexis, g. n. (foss.), E. D. Cope, Am. Nat. xvi. p. 1029. A new genus, formed for the reception of the animal formerly described under the name of *Phenacodus laticuneus*.

Pantolambda bathmodon, g. & sp. nn. (foss.), *id. l. c.* p. 418, Puerco formation of N.W. New Mexico.

Protogonia plicifera, sp. n. (foss.), *id. l. c.* p. 833, New Mexico.

PERIPTYCHIDÆ.

Hemithlæus kowaleskianus, g. & sp. nn. (foss.), E. D. Cope, Am. Nat. xvi. p. 832, New Mexico.

Anisonchus coniferus, sp. n. (foss.), *id. ibid.*, New Mexico.

Haploconus lineatus, g. & sp. nn., *id. l. c.* p. 417; allied to *Anisonchus* and *Catathlæus*. *H. entoconus* and *gillianus*, spp. nn., *id. tom. cit.* p. 686. All fossil, from New Mexico.

ARTIODACTYLA.

ROBIN, C., & HERRMANN, —. Mémoire sur la génération et la regénération de l'os des cornes caduques et persistantes des Ruminants. J. de l'Anat. Phys. xviii. p. 205, & C. R. xciv. p. 617 (abstract).

KUNDSIN, L. Ueber die Entwickelung des Hornhufes bei einigen Ungulaten. Inaug.-Diss. Dorpat: 1882, 8vo, pp. 74.

[Not seen by Recorder; *cf.* Zool. Anz. v. p. 490.]

ANOPLOTHERIIDÆ.

COPE, E. D. The oldest Artiodactyle. Am. Nat. xvi. p. 71.

Notes on the tarsus of *Mioclænus* and *Dichobune*.

Amphimæryx parvulus, sp. n. (foss.), H. Filhol, Bull. Soc. Philom. (7) vi. p. 126, Quercy.

Myxocherus primævus, g. & sp. nn., *id. l. c.* p. 125, Quercy. Allied to *Diplobune*.

ANTHRACOTHERIIDÆ.

Mouillacitherium parvulum, g. & sp. nn. (foss.), H. Filhol, Le Nat. iv. p. 42, & C. R. xciv. p. 139, Mouillac. Allied to *Cænotherium*.

Bachitherium, g. n. (foss.), H. Filhol, Le Nat. iv. p. 42, and C. R. xciv. p. 138, Quercy. Allied to *Gelocus*. For *B. insigne*, *medium*, and *minus*, spp. nn., *id. l. c.*

SUIDÆ.

FILHOL, H. Observations relatives à un groupe de Suidés fossiles dont la dentition possède quelques caractères simiens. C. R. xciv. p. 1258.

The author considers that the "Pachysimiens," a group of *Suidæ*, found fossil in the Upper Eocene at Quercy, present such simian characters as to have been possibly the ancestors of the recent Primates.

Sus valentini, sp. n. (foss.), H. Filhol, Bull. Soc. Philom. (7) vi. p. 123, St. Gaudens.

Porcula salvania, Hodgs. Figure of, with notes on its habits; P. L. Sclater, P. Z. S. 1882, p. 546, pl. xxxvii.

Platygonus vetus, sp. n. (foss.), J. Leidy, P. Ac. Philad. 1882, p. 301, Pennsylvania.

Hippopotamidæ.

Albrecht, P. Note sur un sixième costoïde cervical chez un jeune *Hippopotamus amphibius*. Bull. Mus. Belg. i. p. 197, pl. xi.

Hippopotamus. Falconer's sub-genera *Hexaprotodon* and *Tetraprotodon* must be abolished, their distinctive characters having been found in a single species; R. Lydekker, Rec. Geol. Surv. Ind. xv. p. 103, 1882.

Hippopotamus amphibius. On the habits, &c., of a young male specimen in the Hamburg Zoological Gardens; W. L. Sigel, Zool. Gart. xxiii. pp. 129 & 289.

Bovidæ.

Pommerol, F. Recherches sur le Mouflon quaternaire (*Ovis antiqua*). C. R. Ass. Franç., Alger: 1881. Paris: 1882, 8vo, pp. 525–530, figs. 68–71.

Further material corroborates the specific difference of this fossil sheep from the existing Mouflon; its head was of enormous weight, with very large horns in the male.

Bos taurus, varr. nn. *triceros* and *harveyi*, A. T. de Rochebrune, Bull. Soc. Philom. (6) vii. p. 10, Senegambia.

Bibos frontalis and young, figured; P. L. Sclater, P. Z. S. 1882, p. 233, pl. x.

Tragelaphus gratus. Description of the male of this species; A. T. de Rochebrune, Bull. Soc. Philom. (6) vii. p. 9.

Oreas colini, sp. n., A. T. de Rochebrune, Bull. Soc. Philom. (6) vii. p. 8, Senegambia.

Ovis aries, varr. nn. *bakelensis* and *djalonensis*, *id. l. c.* pp. 10 & 11, Senegambia.

Antilocapridæ.

Antilocapra americana. A second pair of horns shed by the specimen in the Zoological Society's Gardens; W. A. Forbes, P. Z. S. 1882, p. 1 [*cf.* Zool. Rec. xvii. *Mamm.* p. 27].

Camelopardalidæ.

The *Sivatheriidæ* should be amalgamated with this family; R. Lydekker, Rec. Geol. Surv. Ind. xv. p. 30.

Cervidæ.

Heude, —. Note sur quelques Cerfs de Chine. Bull. Soc. Philom. (7) vi. p. 183.

The author makes remarks on the known Chinese Deer, and then indicates no less than 9 so-called new species (see *infrà*).

Krause, E. Die Entwickelung des Hirschgeweihs in der Vorzeit. Kosmos, xi. p. 23, 1882.

NITSCHE, H. Beiträge zur Naturgeschichte des Reh-, Roth- und Damwildes. JB. Tharand. forstl. Ges. xxxiii.

[Not seen by Recorder; *cf.* Zool. Anz. vi. p. 264.]

A long review of H. A. PAGENSTECHER's paper "Die Entwickelung des Hirschgeschlechts," is given in Kosmos, xi. p. 52.

RÜTIMEYER, L. Studien zu der Geschichte der Hirschfamilie. Verh. Ges. Basel, vii. p. 3.

Contains remarks upon the cranial characters of the genera of this family. A continuation of the paper noticed last year [*cf.* Zool. Rec. xviii. *Mamm.* p. 24].

Rangifer tarandus. On remains found near Paris; A. Gaudry, La Nature, x. (1) p. 91.

Cervus frinianus, gracilis, lacrymosus, ignotus (perhaps = *C. kopschi*), *andreanus, joretianus, decilleanus, cyclorhinus,* and *hyemalis,* spp. nn., Heude, *l. c.*

Cervus (*Axis*) *matheronis.* On remains from Pikermi allied to this fossil species; Dames, SB. nat. Fr. 1882, p. 71.

Hyelaphus porcinus. On an abnormality in the horn of a specimen of this species; J. Cockburn, J. A. S. B. li. pt. ii. p. 44. The horn is described, and the author forms a theory of the evolution of cervine antlers to account for it.

Capreolus caprea. On its existence in England; J. E. Harting, Pop. Sci. Rev. xx. p. 136.

Hydropotes inermis. Supplementary notes on its anatomy; W. A. Forbes, P. Z. S. 1882, p. 636. The brain, which is figured, and the generative organs agree very closely with those of *Capreolus.*

Dicroceros fallax, sp. n. (foss.), R. Hoernes, JB. geol. Reichsanst. xxxii. p. 157, Turnau, Steiermark.

Cariacus columbianus does not extend eastward of the Cascade Mountains; C. Bendire, P. U. S. Nat. Mus. 1882, p. 348.

SIRENIA.

ALLEN, J. A. Bibliography of the *Sirenia.* [See *Cetacea.*]

ROGER, O. List of the known fossil species [see *supra*, p. 13.]

HALITHERIIDÆ.

Halitherium veronense. On some lower incisors of this species found at Venice; A. de Zigno, Mem. Ist. Venet. xxi. p. 775.

CETACEA.

ALLEN, J. A. Preliminary List of Works and Papers relating to the Mammalian Orders *Cete* and *Sirenia.* Bull. U. S. Geol. Surv. vi. p. 399.

This valuable list contains more than a thousand references to various

papers and books on the subjects mentioned. It forms a complete bibliography of these two Orders from the time of Albertus Magnus down to 1845.

Flower, W. H. Lectures on the Anatomy, Physiology, and Zoology of the *Cetacea*. Abstract in Brit. Med. Journ. 1881 (1), pp. 553, 632, 717, 760, 794, 840, 876, 962, and (2) p. 38.

[Omitted from Zool. Rec. xviii.]

Jouan, H. Note sur les restes de Cétacés du Musée de Cherbourg. Mem. Soc. Cherb. iii. p. 359.

A mere list of specimens.

Van Beneden, P. J. Sur l'articulation temporo-maxillaire chez les Cétacés. Arch. Biol. iii. p. 669.

Remarks on the total absence of the synovial membrane.

——. Description des Ossements Fossiles des environs d'Anvers. Part III. Cétacés. Genres *Megaptera*, *Balænoptera*, *Burtinopsis* (g. n., see *Balænidæ*), and *Erpetocetus*. Ann. Mus. Belg. (Serie Paléontol.) vii.

The present part of this splendid work gives a full account of the fossil *Balænidæ* found near Antwerp, and is illustrated by a large folio volume containing more than 100 beautifully executed plates.

Balænidæ.

Beauregard, H. Étude de l'articulation temporo-maxillaire chez les Balænoptères. J. de l'Anat. Phys. xviii. p. 16.

Examined in a full grown *Balænoptera musculus* and a young *B. sibbaldi*.

—— & Boulart, R. Recherches sur le larynx et la trachée des Balænides. *Tom. cit.* p. 611.

—— ——. Recherches sur les appareils genito-urinaires des Balænides. *Tom. cit.* p. 158.

Founded on several adult and young specimens of both sexes, referable mostly to *Balænoptera sibbaldi*.

Pouchet, G., & Chabry, —. Sur l'évolution des dents des Balænides. C. R. xciv. p. 540.

Observed on fœtuses of *Balænoptera sibbaldi* and *musculus*.

Balæna biscayensis. Notes on the remains of this rare species in the Museum of Rochelle; P. J. Van Beneden, Bull. Ac. Belg. (3) iv. p. 407. On its occurrence in the Mediterranean; H. H. Giglioli, Nature, xxv. p. 505.

Balænoptera borealis. On a specimen captured in the Firth of Forth; W. Turner, J. Anat. Phys. xvi. p. 471. This is the first properly authenticated specimen of Rudolphi's Whale caught on the British coast.

Burtinopsis, g. n. (foss.), P. J. Van Beneden, *ibid.* Intermediate between *Megaptera* and *Balænoptera*. *B. similis* and *minutus*, spp. nn., *id. ibid.*, Angers.

Mesocetus agrami, sp. n. (foss.), P. J. Van Beneden, Mem. Ac. Belg., Croatia. [Not seen by Recorder; *cf.* Am. Nat. xvi. p. 1027.]

Physeteridæ.

Physeter macrocephalus. A full account of the anatomy and external characters, with numerous figures, of a specimen of this species stranded at Porto S. Giorgio, Italy; L. De Sanctis, Atti Acc. Rom. ix. p. 160, 1881.

Hyperoodon. On the species of this genus; W. H. Flower, P. Z. S. 1882, p. 722. The author, relying on the evidence given in the paper next quoted, considers the specific identity of *H. latifrons*, Gray, with the common *H. rostratus* as finally established, the former merely representing the adult male of the species.

Hyperoodon rostratus. On its characters and habits; D. Gray, P. Z. S. 1882, p. 726. Valuable notes are made on the distribution, habits, and commercial value of this species, accompanied by figures showing the manner in which the shape of the head of the male changes during growth.

Hyperoodon planifrons, sp. n., W. H. Flower, P. Z. S. 1882, p. 392, Dampier Archipelago, N. W. Australia.

Mesoplodon bidens. On a specimen of this rare whale captured in Shetland; W. Turner, J. Anat. Phys. xvi. p. 458.

Delphinidæ.

Capellini, G. Del *Tursiops courtesii* e del delfino fossile di Mombercelli nell' Astigiano. Rend. Acc. Bologn. 1881–2, p. 88.

[Not seen by Recorder; *cf.* Zool. Anz. vi. p. 265.]

Van Beneden, P. J. Mémoire sur les Orques observés dans les mers d'Europe. Mém. Ac. Belg. xliii. Art. 5.

The author believes that there is but a single species of *Orca*, namely, *O. gladiator*.

Globiocephalus melas. A full and interesting account of the fishery for the so-called "Grind-Whale" in the Færöe Islands is given by H. C. Müller in Fish and Fisheries, Art. i. 1882 [published 1883].

Pseudorca? mediterranea, sp. n., H. H. Giglioli, Zool. Anz. 1882, p. 288, Mediterranean. This is the species to which the anterior part of a mandible, figured in the Osteographie des Cétacés, pl. lxiv. fig. 3, should be referred.

EDENTATA.

Flower, W. H. On the Mutual Affinities of the Animals composing the Order *Edentata*. P. Z. S. 1882, p. 358.

The author entirely abolishes the old division of this Order into the *Phytophaga* and the *Entomophaga*, and shows that all the New World forms are more closely related to each other than any of them are to the

Old World genera. Five families are recognized—the *Bradypodidæ*, *Myrmecophagidæ*, and *Dasypodidæ* of the New World, and the *Manidæ* and *Orycteropodidæ* of the Old. A table is appended, showing their affinities with each other and with the fossil forms.

[Flower, W. H.] Lectures on the Anatomy, Physiology, and Zoology of the *Edentata*. Abstract in Brit. Med. Journ. 1882 (1) pp. 649, 694, 737, 768, 901, 937, and (2) pp. 13, 88, & 130.

Rosenberg, C. Beobachtungen an der Wirbelsäule eines Edentaten. SB. Ges. Dorp. vi. p. 255.

Bradypodidæ.

Nothropus, g. n. (foss.), H. Burmeister, SB. Ak. Berl. 1882, p. 613. Allied to *Choloepus*, but the teeth of somewhat different shape. *N. priscus*, sp. n., *id. l. c.*, Quaternary Beds on the River Carcarañal, Argentine Republic.

Myrmecophagidæ.

Myrmecophaga jubata. On its anatomy; W. A. Forbes, P. Z. S. 1883, p 287, pl. xv. There is a rudimentary clavicle present in this animal, a fact hitherto denied.

Manidæ.

F. A. Jentink monographs the species of this family; Notes Leyd. Mus. iv. p. 193. 7 species are allowed, of which 4 are African and 3 are Asiatic. The characters and synonymy of the species are given in full, and lists of the specimens in the Leyden Museum are appended.

MARSUPIALIA.

Katz, O. Zur Kenntniss der Bauchdecke und der mit ihr verknupften Organe bei den Beutelthieren. Z. wiss. Zool. xxxvi. p. 611.

Dasyuridæ.

On the anatomy of *Thylacinus* and *Phascologale*. [See Cunningham, D. J., *suprà*, p. 5.]

Phalangistidæ.

On the anatomy of *Cuscus*. [See Cunningham, *l. c.*]

Phascolarctos cinereus. On its muscular and general anatomy; A. H. Young, J. Anat. Phys. xvi. p. 217. [*Cf.* also Zool. Rec. xviii. *Mamm.* p. 30.]

Nototherium mitchelli. Description of part of its femur; R. Owen, J. G. Soc. xxxviii. p. 394.

MACROPODIDÆ.

W. H. FLOWER, Encycl. Brit. (9) xiii. [1881], pp. 838–841, figs. 1–4, Article "Kangaroo," has given a full account of this family. The following is his arrangement:—

Sect. I. *Macropodinæ.*
Genera, *Macropus, Dendrolagus, Dorcopsis.*
Sect. II. *Hypsiprymninæ.*
Genera, *Hypsiprymnus, Bettongia. Æpyprymnus, Hypsiprymnodon.*

The characters of the genera and many of the species are given in detail, and there is a short account of the fossil forms.

GREENE, W. T. The Kangaroo. Sci. Goss. xviii. pp. 3 & 27.

A popular account of the family.

Halmaturus bennetti. On its female reproductive organs; G. Cattaneo, Atti Soc. Ital. xxiv. [See Zool. Anz. v. p. 511.]

PLAGIAULACIDÆ.

Thylacoleo. On its ancestry and habits; E. D. Cope, Am. Nat. xvi. p. 520. This animal should be placed in the present family, and is nearly allied to the American *Catopsalis* and *Ptilodus*, the latter of which has a somewhat similar dentition. These animals are related to the *Macropodidæ*, through a supposititious ancestor here named *Tritomodon.* A synopsis of the genera is given.

Neoplagiaulax eocænus and *marshi*, g. &. spp. nn. (foss.), Lemoine, C. R. xcv. p. 1009, Reims. Allied to *Plagiaulax* and *Ctenacodon.*

Ptilodus trovessartianus, sp. n. (foss.), E. D. Cope, Am. Nat. xvi. p. 686, New Mexico.

Polymastodon taoensis, g. & sp. n. (foss.), *id. l. c.* p. 684, Eocene of New Mexico. Allied to *Ptilodus* and *Catopsalis.*

Catopsalis foliatus, g. & sp. nn. (foss.), *id. l. c.* p. 416, Puerco Beds of N. W. New Mexico. *C. pollux*, sp. n. (foss.), *id. tom. cit.* p. 685, New Mexico.

Meniscoessus conquistus, g. & sp. nn. (foss.), *id. l. c.* p. 830, "Laramie Beds."

MONOTREMATA.

ORNITHORHYNCHIDÆ.

Ornithorhynchus paradoxus. On its heart; E. Ray Lankester, P. Z. S. 1882, p. 549, pls. xxxviii.–xli. The septal flap of the right auriculo-ventricular valve is nearly or quite absent, and there is no fossa ovalis, although it is usually described as present.

Tachyglossidæ.

Acanthoglossus bruijni. The external characters and the skull and limb-bones of this rare animal are figured and shortly described by A. Dubois, Bull. Soc. Zool. vi. p. 266. It is renamed *Bruijnia tridactyla*, the name *Acanthoglossus* being pre-occupied. The use of the generic term *Bruijnia* does not invalidate *bruijnii* as a specific name, so that this animal must unfortunately bear the barbarous combination of *Bruijnia bruijni* as its scientific name.

AVES.*

BY

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The principal ornithological publications of the year 1882 were the completion of Elliot's "Monograph of the Hornbills," Sclater's "Jacamars and Puff-birds," Salvadori's "Uccelli di Papuasia," and the Atlas to the Part "Aves" of the great work on the Natural History of Madagascar by Mm. Milne-Edwards and Grandidier. Some important essays have been contributed by Dr. Gadow and Dr. Krukenberg on the colouring of feathers.

The General Subject, with Titles of Separate Works and of the more Important Papers Published in Proceedings of Societies, &c.

Report of the British Association Committee on the Migration of Birds. Rep. Brit. Ass. 1882, pp. 283–288.

Jahresbericht (1880) des Ausschusses für Beobachtungs-stationen der Vögel Deutschlands. J. f. O. 1882, pp. 18–110.

Gives detailed observations on the migration and habits of the Birds of Germany from records kept by observers in various parts of the Empire.

Audebert, J. Beiträge zur Kenntniss der Vögel Madagascar's. Gef. Welt, 1882, pp. 383–385, 437 & 438, 459 & 460.

Bartlett, E. On some Mammals and Birds collected by Mr. J. Hauxwell in Eastern Peru. P. Z. S. 1882, pp. 373–375. [*Formicariidæ*, *Tinamidæ*.]

* The arrangement here adopted is based upon the British Museum "Catalogue of Birds." Although the system of classification in that work does not commend itself to all ornithologists, there is an obvious advantage in following the order there introduced, as it allows of a complete record of the additions to the species and genera there enumerated, and obviates the danger of new species being overlooked, concerning the allocation of which opinions have varied with the views of each previous Recorder.—R. B. S.

Batchelder, C. F. Notes on the Summer Birds of the Upper St. John. Bull. Nutt. Orn. Club, vii. pp. 106–111 & 147–162.

Bean, T. H. Notes on Birds collected during the Summer of 1880 in Alaska and Siberia. P. U. S. Nat. Mus. v. pp. 144–173.

77 species recorded, the most important being *Eurrhinorrhynchus pygmæus* [*Scolopacidæ*]. A table of distribution of the species noticed will be found useful.

Beckham, C. W. Short Notes on the Birds of Bayou Sara, Louisiana. *Tom. cit.* pp. 159–165.

86 species noticed.

Bennett, K. H. On the Breeding-place of *Platalea flavipes* and *Ardea pacifica*. P. Linn. Soc. N. S. W. vii. pp. 324–328. [*Plataleidæ*, *Ardeidæ*.]

Bicknell, E. P. A Review of the Summer Birds of a part of the Catskill Mountains, with Prefatory Remarks on the Faunal and Floral Features of the region. Tr. Linn. Soc. N. Y. i. pp. 115–168. [See also *Turdidæ*.]

Biddulph, J. On the Birds of Gilgit. Ibis, 1882, pp. 266–290, pls. viii. & ix.

Additional notes to the author's former paper (Zool. Rec. xviii. *Aves*, p. 3). Reprinted Str. Feath. x. 1882, pp. 257–278. [See *Accentoridæ*, *Fringillidæ*.]

Blakiston, T. W., & Pryer, H. Birds of Japan. Tr. As. Soc. Japan, x. pt. 1, pp. 88–186.

326 species recognized. This is by far the most complete list of Japanese birds yet published.

Blasius, W. Neuer Beitrag zur Kenntniss der Vogelfauna von Borneo (nach dem Sammlungen des Herrn Dr. Platen). J. f. O. 1882, pp. 241–255.

The species noticed are all well known, but some good critical notes will be found.

——. On a Collection of Birds from the Isle of Ceram made by Dr. Platen in November and December, 1881. P. Z. S. 1882, pp. 697–711.

21 species recorded, with valuable critical notes.

——. [See also *Muscicapidæ*.]

Bocage, Barboza du. Aves das possessões portuguezas d'Africa occidental. Vicesima secunda Lista. J. Sc. Lisb. No. xxxii. 1882.

36 species enumerated.

——. Vigesima terceira Lista. *Tom. cit.* No. xxxiii. 1882.

35 species enumerated.

Böhm, R. Ornithologische Notizen aus Central Afrika. J. f. O. 1882, pp. 178–209.

Contains a series of interesting observations on the birds of Kakoma

and other little-known parts of Eastern and Central Africa. [See also Reichenow, A.]

Bolau, H. Beitrag zur Kenntniss der ostsibirischen Vogelwelt. *Op. cit.* 1882, pp. 329–344.

Describes a collection made by the brothers Dörries in the Ussuri district.

Booth, E. Rough Notes on the Birds observed during twenty years' shooting and collecting in the British Islands. Part ii. London: 1882, fol.

The field notes are of the first quality, and the plates represent many interesting stages of plumage, to which little attention has been given in other works. [See *Accipitres.*]

Brewster, W. Notes on the habits and changes of plumage of the Acadian Owl (*Nyctale acadica*), with some additional records of its breeding in Massachusetts. Bull. Nutt. Orn. Club, vii. pp. 23–25. [*Striges.*]

——. On Kennicott's Owl and some of its allies, with a description of a proposed new race. *Tom. cit.* pp. 27–33. [*Striges.*]

——. Impressions of some Southern Birds. *Tom. cit.* pp. 94–104.

Field notes on Birds observed in Southern Georgia.

——. On a Collection of Birds lately made by Mr. F. Stephens in Arizona. *Tom. cit.* pp. 65–86, 135–147, 193–312.

A most interesting and important paper, giving field notes on some of the rarest American Birds by the collector. The author's critical notes are also most valuable. [*Vireonidæ, Tyrannidæ.*]

——. Notes on some Birds collected by Captain Charles Bendire at Fort Walla Walla, Washington Territory. *Tom. cit.* pp. 225–233.

——. Notes on some Birds and Eggs from the Magdalen Islands, Gulf of St. Lawrence. *Tom. cit.* pp. 253–256.

Brown, N. C. Description of a new Race of *Peucæa ruficeps* from Texas. Bull. Nutt. Orn. Club, vii. p. 26. [*Emberizidæ.*]

——. A Reconnaisance in South-western Texas. *Tom. cit.* pp. 33–42.

104 species observed, with field notes.

Buckley, T. E. On the Variability of Plumage exhibited by the Red Grouse (*Lagopus scoticus*). P. Z. S. 1882, pp. 112–116.

The variations in colour in the Red Grouse are not, as generally supposed, caused by a different habitat, but are to be found in the same locality. [*Phasianidæ.*]

Buller, W. Manual of the Birds of New Zealand. Wellington, N. Z., 1882, 8vo, pp. i.–xii. 1–107, with plates.

A very useful handbook, illustrating in a concise manner the leading characters of every species found in New Zealand, with short notes on their habits, principally taken from the author's larger work on the

subject. From the latter are mainly derived the plates, which are well rendered by photo-lithography.

[Buller, W.] On the *Notornis*; Tr. N. Z. Inst. xiv. p. 238 [*Rallidæ*].

Butler, E. A., Feilden, H. W., & Reid, S. G. Ornithological Notes from Natal. Zool. 1882, pp. 165–171, 204–212, 243–258, 297–303, 335–345, 423–429, & 460.

One of the best papers of the year, each of the three authors being well known as a careful observer in the field.

Cabanis, J. Ueber die im Berliner Museum befindlichen Arten der Afrikanisches Drossel-Gruppe Peliocichla. J. f. O. 1882, pp. 317–321. [*Turdidæ*.]

Chamberlain, M. Notes on some of the rarer Birds of Southern New Brunswick. Bull. Nutt. Orn. Club, vii. pp. 104–106.

——. A Catalogue of the Birds of New Brunswick, with brief notes relating to their migrations, breeding, relative abundance, &c. Bull. Nat. Hist. Soc. N. Brunsw. No. 1, pp. 23–68. St. John, N.B: 1882.

Cheeseman, T. F. [See *Charadriidæ*, *Coraciidæ*.]

Clarke, E. A. Ornithological Notes from Yorkshire. Zool. 1882, pp. 171–178.

Chiefly on migration and breeding habits.

Cocks, A. H. Notes of a Naturalist on the West Coast of Spitzbergen. Zool. 1882, pp. 321–332, 378–386, & 404–418.

A very well-written paper, containing a diary of natural history observations, concluding with a list of the birds noticed.

Cordeaux, J. Ornithological Notes from North Lincolnshire during the autumn of 1881. *Tom. cit.* 1882, pp. 84–90.

A careful record of migrating species.

Coues, E. The Coues Check List of North American Birds. Second Edition, revised to date, and entirely re-written, under direction of the author, with a dictionary of the etymology, orthography, and orthoepy of the scientific names, the concordance of previous lists, and a catalogue of his ornithological publications. Boston: 1882, 8vo, pp. 1–165.

The scope of this useful and laborious work is fully explained by the title. [*Cf.* Zool. 1882, pp. 395–400; Bull. Nutt. Orn. Club, vii. pp. 242–246; Ibis, 1882, pp. 99–102.]

Davidson, J. Rough List of the Birds of Western Khandesh. Str. Feath. x. 1882, pp. 279–327.

Dixon, C. Notes on the Birds of the Province of Constantine, Algeria. Ibis, 1882, pp. 550–579, pl. xiv.

Describes a most interesting trip made by the author in company with Mr. H. J. Elwes. Although only absent from England for a month, 94 species were noticed, 1 being new [*Turdidæ*].

A. De la variabilité des Oiseaux du genre *Loxia*. Bull. Mus. Belg. i. pp. 81-87. [*Fringillidæ*.]

Dutcher, W. See *Corvidæ*.

Dybowski, B. Observations sur les Oiseaux de la famille des Mormonidés. Bull. Soc. Zool. Fr. vii. pp 290–300. [*Alcidæ*.]

Elliot, D. G. A Monograph of the *Bucerotidæ*, or Family of the Hornbills. Part ix. (1881), and Part x. (extra number).

Concludes the work. [See *Bucerotidæ*.]

Elliott, H. W. A Monograph of the Seal-Islands of Alaska. Reprinted with additions from the report on the Fisheries Industries of the Tenth Census. Washington : 1882, 4to, pp. 175.

Contains a reprint of Dr. Coues' list of Birds of the Pribylow Islands, with further notes by Mr. Elliott.

Feilden, H. W. See Butler, E. A.

Filhol, H. [See *Spheniscidæ*.]

Finsch, O. Ornithological Letters from the Pacific. ix. New Zealand. Ibis, 1882, pp. 391–402.

Forbes, W. A. Zoology of the Voyage of H.M.S. 'Challenger.' Part xi. Report on the Anatomy of the *Tubinares*. London : 1882, 4to.

——. Note on the Gall-Bladder, and some other points in the anatomy of the Toucans and Barbets (*Capitonidæ*). P. Z. S. 1882, pp. 94–96.

In connection with the peculiar shape of the gall-bladder in Toucans and Woodpeckers, other anatomical points are mentioned, in which the *Rhamphastidæ* and *Capitonidæ* prove to be closely allied to the *Picidæ*.

——. On some points in the Anatomy of the Indian Darter (*Plotus melanogaster*), and on the mechanism of the neck in the Darters (*Plotus*), in connection with their habits. *Tom. cit.* pp. 208–212.

Certain differences between the peculiar stomachs of the Indian, West African, and South American species of Darters are pointed out. The mode of the bird's catching and piercing its prey by means of the arrangement of the structure of the neck is practically explained, with the help of a diagrammatic model.

——. Description of the pterylosis of *Mesites*, with remarks on the position of that genus. *Tom. cit* pp. 267–270.

Mesites, *Eurypyga*, and *Rhinochetus* are probably the only living descendants of a certain more generalized Pluvialine form, *Mesites* being, however, more nearly related to *Rhinochetus* than to *Eurypyga*.

——. Note on a peculiarity of the trachea of the Twelve-wired Bird of Paradise (*Seleucides nigra*). *Tom. cit.* pp. 333–335. [*Paradisiidæ*].

——. On some points in the Anatomy of the Todies (*Todidæ*), and on the affinities of that group. *Tom. cit.* pp. 442–450. [*Todidæ*.]

——. On the variations from the normal structure of the foot in Birds. Ibis, 1882, pp. 386–390.

Gives illustrations of the way in which the number of digits varies in different genera and families of Birds.

[Forbes, W. A.] Note on some points in the Anatomy of an A[illegible] Duck (*Biziura lobata*). Tom. cit. pp. 455–458.

Describes particularly the trachea, and a peculiar gular pouch in the male. [*Anatidæ*.]

——. Contributions to the Anatomy of Passerine Birds. Part v. On the structure of the genus *Orthonyx*. Tom. cit. pp. 544–546. [*Timeliidæ*.]

——. On the rudimentary hallux in Birds. *Tom. cit.* pp. 548 & 549.

Shows that many species of Birds hitherto supposed to be "three-toed," really have a hallux, though it is generally concealed underneath the skin.

——. Contributions to the Anatomy of Passerine Birds. Part vi. On *Xenicus* and *Acanthisitta* as types of a new Family (*Xenicidæ*) of Mesomyodian Passeres from New Zealand. *Tom. cit.* pp. 569–571. [See *Xenicidæ*.]

——. On a new species of Hemipode from New Britain. Ibis, 1882, pp. 428–431, pl. xii. [*Turnicidæ*.]

——. The claw on the "Index" finger of the *Cathartidæ*. Am. Nat. xvi. pp. 141 & 142.

Notes on the presence of this claw in the American Vultures and other groups of Birds.

Forster, J. R. Animals of Hudson's Bay. [Edited by P. L. Sclater.] 8vo, pp. [Willughby Society (reprint) 1882.]

——. Catalogue of the Animals of North America, or Faunula Americana, 1771. [Edited by P. L. Sclater.] 8vo, pp. 43. [Willughby Society (reprint) 1882.]

Gadow, Hans. On some points in the Anatomy of *Pterocles*, with remarks on its Systematic Position. P. Z. S. 1882, pp. 312–332. [*Pteroclidæ*.]

——. On the colour of feathers as affected by their structure. *Tom. cit.* pp. 409–421, pls. xxvii. & xxviii.

Certain colours, *e.g.*, blue, violet, and green, are due to a particular structure of the feathers, and not produced by colour pigment. The metallic colours are likewise structural. Birds showing such metallic varying colours should be described and examined under the following three standard positions:—Position A. The eye being between the light and the object, the latter being kept parallel to the line of vision or to the light. Position B. Eye between light and object, the latter being kept vertically to the light. Position C. Object between eye and light the object being kept again parallel to the light.

——. See also Haswell, W. A.

Gentry, T. C. Illustrations of Nests and Eggs of Birds of the United States. Philadelphia : 1880–82, 4to, pts. 1–25, pp. 1–300, pls. i.–liv.

[Not seen by the Recorder.] [*Cf.* Bull. Nutt. Orn. Club, vii. pp. 246–249.]

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

[redacted]DWIN-AUSTEN, H. H. On Specimens of the Males and Females of *Phasianus humiæ* from Munipur. P. Z. S. 1882, pp. 715–718, pl. li. [*Phasianidæ*.]

GOULD, JOHN (The late). The Birds of Asia. Part xxxiii. London: 1882.

Since the death of the author, this work has been continued by the present Recorder, whose initials are appended to each article. [*Timeliidæ*, *Laniidæ*, *Picidæ*.]

——. The Birds of New Guinea and the adjacent Papuan Islands, including any new species that may be discovered in Australia. Part xiii. London: 1882.

The letter-press in this work has also been supplied by the Recorder. [*Campophagidæ*, *Muscicapidæ*, *Laniidæ*, *Sturnidæ*, *Alcedinidæ*, *Columbidæ*].

GREENE, W. T. Notes on Cage Birds; or practical hints on the management of British and Foreign Cage Birds, hybrids, and canaries. London: 1882, 8vo, pp. 1–240.

Contains the experience of various persons in bringing up all kinds of cage-birds.

GRIEVE, S. Notice of the discovery of the remains of the Great Auk or Gare-fowl (*Alca impennis*, L.) on the Island of Oronsay, Argyllshire. J. L. S. xvi. pp. 479–487, pl. ix. [*Alcidæ*.]

GRISDALE, T. On the Birds of Montserrat. Ibis, 1882, pp. 485–493, pl. xiii.

14 species noticed. [*Icteridæ*.]

GURNEY, J. H. A Second List of Birds from Mombasa, East Africa. Ibis, 1882, pp. 71–75.

16 species added to the author's former list (Zool. Rec. xvii. *Aves*, p. 12).

——. Notes on the Raptorial Birds collected in New Britain by Lieut. G. E. Richards, R.N. *Tom. cit.* pp. 126–132.

——. Notes on a Catalogue of the Accipitres in the British Museum. By R. Bowdler Sharpe (1874). *Tom. cit.* pp. 146–162 & 579–598.

In continuation of former articles (Zool. Rec. xvii. *Aves*, p. 11).

——. List of a Collection of Raptorial Birds from the neighbourhood of Saigon in Cochin China. *Tom. cit.* pp. 235 & 236. [*Accipitres*.]

——. On some Raptorial Birds recently acquired by the Norwich Museum. *Tom. cit.* pp. 452–457. [*Accipitres*.]

——, JUN. Ornithological Notes from East Norfolk. Zool. 1882, pp. 294–296.

HARGITT, E. Notes on Woodpeckers. No. ii. The Genus *Iyngipicus*. Ibis, 1882, pp. 19–51. [*Picidæ*.]

HARTING, J. E. On the Eggs of some rare Wading Birds from Madagascar. P. Z. S. 1882, pp. 353–357. [*Charadriidæ*, *Scolopacidæ*.]

HARTLAUB, G. Beitrag zur Ornithologie des Östlich-Äquatorial-biete Africas. Nach Sendungen und Noten von D. Emin Bey Ladò. Abhandl. Nat. Ver. Bremen, vii. pp. 83–128, taf. v.

154 species noticed, and a complete list of Emin Bey's collections given, with a map of the district where they were obtained. 11 are new [*Muscicapidæ, Laniidæ, Timeliidæ, Nectariniidæ, Ploceidæ.*]

——. Ueber einige neue Vögel aus dem oberen Nilgebiete. J. f. O. 1882, pp. 321–329, taf. i. [See *Laniidæ, Paridæ, Timeliidæ, Ploceidæ, Fringillidæ, Capitonidæ, Perdicidæ.*]

HARVIE-BROWN, J. A. Remarks on the Grouse Disease. Zool. 1882, pp. 401–404.

The author traces the cause of the disease to "over-stocking, over-preservation, and the complete and indiscriminate slaughter of certain species of vermin (or so-called vermin)."

——. [See also *Turdidæ.*]

HASWELL, W. A. Note on the Anatomy of two rare Genera of Pigeons. P. Linn. Soc. N. S. W. vii. pp. 115 & 116. [*Columbæ.*]

——. Note on some points in the Anatomy of the Pigeons referred to by Dr. Hans Gadow in a recent Paper on the Anatomy of *Pteroclides*. *Tom. cit.* pp. 397–402.

A reply to some of Dr. Gadow's criticisms.

HAY, W. O. D. A List of Birds from the Lower Mississippi Valley, observed during the summer of 1881, with brief notes. Bull. Nutt. Orn. Club, vii. pp. 89–94.

HODEK, E. Nützliche und schädliche Vögel. MT. orn. Ver. Wien, 1882, pp. 80–85.

HOFFMAN, W. J. List of Birds observed at Ft. Berthold, D. T., during the month of September, 1881. P. Bost. Soc. xxi. pp. 397–404.

HOLUB, E. Vortrag über die Vogelwelt Sudafrika's. MT. orn. Ver. Wien, 1882, pp. 1–7.

——. Ueber die Vogelwelt Südafrikas. Vortrag gehalten im grünen Saale der K. K. Akad. d. Wissensch. im Ornith. Vereine am 11 Nov. 1881. *Op. cit.* No. 1.

A treatise on the principal features of South African Ornithology.

——, & PELZELN, A. VON. Beiträge zur Ornithologie Südafrikas. Mit besonderer Berücksichtigung der von Dr. Holub auf seinen südafrikanischen Reisen gesammelten und im Pavillon des Amateurs zu Wien ausgestellten Arten. Wien: 1882, 8vo, pp. 385, pls.

Field-notes, with good illustrations of nests, and osteological specimens. 3 species are figured, 2 being new to science (*Timeliidæ, Laniidæ,* and *Sturnidæ*).

HUET, M. Note sur les naissances d'Oiseaux obtenus en 1881 à la Ménagerie du Muséum d'Histoire Naturelle. Bull. Soc. Acclim. 1882, p. 352.

HUME, A. O. On the flight of Birds. Str. Feath. x. pp. 248–254.

——. The British Museum Catalogue of Birds. Vol. vi. Str. Feath. x. 1882, pp. 256 & 257.

A review of the volume. [*Cf.* Zool. Rec. xvii. *Aves*, p. 27.]

HUXLEY, T. H. On the respiratory organs of *Apteryx*. P. Z. S. 1882, pp. 560–569. [*Ratitæ*.]

INGERSOLL, E. Birds'-nesting: a Handbook of Instruction in Gathering and Preserving the Nests and Eggs of Birds for the purpose of Study. Salem, Mass.: 1882.

JEFFRIES, J. A. On the claws and spurs on birds' wings. P. Bost. Soc. xxi. pp. 301–306.

Gives a very useful list of the Birds in which wing-claws and spurs occur, with the number of phalanges in the hand.

——. The Colors of Feathers. Bull. Nutt. Orn. Club, vii. pp. 129–135, pl. vii.

——. On the Sesamoid at the front of the Carpus in Birds. *Tom. cit.* pp. 13–15.

JOHNSTON, H. H. Report on the Natural History of Mossâmedes and district, and of South-western Africa generally; with reference to the proposed expedition of the Earl of Mayo. 1882, 8vo.

This privately printed Report contains amongst other things a list (pp. 26–28) of the more remarkable birds to be met with in South-western Africa.

KELHAM, H. R. Ornithological Notes made in the Straits Settlements and in the Western States of the Malay Peninsula. Ibis, 1882, pp. 1–18 & 185–204.

Contains excellent field-notes on Malayan birds. [Zool. Rec. xvii. *Aves*, p. 14.]

KNOWLTON, F. H. Remarks on some Western Vermont Birds. Bull. Nutt. Orn. Club, vii. pp. 63 & 64.

Interesting remarks on Woodpeckers.

KRUKENBERG, C. F. W. Die Farbstoffe der Federn. Vergl. Phys. Stud. Heidelberg, ii. Abth. 2. [See J. f. O. p. 464; Ibis, 1882, p. 104.]

——. See also MEYER, A. B.

LAWRENCE, G. N. Description of a new sub-species of *Loxigilla* from the Island of St. Christopher, West Indies. P. U. S. Nat. Mus. iv. pp. 204 & 205 (*Fringillidæ*).

——. Descriptions of two new Species of Birds from Yucatan, of the families *Columbidæ* and *Formicaridæ* [q. v.]. Ann. N. York Ac. ii. pp. 287 & 288.

[See also *Cypselidæ*, *Picidæ*, *Fringillidæ*.]

LAYARD, E. L. The Birds of South Africa. New Edition, thoroughly revised and augmented by R. Bowdler Sharpe. Part v. pp. 337–528, pls. iii. & viii.

Continues the work as far as the *Alaudidæ*. [*Strigidæ*, *Timeliidæ*, *Laniidæ*.]

——. [See also *Psittaci*.]

——, & LAYARD, L. C. Notes on the Avifauna of New Caledonia. A Catalogue of the Birds of the Island known to the authors. With remarks by the Rev. Canon Tristram. Ibis, 1882, pp. 493–546.

97 species are recorded from New Caledonia, full notes on habits and distribution being given.

LEACH, W. E. Systematic Catalogue of the specimens of the indigenous Mammalia and Birds in the British Museum, 1816. (Edited by Osbert Salvin.) 8vo, pp. 44. [Willughby Society (reprint) 1882.]

LEIDY, J. On some Entozoa of Birds. P. Ac. Philad. 1882, p. 109.

Filaria nequani, sp. n. in *Plotus anhinga*, and *Ascaris spiculigera* in *Graculus dilophus*, *Pelecanus trachyrrhynchus* and *P. fuscus*.

LICHTENSTEIN, H. Catalogus rerum naturalium rarissimarum. Hamburgi d. xxi. Octobr., 1793, auctionis lege distrahendarum. (Edited F. D. Godman.) 8vo, pp. 1–60. [Willughby Society (reprint) 1882.]

LLOYD, J. HAYES. Letter from. Ibis, 1882, pp. 469–471.

Corrections respecting birds from Konkan, mentioned in Major Butler's paper on the birds of the Deccan and South Mahratta Country. [Zool. Rec. xvii. *Aves*, p. 5.]

LUCAS, F. A. Notes on the Os prominens. Bull. Nutt. Orn. Club, vii. pp. 86–89.

Gives a list of genera in which the author has noticed this sesamoid bone on the wing of birds.

MACPHERSON, H. Rough Notes in Skye and Eigg. Zool. 1882, pp. 418–423.

MAINDRON, M. Coup-d'œil sur la faune de la Nouvelle Guinée. Bull. Soc. Z. Fr. vii. pp. 354–373.

The author is evidently not much acquainted with the ornithology of New Guinea.

MARSCHALL, A. F., & PELZELN, A. VON. Ornis Vindobonensis. Die Vogelwelt Wien's und seiner Umgebungen, mit einem Anhang: die Vögel des neusiedler See's. Wien: 1882.

[Not seen by the Recorder; *cf.* MT. orn. Ver. Wien, 1882, p. 125.]

MELA, A. J. Vertebrata Fennica, sive Fauna Animalium Vertebratorum regionis Fennicæ Naturalis. Helsingfors: 1882, 8vo, pp. i.–xi. & 1–426.

A popular work on the Vertebrates of Finland. The Birds occupy pp. 48–250, and have small woodcut illustrations.

MENZBIER, M. Ornitologicheskaya Geographiaya Evropeiskoye Rossiye. Moskoa: 1882, pt. i. 8vo, pp. 1–524, pls. i.–viii. (Ibis, 1883, p. 104.)

An elaborate essay (in Russian) on geographical distribution of Russian Birds throughout the world. [See *Accipitres*, *Paridæ*.]

MERRIAM, C. HART. List of Birds ascertained to occur within ten miles from Point de Monts, Province of Quebec, Canada; based chiefly upon the notes of Napoleon A. Comneau. Bull. Nutt. Orn. Club, vii. pp. 233–242.

——. Addenda to the Preliminary List of Birds ascertained to occur in the Adirondack Region, N.E. New York [Zool. Rec. xvii. *Aves*, p. 17]. *Tom. cit.* pp. 128, 256, 257.

MEYER, A. B. Weitere Untersuchungen der Herrn Krukenberg über die Farbstoffe der Vogelfedern. MT. orn. Ver. Wien, 1882, pp. 43 & 44.

An abstract account of Dr. Krukenberg's recent discoveries in regard to the colouring matter of feathers.

——. Ueber den Xanthochroismus der Papageien. SB. Ak. Berl. 1882, pp. 517–524.

——. Abbildungen von Vögel-Skeletten herausgegeben mit Unterstützung des Generals-direction der königl. Sammlungen für Kunst und Wissenschaft in Dresden. Pts. ii. & iii. pp. 9–24, pls. xi.–xxx. [*Gallinæ*, *Psittaci*, *Sturnidæ*, *Oriolidæ*, *Dicruridæ*, *Alcedinidæ*, *Cuculidæ*, *Columbidæ*.]

[See also *Striges*, *Psittaci*.]

[MILNE-EDWARDS, A.] & GRANDIDIER, A. Histoire Physique, Naturelle, et Politique de Madagascar. Vol. xii. Tome i. texte; 2e partie, dated on cover 1881; Vol. xiv. tome iii. atlas ii., 2e partie, dated on cover 1879; Vol. xv. tome iv. atlas iii., dated on cover 1881 [*cf.* Zool. Rec. xviii. *Aves*, p. 18].

As explained last year [*ibid.*] the parts of the above work, though bearing dates of years from 1879–82, were not really issued till 1882. A supplementary volume of plates was also published, to be exchanged for those previously given in the second tome of vol. i. of the atlas. The text of the ornithological portion of this great work is carried to the end of the Bulbuls [pp. 177–376], and the species figured are noticed under the heads of the families to which they belong.

MÜLLER, A. Die Ornis der Insel Salanga sowie Beiträge der Halbinsel Malakka. Eine zoogeographische Studie. J. f. O. 1882, pp. 352–448.

A very complete account of the Avifauna of Salanga Island, based on collections made by Capt. Weber. Some Tenasserim species range as far south, but, as might be expected, the Avifauna is essentially Malayan. 1 species described as new [*Picidæ*].

—— & K. Thiere der Heimath. Cassel: 1882.

——, ——. Ueber das wesen des Vogelzoges auf unserem Kontinente. Zool. Gart. xxiii. pp. 97–106, 148–154, 165–174.

Observations on migration of birds to Europe.

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——. Untersuchungen von Eischaalen, namenthiel von *Opisthocomus*, *Turnix*, und der sogenannten. Ueberzüge bei den Steganopoden und anderen Eiern, nebst Bemerkungen über die systematische Bedeutung dieser Structuren. *Tom. cit.* pp. 255–315.

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NEHRKORN, A. [See BLASIUS, W.]

NEHRLING, H. List of Birds observed at Houston, Harris Co., Texas, and vicinity, and in the counties Montgomery, Galveston, and Ford Bend. Bull. Nutt. Orn. Club, vii. pp. 6–13, 166–175, 222–225.

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NEWTON, A. A History of British Birds, by the late William Yarrell. 4th edition. Part xv. London: 1882, 8vo. [*cf.* Zool. Rec. xviii. *Aves*, p. 19], pp. 479–494.

With the *Picidæ*, which are here concluded, the second volume ends, and with it the editor's connection with the work. [See SAUNDERS, HOWARD.]

See also articles 'Killdeer,' 'King-bird,' 'Kingfisher,' 'Kinglet,' 'Kite,' 'Kiwi,' 'Knot,' 'Lämmergeyer,' 'Lapwing,' 'Lark,' 'Linnet,' in Encyclopædia Britannica, 9th ed., 1882, vol. xiv.

NICHOLSON, F. On Collections of Birds made by Mr. H. O. Forbes in South-eastern Sumatra. Ibis, 1882, pp. 51–65.

74 species recorded from the Lampong district.

——. Supplementary Notes to the List of Birds collected by Mr. H. O. Forbes in the Island of Java. *Tom. cit.* pp. 66–71.

In continuation of the author's former paper [Zool. Rec. xviii. *Aves*, p. 19]. The localities from which the specimens were sent were Bantam, the Preanger Regencies, and the Keeling Islands.

NUTTING, C. C. On a Collection of Birds from the Hacienda La Palma, Gulf of Nicoya, Costa Rica; with critical notes by R. Ridgway. P. U. S. Nat. Mus. v. pp. 382–409. [*Icteridæ*, *Tyrannidæ*.]

OATES, EUGENE W. A List of the Birds of Pegu. Str. Feath. x. 1882, pp. 1–248.

A revised catalogue of the Birds of Pegu, 454 species enumerated as believed by the author to occur on good authority. Mr. Hume, the editor of the Journal in which this paper appears, adds 16 species. [Cf. *Cuculidæ*, *Turdidæ*, *Timeliidæ*, *Ploceidæ*.]

OUSTALET, E. Notes d'Ornithologie. Bull. Soc. Philom. (7) vi. pp. 254–271. [*Muscicapidæ, Laniidæ, Pittidæ, Meropidæ, Phasianidæ.*]

OWEN, R. *Dinornis parvus*, sp. n. P. Z. S. 1882, pp. 1 & 2. [Abstract.]

——. On the Sternum of *Notornis*, and on Sternal Characters. *Tom. cit.* pp. 689–697. [See *Rallidæ*.]

A discourse on the term "*Ratitæ*," with reasons for the reduction undergone by the *Crista sterni* of various birds.

PALMÉN, J. A. Antvort an Herrn E. F. v. Homeyer bezüglich der "Zugstrassen der Vogel." Leipzig: 1882.

PARKER, T. J. [See *Rallidæ*.]

PAYNE-GALLWEY, R. The Fowler in Ireland, or Notes on the Haunts and Habits of Wildfowl and Seafowl, including instructions in the art of shooting and capturing them. London: 1882, 8vo, pp. i.–xiii. & 1–503.

Gives a great deal of new and interesting matter respecting the breeding, habits, and life-history of Irish wildfowl.

PELZELN, A. VON. Bericht über die Leistungen in den Naturgeschichte der Vögel während des Jahres 1880. Berlin: 1882, 8vo.

——. [See HOLUB, E.; MARSCHALL, A. F.]

PHILLIPS, E. C. The Birds of Breconshire. Zool. 1882, pp. 132–140, 213–220, 287–293.

A useful local list.

PIKE, T. M. A Visit to Loch Leven, Argyllshire. *Tom. cit.* pp. 281–286.

Refers to the ornithology of the district.

POTTS, T. H. Out in the Open: a Budget of Scraps of Natural History gathered in New Zealand. Christchurch, New Zealand: 1882, 8vo, pp. 301, with illustrations.

A reprint of articles contributed to the "New Zealand Country Journal," and some revised papers read before the Philosophical Societies of Wellington and Canterbury. Amongst the chapters may be cited those on the White Heron (pp. 1–8), New Zealand Hawks (pp. 37–50), the Bell Bird (pp. 113–116), Parrots (pp. 176–183), the Kea (pp. 184–193), rare or little-known New Zealand Birds (pp. 194–203), Seafowl of New Zealand (pp. 204–220).

PRYER, H. [See BLAKISTON, T. W.]

PUFAHL, T. Die Augen der Vögel. Z. Verh. Orn. Ver. Pomm. u. Mecklenb. No. 5, pp. 57–66 & 77–82.

Researches into the structure of the eye in birds, with illustrations of this organ in the Owls and Falcons.

Ramsay, E. P. Notes on the Zoology of the Solomon Islands. Part iv. P. Linn. Soc. N. S. W. vii. pp. 16–43.

Gives a complete list of the birds, 99 species in all, believed to inhabit the Solomon group. 5 are new, one re-named [*Meliphagidæ, Nectariniidæ, Campophagidæ, Psittaci*].

——. Contributions to Australian Oology. Part i. *Tom. cit.* pp. 45–59, pls. iii., iv., & v.

Eggs of the following species are described, and some of them figured, the plates, however, losing much of their interest from being uncoloured: *Halcyon pyrrhopygia, Dacelo leachi, Eurystomus pacificus, Pomatostomus rubeculus, P. ruficeps* (pl. iii. fig. 12), *Pachycephala olivacea, P. melanura, Pteropodocys phasianella* (pl. iii. fig. 1), *Myiagra concinna, Ephthianura tricolor, E. aurifrons, Malurus leuconotus, M. leucopterus, Pyrrholæmus brunneus* (pl. iii. fig. 8), *Sphenura brachyptera* (pl. iii. fig. 13), *Menura alberti* (pl. v. figs. 1 & 2), *M. victoriæ* (pl. iv. figs. 1–4), *Climacteris leucophæa, Philemon sordidus* (pl. iii. fig. 16), *Myzanthe flavigula, Eolophus roseicapilla, Platycercus pallidiceps, Milvus isurus* (pl. v. fig. 4), *Accipiter cirrhocephalus, Geopelia tranquilla, G. cuneata, Platalea flavipes, Nycticorax caledonicus, Botaurus australis, Butorides flavicollis, B. macrorrhyncha, Tribonyx ventralis* (pl. iii. fig. 5), *Gallinula tenebrosa, Porzana palustris* (pl. iii. fig. 14), *Scolopax australis* (pl. iii. fig. 15), *Ægialitis monacha, Cladorrhynchus pectoralis, Spatula rhynchotis, Malacorhynchus membranaceus, Casarca tadornoides, Nyroca australis, Sterna nereis.*

——. Notes on the Zoology of Lord Howe's Island. *Tom. cit.* pp. 86–90.

34 species of birds recorded, of which ten are supposed to be peculiar to the island.

——. Description of the Eggs of five species of Fijian Birds. *Tom. cit.* pp. 112–114. [*Timeliidæ, Artamidæ, Turdidæ, Procellariidæ.*]

——. Description of two new Birds from the Solomon Islands. *Tom. cit.* pp. 299–301. [*Dicruridæ, Columbæ.*]

——. Notes on the Zoology of the Solomon Islands, with descriptions of some new Birds. Part iii. *Tom. cit.* pp. 718–727.

Astur versicolor [*Accipitres*], *Ianthœnas philippinæ, Ptilopus richardsi, P. lewisi, Chalcophaps mortoni* [*Columbæ*], *Sturnoides minor* [*Meliphagidæ*] are described as new.

——. Description of two new Birds from the Solomon Islands. *Tom. cit.* pp. 833–835. [*Alcedinidæ, Muscicapidæ.*]

——, Note on the Range of *Pycnoptilus floccosus*, Gould, and *Pachycephala olivacea*, V. & H. *Tom. cit.* pp. 835 & 836. [*Timeliidæ, Laniidæ.*]

——. On a new species of *Eurystopodus*. Tom. cit. pp. 843–845.

——. Description of a new Species of Flycatcher, of the Genus *Monarcha* (*Piezorhynchus*) from the Solomon Group. P. Z. S. 1882, p. 711. [*Muscicapidæ.*]

[Ramsey, E. P.] Description of some new Birds from the Solomon Islands and New Britain. J. Linn. Soc. xvi. pp. 128–131. [*Accipitres, Muscicapidæ, Sturnidæ, Alcedinidæ, Columbæ.*]

——. [See also *Meliphagidæ.*]

——, Wardlaw, R. G. Descriptions of two new Species of Birds from Sumatra. Ann. N. H. (5) x. p. 431. [*Timeliidæ.*]

Rathbun, F. R. Bright Feathers, or some North American Birds of Beauty. Auburn, N. Y.: 1882, 4to, Parts iii. & iv. [*Mniotiltidæ, Fringillidæ.*]

Reichenow, A. Die Vögel der zoologischen Garten. Leitfaden zum Studium der Ornithologie mit besonderer Berücksichtigung der in Gefangenschaft gehaltenen Vögel. Ein Handbuch für Vogelwirthe. Theil i 1882, pp. 1–278.

Besides the short diagnoses of different species likely to be kept in confinement, the present work has a wider scope, and not only gives introductory remarks on each family, but even supplies a 'Stammbaum' (p. viii.), in which is sought to be shown the development of birds from early ancestry.

——. Neue Arten aus Ost-Africa, nebst einiger Bemerkungen über *Myrmecocichla nigra* (Vieill.). J. f. O. 1882, pp. 209–212. [See *Muscicapidæ, Fringillidæ, Paridæ, Timeliidæ, Prionopidæ, Turdidæ.*]

——. Vogelbilder aus fernen Zonen.

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Reinhardt, J. On the Remains of an extinct gigantic Bird supposed to be allied to *Cariama*, from the ossiferous caves of Brazil. Ibis, 1882, pp. 321–332.

A translation of the paper in the Danish Transactions [Zool. Rec. xviii. *Aves*, p. 22].

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——. Description of a new Flycatcher, and a supposed new Petrel from the Sandwich Islands. *Tom. cit.* pp. 337 & 338. [*Muscicapidæ, Procellariidæ.*]

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——. Descriptions of two new Thrushes from the United States. *Tom. cit.* pp. 374–379. [*Turdidæ.*]

[RIDGWAY, R.] On two recent additions to the North American Bird-fauna, by R. Belding. *Tom. cit.* pp. 414 & 415. [*Motacillidæ*, *Mniotiltidæ*.]

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——. On the genera *Harporhynchus*, Cabanis, and *Methriopterus*, Reichenbach, with a description of a new genus of *Mimidæ*. Tom. cit. pp. 43–46.

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——. Descriptions of some new North American Birds. *Tom. cit.* pp. 343–346. [*Certhiidæ*, *Paridæ*, *Mniotiltidæ*, *Rallidæ*.]

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——. Intorno ad una specie poco nota del genere *Cyclopsittacus*. Tom. cit. pp. 593–595. [*Psittaci*.]

——. Monografia del gen. *Casuarius*, Brips. Mem. Acc. Tor. (2) xxxiv. pp. 173–217, pls. i. & ii. [*Ratitæ*.]

——. Prodromus Ornithologiæ Papuasiæ et Moluccarum. xii. *Grallatores*. Ann. Mus. Genov. xviii. p. 318.

——. Prodromus Ornithologiæ Papuasiæ et Moluccarum. xi. (*Gallinæ*), xii. (*Grallatores*), xiii. (*Natatores*), xiv. (*Struthiones*), xv. (*additamenta*). Tom. cit. pp. 5–9, 318–337, 400–412, 414 & 415, 416–429. [*Scolopacidæ*, *Ardeidæ*.]

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This third volume brings this great work to a close, a work not only remarkable for the comprehensiveness of the treatment of the subject, but for the minute attention given by the author to every detail. In many cases of Papuan families and genera, the book is nothing less than a com-

[redacted]ograph. In the present volume, the author commences with the [redacted]*mbæ*, and treats of all the species down to the *Ratitæ*. Copious "Addenda" (pp. 501-597) bring the work up to the date of issue, and add several species described since the book was commenced. [*Muscicapidæ*, *Meliphagidæ*, *Parridæ*.]

SALVIN, O. A Catalogue of the Collection of Birds formed by the late H. E. Strickland. Cambridge: 1882, 8vo.

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——, ——. Notes on Birds from British Guiana. Ibis, 1882, pp. 76-84, pl. i.

[See *Myiadestidæ*, *Vireonidæ*, *Tyrannidæ*, *Pipridæ*, *Trochilidæ*, *Cypselidæ*, *Rhamphastidæ*, *Psittacidæ*.]

SAUNDERS, HOWARD. A History of British Birds, by the late William Yarrell. 4th edition, Part xv. London: 1882, 8vo. [*Cf.* Zool. Rec. xviii. *Aves*, p. 19.]

In continuation of Prof. Newton's edition, the editor here commences the third volume, and describes the *Columbæ* and the *Gallinæ* as far as *Tetrao*.

[See also *Laridæ*.]

SCHIER, WLADISLAW. Die Zugstrassen der Vögel in Böhmen. Blätter d. Böhm Vogelschutz-Verein. Prag, i., pp. 2-7, 17-22, 33-36, 49-55, 65-73, 81-88, 97-102, 113-123, 129-135, 145-151, 161-168, 176-185.

A most interesting series of articles on the migrations of wading and water birds in Bohemia, with a map of the country, showing the routes taken by some of the best known species, such as the Stork, Heron, Coot, etc. Woodcuts are added of several species, principally taken from Brehm's "Thierleben."

SCLATER, P. L. A Monograph of the Jacamars and Puff-birds, or Families *Galbulidæ* [q. v.] and *Bucconidæ* [q. v.]. Part vii. London: 1882, 4to.

——. Second Note on the species of the Tyrannine genus *Hirundinea*. Ibis, 1882, pp. 162-164. [See *Tyrannidæ*.]

——. On the term "Lipotype." P. Z. S. 1882, pp. 311 & 312.

"Lipotype" indicates a form that is conspicuous by its absence in certain zoological regions.

——. On two apparently new species of the Genus *Synallaxis*. Tom. cit. pp. 578 & 579, pl. xliii. [See *Dendrocolaptidæ*.]

——. Note on Rüppell's Parrot. *Tom. cit.* pp. 577 & 578, pl. xlii. [See *Psittaci*.]

——. [See also *Anatidæ*.]

——. [See WHITE, E. W.]

Scopoli, G. A. Ornithological Papers from his 'Deliciæ Floræ [illegible] Insubricæ.' Edited by A. Newton. Ticini: 1786–1788. [Willughby Society, reprint, 1882.]

Seebohm, H. Siberia in Asia: a Visit to the Valley of the Yenesay in East Siberia, with description of the Natural History, Migration of Birds, etc. London: 1882, 8vo, pp. i.–xviii. & 1–304.

Contains copious notes on the ornithology of the country visited by the author.

——. Notes on the Birds of Astrachan. Ibis, 1882, pp. 204–232.

Founded on Mr. Henke's observations, extending over eight years.

——. Further Contributions to the Ornithology of Japan. *Tom. cit.* pp. 368–371. [*Anseres*, *Fringillidæ*.]

——. Notes on the Birds of Archangel. Ibis, 1882, pp. 371–386, pl. xi.

A series of notes supplied by Mr. Henke, who resided at Archangel for many years. [See *Laniidæ*.]

——. Further Notes on the Ornithology of Siberia. Ibis, 1882, p. 419.

Describes two collections from Krasnoyarsk, and one from Samarcand.

——. On the Interbreeding of Birds. Ibis, 1882, pp. 546–550.

Examples are given of hybridism, between *Corvus corone* and *C. cornix*, *Carduelis major* and *C. caniceps*, *Cinclus cashmirensis* and *C. leucogaster*, etc., and of existing 'conspecies' in *Lanius excubitor* and its allies.

Sharpe, R. B. On the correct Generic and Specific Name of the Indian Shámá. Ann. N. H. (5) x. pp. 47–49. [*Timeliidæ*.]

——. Contributions to the Ornithology of New Guinea. Part vii. Diagnoses of new species of Birds from the back of the Astrolabe Range, S. E. New Guinea. J. L. S. xvi. pp. 317–319. [*Psittaci*, *Muscicapidæ*, *Campophagidæ*, *Laniidæ*, *Meliphagidæ*, *Timeliidæ*, *Fringillidæ*.]

——. Contributions to the Ornithology of New Guinea. Part viii. *Tom. cit.* pp. 422–447.

150 species enumerated, the majority procured by Mr. Goldie in the Astrolabe Mountains, though some are also recorded from Mr. Hunstein's collections in Milne Bay, on East Cape, etc., all localities in South-eastern New Guinea. [See *Muscicapidæ*, *Paradiseidæ*.]

——. On a new species of Sand-Martin (*Cotile*) from Madagascar. *Tom. cit.* p. 322. [*Hirundinidæ*.]

——. Bemerkungen über einige Afrikanische Timaliiden des Berliner Museums. J. f. O. 1882, pp. 344–347. [*Timeliidæ*.]

——. A Note on *Strix oustaleti*, Hartlaub. P. Z. S. 1882, p. 335.

——. On two apparently new species of *Erythropygia*. Tom. cit. pp. 588 & 589, pl. xlv. [See *Turdidæ*.]

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[illegible], R. B.] A Note on the genera *Schœnicola* and *Cutriscus*. Str. Feath. x. 1882, pp. 254–256.

A reprint of the paper noticed last year [Zool. Rec. xviii. *Aves*, p. 33].

——. [See also Gurney, J. H.]

——. [See Layard, E. L.]

Shelley, G. E. On a Collection of Birds made by Mr. J. S. Jameson in South-eastern Africa, with notes by Mr. T. Ayres. Ibis, 1882, pp. 235–265 & 350–368, pl. vii.

A very interesting paper, containing a record of no less than 219 species, principally from the Mashoona country, previously unvisited by the naturalist. Excellent field-notes are given by Mr. Ayres. [See *Cuculidæ*, *Certhiidæ*, *Muscicapidæ*, *Ploceidæ*, *Fringillidæ*.]

——. List of the Birds sent home by Mr. Joseph Thomson from the River Rovuma, East Africa. P. Z. S. 1882, pp. 302–304, pl. xvi.

43 species obtained, two being new (*Muscicapidæ*, *Meropidæ*).

——. A second List of Birds recently collected by Sir John Kirk in Eastern Africa. *Tom. cit.* pp. 304–310, pl. xvii.

34 species enumerated, two being new (*Emberizidæ*, *Alaudidæ*).

——. On some new species of Birds from South Africa. *Tom. cit.* pp. 336 & 337, pl. xviii. [See *Motacillidæ*, *Timeliidæ*.]

Schufeldt, R. W. Notes upon the Osteology of *Cinclus mexicanus*. Bull. Nutt. Orn. Club, vii. pp. 213–221.

The author believes that *Cinclus* is nearly allied to *Siurus*, and not far removed from some of the Wrens. [*Troglodytidæ*.]

——. The Number of Bones at present known in the Pectoral and Pelvic Limbs of Birds. Am. Nat. xvi. pp. 892–895.

Sesamoid bones are considered to be different from "any such ossifications as the tendons may assume." With regard to the tarsus certain discoveries are given, which show that the author is not quite familiar with the standard work on the 'carpus and tarsus.'

Simson, F. B. Notes on Birds found near Dacca, and in the surrounding District of Eastern Bengal. Ibis, 1882, pp. 84–95.

Slater, H. H. Notes on a Collection of Birds made on the River Yang-tse-Kiang. *Tom. cit.* pp. 431–436.

Stearns, R. E. C. The Acorn-storing Habit of the Californian Woodpecker. Am. Nat. xvi. pp. 353–357.

Stejneger, L. Description of two new races of *Myiadestes obscurus*, Lafr. P. U. S. Nat. Mus. iv. pp. 371–374. [*Myiadestidæ*.]

——. Synopsis of the West Indian *Myadestes*. Op. cit. v. pp. 15–27, pl. ii. [*Myiadestidæ*.]

——. On some Generic and Specific Appellations of North American and European Birds. *Tom. cit.* pp. 28–43.

The changes in nomenclature are numerous, and affect some of the commonest and best-known species [*cf.* Ibis, 1883, pp. 116 & 117].

[Stejneger, L.] Outlines of a Monograph of the *Cygninæ*. T[illegible] pp. 174–221. [*Anseres.*]

Stevenson, H. Ornithological Notes from Lowestoft, Suffolk. Zool. 1882, pp. 332–335, 429, & 430.

——. Ornithological Notes from Norfolk for 1880. *Tom. cit.* pp. 366–378.

——. [See *Procellariidæ.*]

Swinhoe, C. On the Birds of Southern Afghanistan. Ibis, 1882, pp. 95–126.

199 species observed. An important paper for students of bird-migration.

Taczanowski, C. Liste des Oiseaux recueillis par le Dr. Dybowski au Kamtschatka et dans les îles Comandores. Bull. Soc. Z. Fr. vii. p. 384.

67 species enumerated, two being new to science. [*Sittidæ*, *Paridæ*, *Fringillidæ.*]

——. Notice sur la Sittelle d'Europe (*Sitta europæa*). Tom. cit. pp. 425–429. [*Certhiimorphæ.*]

——. Liste des Oiseaux recueillis par M. Stolzmann au Pérou nord-oriental. P. Z. S. 1882, pp. 2–49, pls. i. & ii. [*Troglodytidæ*, *Tanagridæ*, *Dendrocolaptidæ*, *Formicariidæ*, *Trochilidæ*, *Picidæ.*]

Trimen, Roland. [See *Nectariniidæ.*]

Tristram, H. B. Description of a new species of Land-Rail from East Africa. [*Rallidæ.*]

——. Notes on a Collection of Birds from the Solomon Islands, with descriptions of new species. Ibis, 1882, pp. 133–146.

35 species enumerated, six being new [*Caprimulgidæ*, *Alcedinidæ*, *Meliphagidæ*, *Muscicapidæ*, *Columbidæ*]. A most useful list of the birds known to inhabit the group is given.

——. Ornithological Notes of a journey through Syria, Mesopotamia, and Southern Armenia in 1881. *Tom. cit.* pp. 402–419.

Interesting field notes.

Tschusi zu Schmidhoffen, V. Ritter von. Jahresbericht über den Vogelzug in Oesterreich und Ungarn (1881). MT. orn. Ver. Wien, 1882, pp. 19–23.

Turner, L. M. On *Lagopus mutus*, Leach, and its allies. P. U.S. Nat. Mus. v. pp. 225–233. [*Tetraonidæ.*]

White, E. W. Cameos from the Silver-land, or the experiences of a young Naturalist in the Argentine Republic. London: 1882, 8vo, vol. ii. pp. i.–xv. & 1–527.

——. Notes on Birds Collected in the Argentine Republic, with notes by P. L. Sclater. P. Z. S. 1882, pp. 591–629.

201 species recorded, with interesting field notes.

Vordeerman, A. G. Batavische Vogels. Tijdschr. Nederl. Ind. xli. pp. 181–211, xlii. pp. 1–97 & 192–239.

Articles on the life-history of Javan birds.

Williams, R. S. Notes on some Birds of the Belt Mountains, Montana Territory. Bull. Nutt. Orn. Club, vii. pp. 61–63.

Zeledon, J. C. Catalogo de las Aves de Costa Rica. San José, Costa Rica: 1882, 8vo, pp. 1–39.

711 species included.

ACCIPITRES.

Gurney, J. H. Notes on a 'Catalogue of the *Accipitres* in the British Museum,' by R. Bowdler Sharpe (1874). Ibis, 1882, pp. 146–162, 290–321, 436–452, 579–598, pl. x.

The review of the first volume of the 'Catalogue of Birds in the British Museum' is here concluded, and ornithologists are to be congratulated upon the fact that Mr. Gurney's unrivalled knowledge of the birds of prey has been published to the world.

——. Notes on the Raptorial Birds collected in New Britain by Lieut. G. E. Richards, R.N. Ibis, 1882, pp. 126–132.

Urospizias etorques, *Accipiter rubricollis*, *Henicopernis infuscata*, sp. n., described; *Strix aurantiaca* [Zool. Rec. xviii. *Aves*, p. 45], figured, pl. ii.

——. List of a collection of Raptorial Birds from the neighbourhood of Saigon, in Cochin China. Ibis, 1882, pp. 235 & 236.

16 species enumerated.

Menzbier, M. (*suprà*, p. 11).

Deals with the geographical distribution of *Accipitres* of European Russia. *Falco peregrinus brevirostris*, subsp. n. (p. 276), *Hierofalco uralensis*, sp. n. (p. 288, pl. iii.), *Aquila fulva* var. *alpina*, Sev. (p. 378), and *Aquila glitschii* (p. 387), described. *Falco abietinus*, Beckst., var. *griseiventris*, Brehm, figured (*id. op. cit.* pl. ii.), *F. peregrinus leucogenys*, male juv., figured (*id. op. cit.* pl. iv.), *Aquila orientalis*, figured (*id. op. cit.* pls. v.–vii.), *Buteo vulpinus*, figured (*id. op. cit.* pl. viii.).

FALCONES.

Cathartidæ.

Shufeldt, R. W. Osteology of the *Cathartidæ*. Rep. U. S. Geol. Surv. xii. pp. 727–786, pls. xv.–xxiv.

This elaborate and well illustrated paper confirms Professor Huxley's view of the New World Vultures being very distinct from their Old World allies.

Cathartes. On the presence of an "index" finger; W. A. Forbes, Am. Nat. xvi. pp. 141 & 142.

Falconidæ.

Sub-fam. Accipitrinæ.

Circus cyaneus, ♂ ad. & pull. figured; E. Booth, Rough Notes, pt. ii.

Circus melanoleucus. The female like the male; J. R. Cripps, Str. Feath. x. pp. 327 & 328.

Circus humbloti [sp. n. ?], figured; A. Milne-Edwards & A. Grandidier, Ois. Madag. pl. xxix.*a*, fig. 1; details of structure, *iid. tom. cit.* pls. xxix. *b*, fig. 1, xxix.*c*, fig. 1.

Circus maillardi, var. *macroscelis*, and *C. maillardi typicus*, figured; *iid. tom cit.* pls. xxix.*b*, figs. 2 & 3, xxix.*c*, figs. 2 & 3; *iid.* [re-issue] pls. xxvii., xxviii. fig. 2, xxviii. fig. 1.

Polyboroides radiatus var. *madagascariensis*, ad. & juv., figured; *iid. tom. cit.* pls. xv. & xvi. [re-issue]. Details of structure; *iid. tom. cit.* pl. xvi.*a*.

Melierax mechowi, sp. n., Angola; J. Cabanis, J. f. O. 1882, pp. 229 & 230.

Urospizias dampieri, sp. n., New Britain; J. H. Gurney, Ibis, 1882, p. 453.

Astur versicolor, sp. n., Ugi, Solomon Islands; E. P. Ramsay, P. Linn. Soc. N. S. W. vi. pp. 718–720 [= *A. albigularis*, Gray, *id. tom. cit.* p. 727, and Ibis, 1882, p. 345].

Astur pulchellus, sp. n., Solomon Islands, *id.* J. L. S. xvi. p. 131.

Astur henstii figured; A. Milne-Edwards & A. Grandidier, Ois. Madag. pl. xxx.*a* [re-issue].

Astur francesii figured; *iid. tom. cit.* pls. xxxi. & xxxii. fig. 1 [re-issue]. *A. moreli* figured; *iid. tom. cit.* pl. xxxii. fig. 2. Details of structure, *iid. tom. cit.* pl. xxxii.*a*.

Accipiter madagascariensis figured; *iid. tom. cit.* pl. xxxv. [re-issue].

Accipiter nisus, pull., figured; E. Booth, Rough Notes, pt. ii.

Sub-fam. Buteoninæ.

Buteo vulgaris, ♂ ad. & juv., figured; *id.* Rough Notes, pt. ii.

Buteo brachypterus figured; A. Milne-Edwards & A. Grandidier, Ois. Madag. pl. xxii [re-issue].

Sub-fam. *Aquilinæ*.

Aquila bonelii, in Bohemia; E. Hodek, MT. orn. Ver. Wien, 1882, p. 63; E. F. von Homeyer, J. f. O. 1882, pp. 317 & 318.

Nisaetus morphnoides, from S.E. New Guinea; R. B. Sharpe, J. L. S. xvi. p. 424.

Eutriorchis astur. Details of structure; A. Milne-Edwards & A. Grandidier, Ois. Madag, pl. ix.*c*.

Haliaetus vociferoides figured; *iid. tom. cit.* pl. ix. [re-issue].

Rostrhamus plumbeus, notes on; J. H. Gurney, Ibis, 1882, pp. 455 & 456.

FALCONIDÆ.

Machærhamphus alcinus, from Northern Borneo; R. B. Sharpe, P. Z. S. 1882, p. 688.

M. anderssoni figured; A. Milne-Edwards & A. Grandidier, Ois. Madag. pl. xxiv. [re-issue]. Details of structure; *iid. tom. cit.* pl. xxiv.*a*.

Elanus melanopterus figured; *iid. tom. cit.* pl. xxix.*a*, fig. 2.

Baza madagascariensis figured; *iid. tom. cit.* pl. xix. [re-issue]. Details of structure; *iid. tom. cit.* pl. xix.*a*.

Baza gurneyi, sp. n., Solomon Islands; E. P. Ramsay, J. L. S xvi. p. 130.

Falco peregrinus, ♂ ad. & pull., figured; E. Booth, Rough Notes, pt. ii. *F. atriceps* figured; J. H. Gurney, Ibis, 1882, pl. x.

Falco æsalon, imm., figured; E. Booth, Rough Notes, pt. ii.

Falco concolor, ad. & juv., figured; A. Milne-Edwards & A. Grandidier, Ois. Madag. pl. ii. [re-issue]. *F. zoniventris* figured; *iid. tom. cit.* pl. x. [re-issue].

Tinnunculus newtoni, figured; *iid. tom. cit.* pls. xiii. &. xiii.*a* [re-issue].

STRIGES.

BUBONIDÆ.

Bubo maculosus of South Africa occurring in Ireland; R. J. Ussher, Zool. 1882, pp. 460 & 461; J. E. Harting, P. Z. S. 1882, p. 688.

Strix scops. Its habits; Joh. v. Czato, MT. orn. Ver. Wien, 1882, pp. 13, 14, 24, & 25.

Scops kennicotti, and allies, notes on; W. Brewster, Bull. Nutt. Orn. Club, vii. pp. 27–33.

Scops asio bendirii, sp. n., Coast region of California, *id. tom. cit.* p. 31.

Scops manadensis figured; A. Milne-Edwards & A. Grandidier, Ois. Madag. pl. xl. [re-issue].

Heliodilus soumagnii. Details of structure; *iid. tom. cit.* pl. xxxvi.*d*, fig. 1.

Athene superciliaris figured; *iid. tom. cit.* pl. xxxix. [re-issue]. Details of structure; *iid. tom. cit.* pl. xxxvi.*d*. fig. 2.

Carine capensis figured; R. B. Sharpe, ed. Layard, B. S. Afr. pl. iii.

Ninox rudolphi, sp. n., Sumba Island, A. B. Meyer, Ibis, 1882, pp. 232 & 234, pl. vi.

Otus brachyotus, ♂ ad. & pull., and *O. vulgaris*, ♂ ad. & juv., figured; E. Booth, Rough Notes, pt. ii.

Asio capensis major and *A. madagascariensis* figured; A. Milne-Edwards & A. Grandidier, Ois. Madag. pls. xxxvii. & xxxviii. [re-issue].

Asio portoricensis, sp. n., Porto Rico, and its allies; R. Ridgway, P. U. S. Nat. Mus. iv. pp. 366–371.

Nyctale acadica. Its habits and changes of plumage; W. Brewster, Bull. Nutt. Orn. Club, vii. pp. 23–25.

PASSERIFORMES.

Corvidæ.

Corvus ossifragus. Notes on its ranges during winter; W. Dutcher, Tr. Linn. Soc. N. Y. i. pp. 108–111.

Corvus scapulatus. Details of structure; A. Milne-Edwards & A. Grandidier, Ois. Madag., pl. clxxvii.

Perisoreus canadensis nigricapillus, sp. n., Labrador; R. Ridgway, P. U. S. Nat Mus. v. p. 15.

Falculia palliata, ad. & juv. (pl. cxvii.), osteology (pls. cxviii. & cxix.), anatomy (pl. cxx.), details of structure (pl. cxvii. *a*); *iid. tom. cit.*

Paradiseidæ.

Ptilorrhis intercedens, sp. n., S.E. New Guinea; R. B. Sharpe, J. L. S. xvi. pp. 444 & 445.

Seleucides nigra. Its trachea; W. A. Forbes, P. Z. S. 1882, pp. 333–335.

Phonygama hunsteini, sp. n, S. E. New Guinea [? Normanby Island], R. B. Sharpe, J. L. S. xvi. pp. 442 & 443.

Diphyllodes chrysoptera, from S. E. New Guinea, *id. tom. cit.* pp. 443 & 444.

Oriolidæ.

Oriolus formosus. Skeleton figured; A. B. Meyer, Abbild. Vogelsk. pl. xxv.

Dicruridæ.

Dicrurus (*Chibia*) *longirostris*, sp. n., San Christoval, Solomon Islands, E. P. Ramsay, P. Linn. Soc. N. S. W. vii. pp. 300 & 301.

Dicrurus leucops. Skeleton figured; A. B. Meyer, Abbild. Vogelsk. pl. xxvi. fig. 1.

Dicrurus forficatus. Details of structure; A. Milne-Edwards & A. Grandidier, Ois. Madag. pl. cxlv. *a*, fig. 4. Ad. figured; *iid. tom. cit.* pl. cliii. Skeleton; *iid. tom. cit.* pl. cliii.

Prionopidæ.

Bradyornis grisea, sp. n., A. Reichenow, J. f. O. 1882, p. 211. [? = *B. murina*, F. & H.]

Eurycerus prevosti. Adult figured (pl. clxxii.); skeleton (pls. cxxliii., clxxiv., clxxv.); anatomy (pl. clxxvi.); details of structure (pl. clxxii. *a*); A. Milne-Edwards & A. Grandidier, Ois. Madag.

Leptopterus chabert. Adult and young figured (pl. clviii.); skeleton (pl. clix.); details of structure (pl. cliv. *a*, fig. 2); *iid. tom. cit.*

Campophagidæ.

Campophaga cinerea. Adult figured (pl. clxiii.); details of structure (pl. clvi. *a*, fig. 2); *iid. tom. cit.*

Graucalus kochi, sp. n., Mindanao; H. Kuttar, Orn. Centralbl. 1882, p. 183.

Edoliisoma tristrami; new name for *E. solomonis*, Tristr., nec *Graucalus solomonis*, Ramsay; E. P. Ramsay, P. Linn. Soc. N. S. W. vii. p. 22.

Edoliisoma poliopse, sp. n., Astrolabe Mountains, S. E. New Guinea, R. B. Sharpe, J. L. S. xvi. p. 318.

Edoliisoma montanum and *Graucalus maforensis* figured; J. Gould, B. N. Guin. pt. xiii.

Muscicapidæ.

Muscicapa infulata, sp. n., Magungo, Equatorial Africa, G. Hartlaub, Abh. Ver. Brem. vii. p. 98. *M. ussheri*, sp. n., Gold Coast, R. B. Sharpe, P. Z. S. 1882, pp. 590 & 591.

Pratincola indica and *P. maura* at Gilgit, J. Biddulph, Ibis, 1882, pp. 272–276.

Pœcilodryas albifacies, sp. n., Astrolabe Mountains, S. E. New Guinea, R. B. Sharpe, J. Linn. Soc. xvi. p. 318; figured, J. Gould, B. N. Guin. pt. xiii.

Cyanoptila cyanomelæna in Siam, E. Oustalet, Bull. Soc. Philom. (7) vi. p. 263.

Erythrocercus thomsoni, sp. n., River Rovuma, East Africa, G. E. Shelley, P. Z. S. 1882, p. 303, pl. xvi. fig. 2.

Parisoma boehmi, sp. n., A. Reichenow, J. f. O. 1882, p. 209, Seke, Ugo.

Newtonia brunneicauda figured; A. Milne-Edwards & A. Grandidier, Ois. Madag. pl. cxlv. fig. 1. Details of structure; *iid. tom. cit.* pl. cxlv. *a*. fig. 1. Skeleton; *iid. tom. cit.* pl. cxlvi.

Monachella muelleriana figured; J. Gould, B. N. Guin. pt. xiii.

Æthomyias guttata, sp. n., R. B. Sharpe, J. L. S. xvi. pp. 432 & 433, Astrolabe Mountains, S. E. New Guinea.

Chasiempis sclateri, sp. n., Sandwich Islands, R. Ridgway, P. U. S. Nat. Mus. iv. p. 337.

Hypothymis rowleyi figured; J. Gould, B. N. Guin. pt. xiii.

Myiagra cerviniventris, ♂ described; E. P. Ramsay, P. Linn. Soc. N. S. W. vi. p. 726.

Terpsiphone mutata. Details of structure; A. Milne-Edwards & A. Grandidier, Ois. Madag. pl. cxlv. *a*, fig. 3. ♂ & ♀ figured; *iid. tom. cit.* pls. cxlvii. & cxlviii. Skeleton: *iid. tom. cit.* pl. cxlix.

Pseudobias wardi figured; *iid. tom. cit.* pl. cxlv. fig. 2. Details of structure; *iid. tom. cit.* pl. cxlv. *a*, fig. 2. Skeleton; *iid. tom. cit.* pl. cxlvi. *a*.

Rhipidura finschi, sp. n., New Britain, T. Salvadori, Ucc. Papuasia, iii. Add. p. 532.

Rhipidura tenebrosa, sp. n., St. Christoval, Solomon Islands, E. P. Ramsay, P. Linn. Soc. N. S. W. vi. p. 835. *R. lenzi*, sp. n., Celebes, W. Blasius, Orn. Centralbl. 1882, p. 171.

Pomarea (*Monarcha*) *ugiensis*, Ugi, Solomon Islands, *id.* J. L. pp. 128 & 129.

Monarcha (*Piezorrhynchus*) *browni*, sp. n., Solomon Islands, *id.* P. Z. S. 1882, p. 711.

Monarcha periophthalmicus, sp. n., Astrolabe Mountains, S. E. New Guinea, R. B. Sharpe, J. L. S. xvi. p. 318.

Piezorrhynchus squamulatus, sp. n., Ugi, Solomon Islands, H. B. Tristram, Ibis, 1882, p. 136. [? = *P. brodiei* (Zool. Rec. xvi. *Aves*, p. 48), E. P. Ramsay, *tom. cit.* p. 472.]

Turdidæ.

Aedon psammochroa, Rchnw., = *A. familiaris*, R. B. Sharpe, J. f. O. 1882, p. 345.

Merula vitiensis and *M. ruficeps*. Eggs described; E. P. Ramsay, P. Linn. Soc. N. S. W. vii. pp. 113 & 114.

Merula flavirostris graysoni, sp. n., Tres Marias Islands, R. Ridgway, P. U. S. Nat. Mus. v. p. 12.

Peliocichla, g. n., *P. schuetti*, Angola, *P. saturata*, spp. nn., Cameroons, *P. bocagii*, Angola; J. Cabanis, J. f. O. 1882, pp. 317–321.

Hylocichla fuscescens salicicola, Rocky Mountains, *H. aliciæ bicknelli*, subspp. nn., Slade Mountains, N. Y., R. Ridgway, P. U. S. Nat. Mus. iv. pp. 374–379. Remarks on habitats of the latter species; E. B. Bicknell, Bull. Nutt. Orn. Club, vii. pp. 152–159, *id.* Tr. Linn. Soc. N. Y. i. p. 141.

Tribura intermedia, Oates, = *T. taczanowskii*, Swinh.; E. W. Oates, Str. Feath. x. p. 218.

Saxicola seebohmi, sp. n., Aures Mountains, Algeria, C. Dixon, Ibis, 1882, pl. xiv.

Cyanecula wolfi in Scotland, J. A. Harvie-Brown, Scot. Nat. vi. pp. 203–206; *id.* Ibis, 1882, p. 179.

Sialia sialis guatemalæ, sp. n., Guatemala and Honduras, R. Ridgway, P. U. S. Nat. Mus. v. p. 13.

Pycnonotidæ.

Hemixus sumatranus and *Criniger sumatranus*, spp. nn., Sumatra, R. G. Wardlaw Ramsay, Ann. N. H. (5) x. p. 431.

Hypsipetes madagascariensis. Details of structure (pl. cxli. *a*, fig. 1).

Tylas madagascariensis. Details of structure (pl. cxli. *a*, fig. 2). *T. edwardi*, var. *strophiatus* figured (pl. cxliv. *a*).

Irena cyanogastra and *I. melanochlamys* figured; J. Gould, B. Asia, pt. xxxiii.

Troglodytidæ.

Troglodytes bewickii leucogaster nesting in N. Arizona; E. Coues, Bull. Nutt. Orn. Club, vii. pp. 52 & 53.

Troglodytes (?) *ochraceus*, sp. n., Costa Rica, R. Ridgway, P. U. S. Nat. Mus. iv. pp. 334 & 335.

[Ha]rgyothorus albiventris, sp. n., Chirimoto, N. E. Peru, L. Taczanowski, P. Z. S. 1882, p. 5.

Sphenocichla humii and *S. roberti* figured; J. Gould, B. Asia, pt. xxxiii.

Mimidæ.

Methiopterus curvirostris occidentalis, sp. n., coast region of Western Mexico; *Mimus gilvus lawrencii*, sp. n., Tehuantepec; R. Ridgway, P. U. S. Nat. Mus. v. pp. 9–12.

Methriopterus and *Harporhynchus*; characters of genera. *Mimodes*, g. n. Type, *M. graysoni*, id. *tom. cit.* pp. 43–46.

Cinclidæ.

Cinclus aquaticus breeding in Middlesex; R. H. Mitford, Zool. 1882, p. 109.

Cinclus mexicanus: its anatomy; R. W. Shufeldt, Bull. Nutt. Orn. Club, vii. pp. 213–221.

Myiadestidæ.

Stejneger, L. Synopsis of the West Indian *Myiadestes*. P. U. S. Nat. Mus. v. pp. 15–27.

Eight species recognized:—*M. sanctæ luciæ*, Santa Lucia (p. 20, pl. ii. fig. 4), *M. dominicanus*, sp. n., Dominica (p. 22, pl. ii. fig. 5); coloured figures of the heads of six species are given.

Myiadestes obscurus, var. *occidentalis*, S. W. Mexico and Guatemala, and var. *insularis*, Tres Marias Islands; L. Stejneger, P. U. S. Nat. Mus. iv. pp. 372 & 373.

Cichlopsis gularis, sp. n., British Guiana, O. Salvin & F. D. Godman, Ibis, 1882, p. 76.

Timeliidæ.

Group Thamnobiæ.

Pentholæa clericalis, sp. n., Upper Nile, G. Hartlaub, Orn. Centralbl. 1882, p. 91; *id.* J. f. O. 1882, p. 34.

Cittocincla. Remarks on the nomenclature of the species; R. B. Sharpe, Ann. N. H. (5) x. pp. 47–49.

Copsychus albo-specularis. Details of structure (pl. cxxviii. *a*, fig. 3).

Cossypha imerina. Details of structure (pl. cxxxviii. *a*, fig. 1), ♀ figured (pl. cxl. *a*, fig. 1). *C. sharpii*: details of structure (pl. cxxxviii. *a*, fig. 2), ♀ figured (pl. cxl. *a*, fig. 2); A. Milne-Edwards & A. Grandidier, Ois. Madag.

Saxicola arnotti, Tristr., *S. shelleyi*, Sharpe, *M. leucolæma*, Rchnw., *M. collaris*, sp. n., are all referable to *Myrmecocichla nigra* (V.). *M. levaillanti*, sp. n., S. E. Africa, A. Reichenow, J. f. O. 1882, pp. 211 & 212.

Thamnobia quadrivirgata, Rchnw., is a *Cossypha*; R. B. Sharpe, J. f. O. 1882, p. 344. *T. simplex* is an *Erythropygia*; id. *tom. cit.* p. 345.

Erythropygia rufícauda, sp. n., Congo, and *E. zambesiana*, sp. [illegible] Zambesi, R. Bowdler Sharpe, P. Z. S. 1882, pp. 588 & 589, pl. xl[illegible] figs. 1 & 2.

Group Bradypteri.

Sphenœacus natalensis and *S. intermedius*, spp. nn., Natal and Kaffraria, G. E. Shelley, P. Z. S. 1882, p. 337.

Dromœocercus brunneus. Details of structure (pl. cxxviii. *a*, fig. 2), A. Milne-Edwards & A. Grandidier, Ois. Madag.

Dromœocercus seebohmi figured; *iid. tom. cit.* pl. cxxxi. *a*.

Ellisia madagascariensis. Details of structure (pl. cxxvi. *a*, fig. 1); *iid. tom. cit.*

Eminia, g. n. Type, *E. lepida*, sp. n., Magungo, Equatorial Africa, G. Hartlaub, Abh. Ver. Brem. vii. p. 91. [Is an *Apalis*; R. B. Sharpe, Cat. B. vii. p. 140.]

Drymocichla, g. n. Type, *D. incana*, sp. n., Magungo, Equatorial Africa, *id. tom. cit.* pp. 91 & 92.

Dryodromas flavida (Strickl.) is a *Euprinodes*; R. B. Sharpe, J. f. O. 1882, p. 346. *E. flavo-cincta*, sp. n., E. Africa, *id. tom. cit.* p. 346.

Dryodromas melanurus, sp. n., Angola, J. Cabanis, *tom. cit.* p. 349.

Tricholais citriniceps, sp. n., Kakoma, C. Africa, A. Reichenow, *tom. cit.* p. 210 [= *Eremomela pulchra* (Bocage); Sharpe, Cat. B. vii. p. 162].

Tricholais flavo-torquata, sp. n., Magungo, Equatorial Africa; G. Hartlaub, Abh. Ver. Brem. vii. p. 95 [is *Eremomela caniceps* (Cass.); Sharpe, Cat. B. vii. p. 164].

Thamnornis, g. n. Type, *T. chloropetoides* (Grand.); A. Milne-Edwards & A. Grandidier, Ois. Madag. texte, 2e partie, pp. 335 & 336. Details of structure (pl. cxxviii. *a*, fig. 1).

Eroessa tenella var. *major* figured; *iid. tom. cit.* pl. cxiii. *a*, fig. 1. *E. tenella typica* and *E. tenella major*: details of structure; *iid. tom. cit.* pl. cxiii. *b*, figs. 1 & 2.

Camaroptera sundevalli, sp. n. (= *C. olivacea*, Sundev., *nec* V.), R. B. Sharpe, J. f. O. 1882, p. 347.

Group Cisticolæ.

Cisticola marginalis (nec Heugl.), sp. n., Lado, Equatorial Africa, G. Hartlaub, Abh. Ver. Brem. vii. pp. 89 & 90. [*C. hartlaubi*, Sharpe, Cat. B. vii. p. 243, note.]

Cisticola hypoxantha, sp. n., Magungo, Equatorial Africa, *id. tom. cit.* p. 89 [= *C. rufa* (Fraser), juv.; R. B. Sharpe, Cat. B. vii. p. 252].

Cisticola erythrocephala, Jerd., = *C. volitans*, Swinh.; the sexes differ: E. W. Oates, Str. Feath. x. 1882, pp. 219 & 220.

Drymœca holubi, sp. n., Matabele Land; A. von Pelzeln, Beitr. orn. Südafr. p. 76, pl. i. [= *Cisticola ruficapilla* (Smith); Sharpe, Cat. B. vii. p 283]

Drymœca pyrrhoptera, sp. n., Simbareni, C. Africa, A. Reichenow,

p. 210 [= *Orthotomus erythropterus* (Jard.)]. *D. undosa*, sp. n., Kkoma, *id. tom. cit.* p. 211.

Drymœca flavicans figured; R. B. Sharpe, ed. Layard, B. S. Afr. pl. viii.

Group Chamæ.

Chamœa fasciata henshawi, sp. n., San Francisco Bay, R. Ridgway, P. U. S. Nat. Mus. v. pp. 13 & 14.

Group Crateropodes.

Sibia melanoleuca, *Trochalopteron melanostigma*, *Actinodura ramsayi*, figured; J. Gould, B. Asia, pt. xxxiii.

Group Timeliæ.

Eupetes pulcher, sp. n., Astrolabe Mountains, S. E. New Guinea, R. B. Sharpe, J. L. S. xvi. p. 319 [= *E. castanonotus*, Salvad.; *id.* in Gould's B. New Guinea, pt. xiii.].

Mystacornis crossleyi. Details of structure; *iid. tom. cit.* pl. cxxi.*c*, fig. 2.

Bernieria madagascariensis, ♂ ♀ (figs. 1 & 2), *B. zosterops*, ♂ ♀ (figs. 3 & 4), *B. caniceps*, details of structure, *B. madagascariensis* (pl. cxxiii.*b*), and *B. zosterops* (pl. cxxv.*a*), skeletons figured; *iid. tom. cit.*

Crossleyia xanthophrys. Details of structure; *iid. tom. cit.* pl. cxxvi.*a*, fig. 3.

Oxylabes madagascariensis. Details of structure (pl. cxxvi.*a*, fig. 2), skeleton (pl. cxxvi.*b*.); *iid. tom. cit.*

Oxylabes cinereiceps figured; *iid. tom. cit.* pl. cxiii.*a*, fig. 2.

Vitia ruficapilla. Eggs described; E. P. Ramsay, P. Linn. Soc. N. S. W. vii. p. 112.

Pycnoptilus floccosus. Its range in New South Wales; *id. op. cit.* vi. pp. 835 & 836.

Orthonyx spinicauda is not congeneric with *O. ochrocephala*, and the latter bird should be referred to the genus *Clitonyx*. Neither of them are Tracheophonine birds, but belong probably to the *Timeliidæ*. W. A. Forbes, P. Z. S. 1882, pp. 544–546.

Accentoridæ.

Accentor rufilatus = *A. nipalensis*, J. Biddulph, Ibis, 1882, p. 281. *A. fulvescens* figured; *id. tom. cit.* pl. viii.

Paridæ.

Parus pleskii, var. figured; M. Menzbier, Orn. Geograph. Evrop. Ross. pl. i.

Parus griseiventris, sp. n., Kakoma, C. Africa, A. Reichenow, J. f. O. 1882, p. 210.

Pœcilia kamtschatkensis and its allies; L. Taczanowski, Bull. Soc. Z. Fr. vii. pp. 390–392.

Ægithalus musculus, sp. n., Upper Nile, G. Hartlaub, Orn. Ce[illegible] 1882, p. 91 ; *id.* J. f. O. 1882, p. 326.

Lophophanes inornatus griseus, subsp. n., California, R. Ridgway, P. U. S. Nat. Mus. v. p. 344.

Laniidæ.

Pachycephala olivacea. Its range in New South Wales; E. P. Ramsay, P. Linn. Soc. N. S. W. vi. p. 836.

Pachycephalopsis poliosoma, sp. n., Astrolabe Mountains, New Guinea, R. B. Sharpe, J. L. S. xvi. p. 318; figured, J. Gould, B. N. Guin. pt. xiii. *P. hattamensis* figured, J. Gould, *l. c.*

Hyloterpe philippinensis, figured, *id.* B. Asia, pt. xxxiii.

Lanius. Notes on the species of the Canary Islands; E. Oustalet, Bull. Soc. Philom. (7) vi. pp. 268–271.

Lanius gubernator, sp. n., Upper Nile, G. Hartlaub, Orn. Centralbl. 1882, p. 91 ; *id.* J. f. O. 1882, p. 323.

Lanius mollis figured ; H. Seebohm, Ibis. 1882, pl. xi.

Lanius pyrrhostictus, sp. n., Transvaal, E. Holub & A. von Pelzeln, Beitr. orn. Südafr. p. 97, pl. ii. [= *Lanius collaris*, ♀].

Lanius cephalomelas. Its habitat; H. Schalow, J. f. O. 1882, p. 12[illegible]

Laniarius blanfordi, sp. n., Abyssinia, *L. ussheri*, sp. n., Gold Coast, R. B. Sharpe, ed. Layard, B. S. Afr. p. 397, note.

Dryoscopus cinerascens, sp. n., Lado, Equatorial Africa, G. Hartlaub, Abh. Ver. Brem. vii. pp. 93 & 94.

Artamia leucocephala. Adult figured (pl. cliv.), skeleton (pl. clv.), details of structure (pl. cliv.*a*, fig. 1); A. Milne-Edwards & A. Grandidier, Ois. Madag.

Cyanolanius bicolor. Adult figured (pl. clvi.), skeleton (pl. clvii.), details of structure (pl. clvi.*a*, fig. 1) ; *iid. tom. cit.*

Oriolia bernieri. Male and female figured (pl. clxii.), details of structure (pl. cliv.*a*, fig. 3); *iid. tom. cit.*

Lantzia rufa. Male and female figured (pl. clx.), details of structure (pl. clx.*a*, fig. 1) ; *iid. tom. cit.*

Vanga curvirostris. Adult figured (pl. clxvi.), skeleton (pls. clxi. & clxvii.), details of structure (pl. clx.*a*, fig. 2) ; *iid. tom. cit.*

Xenopirostris lafresnayi. Adult figured (pl. clxviii.), skeleton (pl. clxxi.), details of structure (pls. clxx.*a*, fig. 1, clxx.*b*, fig. 1) ; *iid. tom. cit.*

Xenopirostris polleni. Adult figured (pl. clxix.), details of structure (pls. clxx.*a*, fig. 2, clxx.*b*, fig. 2) ; *iid. tom. cit.*

Xenopirostris damii. Adult figured (pl. clxx.), details of structure (pls. clxx.*a*, fig. 3, clxx.*b*, fig. 3); *iid. tom. cit.*

Calicalus madagascariensis. Male and female figured (pl. clxiv.), skeleton (pl. clxv.), details of structure (pl. clxiv.*a*, fig. 1) ; *iid. tom. cit.*

Vireonidæ.

Vireo huttoni stephensi, sp. n., Arizona and New Mexico, W. Brewster, Bull. Nutt. Orn. Club, vii. pp. 142–144.

...us leucotis and *V. icterophrys*, not distinct from *V. leucotis*; ...alvin & F. D. Godman, Ibis, 1882, p. 77.

Hylophilus viridiflavus figured; *iid.* Biol. Centr. Am. pt. xv., *Aves*, pl. xiii. fig. 1.

Neochloe brevipennis figured, *iid. tom. cit.* pl. xiii. fig. 2.

CERTHIIDÆ.

RIDGWAY, R. Critical Remarks on the Tree-Creepers (*Certhia*) of Europe and North America. P. U. S. Nat. Mus. v. pp. 111–116.

Seven species recognized: *C. familiaris*, *C. costæ*, *C. britannica*, subsp. n., *C. rufa*, *C. montana*, subsp. n., Central Province of N. America, *C. occidentalis*, subsp. n., Pacific Coast of N. America, *C. mexicana*.

Sitta europea. Its variation in Europe; L. Taczanowski, Bull. Soc. Z. Fr. vii. pp. 425–429.

Sitta albifrons, sp. n., Kamtschatka, *iid. tom. cit.* pp. 385–387.

Hylypsornis salvadorii, from the Mashoona country; G. E. Shelley, Ibis, 1881, p. 255.

Hypherpes corallirostris, ♀ figured; A. Milne-Edwards & A. Grandidier, Ois. Madag, pl. cxxi. ♂ figured (pl. xii. *a*), skeleton (pl. cxxi. *b*), details of structure (pl. cxxi.c, fig. 1); *iid. tom. cit.*

Ca...rpes mexicanus punctulatus, sp. n., California, R. Ridgway, P. U. S. Nat. Mus. v. pp. 343 & 344.

NECTARINIIDÆ.

Nectarinia souimanga (fig. 1), *N. notata* (fig. 2), *Neodrepanis coruscans* (fig. 3): details of structure; A. Milne-Edwards & A. Grandidier, Ois. Madag., pl. cvi.*a*. *N. coruscans*, ♀ figured; *iid. tom. cit.* pl. cvii.*b*.

Cinnyris erikssoni, sp. n., Mossamedes, R. Trimen, P. Z. S. 1882, pp. 451 & 452.

Cinnyris melanocephalus [nom. emend. pro *C. dubia* (Zool. Rec. xvi. *Aves*, p. 43)], E. P. Ramsay, P. Linn. Soc. N. S. W. vii. p. 28.

Anthreptes orientalis, sp. n., Lado, Equatorial Africa, G. Hartlaub, Abh. Ver. Brem. vii. p. 109.

MELIPHAGIDÆ.

Zosterops palpebrosus in Sind; J. Murray, Str. Feath. x. 1882, p. 328.

Zosterops delicatula, sp. n., Astrolabe Mountains, S. E. New Guinea; R. B. Sharpe, J. L. S. xvi. p. 318.

Zosterops rendovæ [nom. emend. pro *Tephras olivaceus*, Ramsay (Zool. ...c. xviii. *Aves*, p. 37]; H. B. Tristram, Ibis, 1882, p. 135.

Tephras (*Zosterops*) *ugiensis* (nom. emend. pro *Tephras olivacea*, Ram...y [*ut suprà*]), E. P. Ramsay, P. Linn. Soc. N. S. W. vii. p. 28. [Renamed *Zosterops ramsayi*, T. Salvadori, Ucc. Papuasia, iii. App. p. 546.]

Tephras whitii, sp. n., Aru Islands?, E. P. Ramsay, P. Z. S. 1882, p. 357. [= *Glycychera fallax*, Salvad., Ucc. Papuasia, iii. Add. p. 543.]

Melilestes poliopterus, sp. n., Astrolabe Mountains, S. E. New Guinea, R. B. Sharpe, J. L. S. xvi. p. 318.

Ptilotis marmorata, sp. n., Astrolabe Mountains, S. E. Ne
id. tom. cit. p. 319.

Plectorrhyncha (?) *fulviventris*, sp. n., S. E. New Guinea, E. P. Ramsay, P. Linn. Soc. N. S. W. vi. pp. 718 [? *Euthyrrhynchus*, T. Salvadori, Ucc. Papuasia, iii. Add. p. 544.

Stigmatops blasii, Amboina; T. Salvadori, Ucc. Papuasia, iii. Add. pp. 543 & 566.

Sturnoides minor, sp. n., S. Christoval, Solomon Islands, E. P. Ramsay, P. Linn. Soc. N. S. W. vi. pp. 726 & 727.

Hirundinidæ.

Chelidon cashmirensis and *C. urbica* in Gilgit; J. Biddulph, Ibis, 1882, p. 269.

Hirundo tytleri from Munipur; H. H. Godwin-Austen, Ibis, 1882, p. 346.

Phedina borbonica var. *madagascariensis* figured; A. Milne-Edwards & A. Grandidier, Ois. Madag. pl. cl. Skeleton, *iid. tom. cit.* pl. cli. Details of structure; *iid. tom. cit.* pl. clxiv.*a*, fig. 2.

Cotile cowani, sp. n., Betsileo Country, Madagascar, R. B. Sharpe, J. L. S. xvi. p. 322.

Motacillidæ.

Motacilla ocularis in Lower California; R. Ridgway, P. U. S. Nat. Mus. iv. p. 414.

Motacilla flaviventris (pl. cxxxiii.), skeleton (pl. cxxxiv. fig. 2); A. Milne-Edwards & A. Grandidier, Ois. Madag.

Anthus butleri, sp. n., Natal, G. E. Shelley, P. Z. S. 1882, p. 336, pl. xviii. [= *Anthus chloris*, Licht.].

Mniotiltidæ.

Dendræca chrysoparia, in S. W. Texas; N. C. Brown, Bull. Nutt. Orn. Club, vii. pp. 36 & 37.

Dendræca æstiva figured; F. R. Rathbun, Bright Feath. pt. iv.

Dendræca vicilloti bryanti in Lower California; R. Ridgway, P. U. S. Nat. Mus. iv. pp. 414 & 415.

Helminthophila, nom. emend. pro *Helminthophaga*, Cab.; E. Coues, Bull. Nutt. Orn. Club, vii. pp. 53 & 54.

Geothlypis beldingi, sp. n., Lower California, R. Ridgway, P. U. S. Nat. Mus. v. pp. 344 & 345.

Icteridæ.

Icterus oberi figured; T. Grisdale, Ibis, 1882, p. 487, pl. xiii.

Icterus pectoralis espinachi, Nutting, P. U. S. Nat. Mus. v. pp. 392 & 393.

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Diva branickii, sp. n., N. E. Peru, *id. l. c.* p. 10, pl. i. fig. 2.

Chlorospingus speculiferus. Its nest; J. Gundlach, J. f. O. 1882, p. 161.

Pyranga roseigularis. Female described; G. N. Lawrence, Ann. N. Y. Ac. ii. p. 247.

Fringillidæ.

Goniaphea. Note on the generic term; P. L. Sclater, Ibis, 1882, p. 182.

Loxigilla portoricensis var. *grandis*, sp. & subsp. nn., St. Christopher, W. I., G. N. Lawrence, P. U. S. Nat. Mus. iv. pp. 204 & 205.

Carduelis elegans albigularis [Zool. Rec. xviii. *Aves*, p. 38] from Hungary; J. v. Madarász, J. f. O. 1882, pp. 12 & 13.

Chrysomitris tristis figured; F. R. Rathbun, Bright Feath. pt. iii.

Poliospiza reichardi, sp. n., Kakoma, C. Africa, A. Reichenow, J. f. O. 1882, p 210.

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Loxia. Remarks on the genus; A. Dubois, Bull. Mus. Belg. pp. 81–87. The author recognizes the following species and races: — i. *L. pytiopsittacus*; ii. *L. crucirostra* (with varr. *americana*, *mexicana*, *himalayana*); iii. *L. leucoptera* (with varr. *bifasciata* and *amurensis*, sp. n.)

Pyrrhula rosacea, sp. n., Japan, H. Seebohm, Ibis, 1882, p. 371.

Pyrrhula kamtschatkensis, sp. n., Kamtschatka, L. Taczanowski, Bull. Soc. Z. Fr. i. p. 395.

Emberizidæ.

Peucæa ruficeps eremœca, sp. n., Texas, N. C. Broun, Bull. Nutt. Orn. Club, vii. p. 26.

Fringillaria orientalis, sp. n., Mamboio, East Africa, G. E. Shelley, P. Z. S. 1882, p. 308; *F. forbesi*, sp. n., Upper Nile, G. Hartlaub, J. f. O. 1882, p. 324.

Emberiza rustica in Yorkshire; W. E. Clarke, Ibis, 1882, p. 182.

Ploceidæ.

Ploceus sakalava. Male and female figured (pl. clxxviii.) details of structure (pl. clxxvii. *a*, fig. 1); A. Milne-Edwards & A. Grandidier, Ois. Madag.

Ploceus pensilis. Male and female figured (pl. clxxix.), skeleton (pl. clxxx.), details of structure (pl. clxxvii. *a*, fig. 2); *iid. tom. cit.*

Ploceus madagascariensis. Male and female figured (pl. clxxxi.), skeleton (pl. clxxxii.), details of structure (pl. clxxvii. *a*, fig. 3); *iid. tom. cit.*

Hyphantornis crocata, sp. n., Magungo, Equatorial Africa, G. Hartlaub, Abh. Ver. Brem. vii. p. 100.

Hyphantica cardinalis, sp. n., Lado, *id. tom. cit.* p. 102.

Sharpia ayresi, sp. n., Mashoona Country, G. E. Shelley, [illegible] p. 353, pl. vii. fig. 2.

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Urobrachia mechowi, sp. n., Angola (= *U. bocagii*, Sharpe, 1871), and *U. affinis*, sp. n., ? S. W. Africa; J. Cabanis, J. f. O. 1882, pp. 121 & 122.

Urobrachia zanzibarica, Shelley, = *U. phœnicea*, Heugl.; *id. tom. cit.* p. 122.

Hyphantornis emini, sp. n., Upper Nile, G. Hartlaub, Orn. Centralbl. 1882, p. 92; *id.* J. f. O. 1882, p. 322, pl. i. fig. 1.

Erythrura cyanifrons distinct from *E. trichoa*; H. B. Tristram, Ibis, 1882, p. 180.

Sorella, g. n. Type, *S. emini*, sp. n., Lado, Equatorial Africa, G. Hartlaub, Abh. Ver. Brem. vii. p. 104.

Munia grandis, sp. n., Astrolabe Mountains, S. E. New Guinea, R. B. Sharpe, J. L. S. xvi. p. 319.

Ægintha luchsi, sp. n., W. Africa, K. Russ, Gef. Welt, 1882, p. 6.

Spermestes nana. Male and female figured (pl. clxxxiii. figs. 1 & 2), details of structure (pl. clxxvii. *a*, fig. 4); A. Milne-Edwards and A. Grandidier, Ois. Madag.

Pytelia cinereigula, Cab., = *P. wieneri*, Finsch; A. F. Wiener, Gef. Welt, 1882, p. 175.

Lagonosticta jamesoni, sp. n., Mashoona Country, G. E. Shelley, Ibis, 1882, p. 355.

Uroloncha swinhoii, sp. n., China, J. Cabanis, J. f. O. 1882, pp. 462 & 463.

Habropyga cinochroa, sp. n., Upper Nile, G. Hartlaub, Orn. Centralbl. 1882, p. 91; *id.* J. f. O. 1882, p. 322.

Alaudidæ.

Alauda hova. Adult figured (pl. clxxxiii. fig. 3), skeleton (pl. clxxxiv.), details of structure (pl. clxxvii. *a*, fig. 5); A. Milne-Edwards & A. Grandidier, Ois. Madag.

Mirafra torrida, sp. n., Ugogo, East Africa, G. E. Shelley, P. Z. S. 1882, p. 308, pl. xvi.

Galerida miramaræ, sp. n., S. Spain, F. von Homeyer, J. f. O. 1882, pp. 315–317.

Eremophila alpestris. Osteology; R. W. Shufeldt, Rep. U. S. Geol. Surv. xii. pp. 627–650, pl. iv.

Artamidæ.

Artamus mentalis. Eggs described; E. P. Ramsay, P. Linn. Soc. N. S. W. vii. p. 113.

Sturnidæ.

Hartlaubius madagascariensis, ♂ and ♀ (pl. cxv.), osteology (pl. cxvi.) figured; details of structure: A. Milne-Edwards & A. Grandidier, Ois. Madag. pl. cxiii. *b*, fig. 3.

...ostrum dubium and *Streptocitta torquata*. Skeletons figured; B. Meyer, Abbild. Vogelsk. pls. xxiv. & xxv.

Calornis (*Aplonis*) *feadensis*, sp. n., Fead Island, E. P. Ramsay, J. L. S. xvi. p. 129.

Macruropsar magnus figured; J. Gould, B. N. Guin. pt. xiii.

Lamprocolius sycobius figured; E. Holub & A. von Pelzeln, Beitr. Orn. Sudafr. pl. iii.

Pipridæ.

Pipra chlorion from British Guiana is replaced in Colombia and Ecuador by *P. tschudii*; O. Salvin & F. D. Godman, Ibis, 1882, p. 78.

Pipra suavissima, sp. n., British Guiana, *iid. l. c.* p. 79, pl. i.

Dendrocolaptidæ.

Acanthidops bairdi, g. & sp. nn., Costa Rica, R. Ridgway, P. U. S. Nat. Mus. iv. pp. 335 & 336.

Synallaxis fusco-rufa, sp. n., Sierra Nevada of Santa Marta, and *S. grisco-murina*, sp. n., Ecuador, P. L. Sclater, P. Z. S. 1882, pp. 578 & 579, pl. xliii. figs. 1 & 2.

Synallaxis cisandina and *S. fuscata*, spp. nn., N. E. Peru, L. Taczanowski, P. Z. S. 1882, p. 25.

Xiphocolaptes compressirostris, sp. n., N. E. Peru, *id. tom. cit.* p. 28.

Picolaptes peruvianus, sp. n., N. E. Peru, *id. ibid.*

Tyrannidæ.

Cnipolegus cabanisi, Tucuman, F. Schulz, J. f. O. 1882, p. 462.

Hirundinea. Notes on the genus, with corrections of the synonymy of the three species known; P. L. Sclater, Ibis, 1882, pp. 162–164.

Platyrrhynchus saturatus, sp. n., British Guiana, O. Salvin & F. D. Godman, Ibis, 1882, p. 78.

Mitrephanus, nom. emend. for *Mitrephorus*, Sclater; E. Coues, Bull. Nutt. Orn. Club, vii. p. 55.

Ornithium imberbe ridgwayi, sp. n., Arizona, W. Brewster, Bull. Nutt. Orn. Club, vii. pp. 208–210.

Myiarchus nuttingi, sp. n., Costa Rica, R. Ridgway, P. U. S. Nat. Mus. v. pp. 395 & 396.

Formicariidæ.

Thamnophilus loretoyacuensis, sp. n., E. Peru, E. Bartlett, P. Z. S. 1882, p. 374.

Thamnophilus subandinus, sp. n., N. E. Peru, L. Taczanowski, P. Z. S. 1882, p. 29.

Myrmeciza maynana, sp. n., N. E. Peru, *id. tom. cit.* p. 32.

Chamæza fulvescens, sp. n., British Guiana, O. Salvin & F. D. Godman, Ibis, 1882, p. 79.

Grallaria przewalskii and *G. minor*, spp. nn., N. E. Peru, L. Taczanowski, P. Z. S. 1882, p. 33.

Herpsilochmus puncticeps, sp. n., N. E. Peru, *id. tom. cit.* p. 50
Formicarius pallidus, sp. n., Yucatan, G. N. Lawrence, Ann. N. Y
Ac. ii. p. 388.

Xeniscidæ.

Xeniscus and *Acanthisitta* proved to be Mesomyodian birds and not *Oscines*; W. A. Forbes, P. Z. S. 1881, pp. 569–571.

Pittidæ.

Pitta kochi. Young described; E. Oustalet, Bull. Soc. Philom. (7) vi. pp. 256–259.

Philepitta castanea and *P. schlegeli*. Details of structure; A. Milne-Edwards & A. Grandidier, Ois. Madag. pl. cxi. *a*. ♀ (pl. cix. fig. 1), ♂ (pl. cx.), osteology (pl. cxii.); *P. schlegeli* ♀ (pl. cix. fig. 2), ♂ (pl. cxi.), figured, *iid. tom. cit.*

PICARIÆ.

Trochilidæ.

Heliodoxa xanthogonys, sp. n., British Guiana, O. Salvin & F. D. Godman, Ibis, 1882, p. 80.

Urosticte intermedia, sp. n., N. E. Peru, L. Taczanowski, P. Z. S. 1882, p. 36.

Amazilia yucatanensis distinct from *A. cerviniventris*; R. Ridgway, P. U. S. Nat. Mus. iv. pp. 25 & 26.

Eriocnemis dybowskii, sp. n., N. E. Peru, L. Taczanowski, P. Z. S. 1882, p. 39.

Doryphora euphrosine is probably *Hemistephania johannæ*, ♀; O. Salvin & F. D. Godman, Ibis, 1882, p. 80.

Lophornis pavoninus, sp. n., British Guiana, *iid. tom. cit.* p. 81.

Cypselidæ.

Cypselus balstoni said to be the young of *C. apus*; A. Milne-Edwards & A. Grandidier, Ois. Madag. texte, 2e partie, p. 189.

Cypselus caffer breeding in the Congo district; R. B. Sharpe, P. Z. S. 1882, p. 688.

Nephœcetes niger borealis. Note on plumage; F. M. Drew, Bull. Nutt. Orn. Club, vii. pp. 182 & 183.

Collocalia cebuensis, sp. n., Cebu, Rutter, J. f. O. 1882, pp. 171–17
C. marginata, sp. n., Cebu, *id. tom. cit.* p. 448.

Chætura pelasgia. Its nest; T. Meehan, P. Ac. Philad. 1882, pp. 215 & 216. *C. zaumeri*, sp. n., Yucatan, G. N. Lawrence, Ann. N. York Ac. ii. pp. 245 & 246.

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Chætura rutila distinct from *C. brunneitorques*; O. Salvin & F. D. Godman, Ibis, 1882, p. 82. *C. boehmi*, sp. n., Rakowa, E. Africa, H. Schalow, Orn. Centralbl. 1882, p. 183.

Caprimulgidæ.

Caprimulgus nobilis, sp. n., Rendova, Solomon Islands, H. B. Tristram, Ibis, 1882, p. 134, pl. iii.

Eurostopodus nigripennis, sp. n., Miranda, Solomon Islands, E. P. Ramsay, P. Linn. Soc. N. S. W. vi. pp. 843–845.

Alcedinidæ.

Corythornis cristata figured; A. Milne-Edwards & A. Grandidier, Ois. Madag. pl. xc. (re-issue).

Alcyone richardsi, sp. n., Rendova, Solomon Islands, H. B. Tristram, Ibis, 1882, p. 134, pl. iv.

Ispidina madagascariensis. Details of structure; A. Milne-Edwards & A. Grandidier, Ois. Madag. pls. lxxxix. *a* & cxvii. *a*, fig. 2.

Ceyx sacerdotis, sp. n., New Britain, E. P. Ramsay, J. L. S. xvi. p. 128.

Halcyon solomonis, sp. n., Solomon Islands, *id.* P. Linn. Soc. N. S. W. vi. pp. 833 & 834. [? = *H. juliæ*, juv.; H. B. Tristram, Ibis, 1882, p. 609.]

Halcyon quadricolor figured; J. Gould, B. N. Guin. pt. xiii.

Tanysiptera danae figured; J. Gould, B. N. Guin. pt. xiii. *T. galatea*, skeleton figured; A. B. Meyer, Abbild. Vogelsk. pl. xxvii. fig. 1.

Cittura sanghirensis. Skeleton figured; A. B. Meyer, Abbild. Vogelsk. pl. xxvi. fig. 2.

Sauromarptis gaudichaudi. Skeleton figured; *id. tom. cit.* pl. xxvii. fig. 2.

Melidora macrorrhina figured; J. Gould, B. N. Guin. pt. xiii.

Meropidæ.

Merops revoillii, sp. n., E. Oustalet, Bull. Soc. Philom. (7) vi. pp. 255 & 256.

Merops dresseri, sp. n., River Rovuma, East Africa; G. E. Shelley, P. Z. S. 1882, p. 303, August [= *M. boehmi*, Reichenow, J. f. O. 1882, p. 233]. *Cf.* Dresser, P. Z. S. 1882, p. 634.

Merops madagascariensis, var. *superciliosus*, figured; A. Milne-Edwards & A. Grandidier, Ois. Madag. pl. xc. [re-issue].

Todidæ.

Forbes, W. A. On some points in the Anatomy of the Todies (*Todidæ*), and on the Affinities of that Group. P. Z. S. 1882, pp. 442–450.

The *Todidæ* are intermediate between the *Piciformes* and the *Passeriformes*. Group of *Todiformes* proposed, consisting of Todies only, equivalent to *Passeriformes*, *Piciformes*, and *Cypseliformes*.

Bucconidæ.

Sclater, P. L. A Monograph of the Jacamars and Puff-birds. Part vii. 1882.

The work completed. *Chelidoptera tenebrosa* and *C. brasiliensis* figured.

Galbulidæ.

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The work completed.

Coraciidæ.

Leptosomus discolor. Details of structure; A. Milne-Edwards & A. Grandidier, Ois. Madag. pls. lxxxiv.*a* & civ.*b*, fig. 1.

Brachypteracias pittoides. Skeleton figured; *iid. tom. cit.* pl. civ. *a*. Details of structure; *iid. tom. cit.* pl. civ.*c*. fig. 2.

Brachypteracias squamigera. Details of structure; *iid. ibid.* pl. civ.*b*, fig. 2.

Brachypteracias crossleyi. Details of structure; *iid. ibid.* pl. civ.*c*. fig. 1.

Eurystomus pacificus in New Zealand; T. F. Cheeseman, Tr. N. Z. Inst. xiv. p. 265.

Bucerotidæ.

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The work completed.

Penelopides affinis figured; *id. tom. cit.* pt. ix.

Buceros silvestris figured; *id. tom. cit.* pt. ix.

Tockus deckeni and *T. hartlaubi* figured; *id. tom. cit.* pt. ix.

Anorrhinus austeni figured; *id. tom. cit.* pt. x.

Hydrocorax semigaleatus figured; *id. tom. cit.* pt. x.

Bucanistes cylindricus (pt. ix.), *B. subquadratus* (pt. x.), figured; *id. tom. cit.*

Limonophalus, g. n. Type, *L. montani* (Oust.), figured; *id. tom. cit.* pt. x.

Pholidophalus sharpii (pt. ix.) and *P. casuarinus* (pt. x., head), figured; *id. tom. cit.*

Upupidæ.

Upupa epops in Madagascar; A. Milne-Edwards & A. Grandidier, Ois. Madag., texte, 2e partie, pp. 269 & 270.

Picidæ.

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A monographic sketch of this obscure genus, commencing with a review of the identifications by Malherbe and Sundevall. 21 species are recognized.

Iyngipicus nanus, Vig., is not *I. hardwickii*, auct., but a distinct species from the N. W. Himalayas; E. Hargitt, *l. c.* p. 38. *I. picatus*, sp. n., N. W. Borneo; *id. l. c.* p. 41. *I. sondaicus*, Wall., = *I. auritus*, Eyton;

[illegible] *c.* p. 42. *I. grandis*, sp. n., Lombok & Flores; *id. tom. cit.* p. 45. [illegible] *peninsularis*, sp. n., S. India; *id. tom. cit.* p. 48.

Iyngipicus ramsayi, *I. temminckii*, *I. aurantiiventris*, *I. darriesi*, and *I. scintilliceps*, figured; J. Gould, B. Asia, pt. xxxiii.

Melanerpes formicivorus. Its habits; R. E. C. Stearns, Am. Nat. xvi. pp. 353–357.

Gecinus weberi, sp. n., Salanga Islands, A. Müller, J. f. O. 1882, pp. 421–424.

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Centurus rubriventris. Female described; G. N. Lawrence, Ann. N. York Ac. ii. p. 247.

Capitonidæ.

Trachyphonus versicolor, sp. n., Upper Nile, G. Hartlaub, Orn. Centralbl. 1882, p. 91; *id.* J. f. O. 1882, p. 326.

Rhamphastæ.

Aulacorrhamphus whitelianus, sp. n., British Guinea, O. Salvin & F. D. Godman, Ibis, 1882, p. 83.

Cuculidæ.

Cuculus canorus. Nesting habits; A. Roth, Gef. Welt, 1882, pp. 305–307.

Cuculus poliocephalus figured; A. Milne-Edwards & A. Grandidier, Ois. Madag. pl. lxvi. [re-issue].

Cuculus audeberti (pl. lxvi. *a*), details of structure (pl. lxvi. *b*); *iid. tom. cit.*

Chrysococcyx basalis, Horsf., and *C. malayanus*, Raffl., are the ♀ of *C. xanthorrhynchus*, Horsf.; E. W. Oates, Str. Feath. 1882, pp. 193–195.

Pachycoccyx, g. n. Type, *Cuculus validus*, Rchnw.; J. Cabanis, J. f. O. 1882, p. 230. *Cercococcyx mechowi*, g. & sp. nn., *id. tom. cit.* p. 230.

Centropus natalensis, sp. n., Natal and Transvaal, G. E. Shelley, Ibis, 1882, p. 246.

Centropus madagascariensis, juv. figured (pl. lxvii.), ad. var. (pl. lxviii.), *id. tom. cit.* [re-issue].

Coua serriana (pl. xlii.), *C. reynaudi* (pl. xliii.), *C. cristata typica*, (pl. xliv.), *C. cristata*, var. *pyropyga* (pl. xlv.), *C. verreauxi* (pl. xlvii.), *C. cærulea* (pl. xlviii.), *C. delalandii* (pl. l.), *C. gigas* (pl. li.), *C. ruficeps* (pl. liii.), *C. olivaceiceps* (pl. liv.), *C. cursor* (pl. lvii.), *C. coquereli* (pl. lviii.), figured; *iid. tom. cit.* [re-issue].

Coua reynaudi (pl. xli. *b*. fig. 1), *C. pyropyga* (pl. xli. *b*, fig. 2), *C. verreauxi* (pl. xli. *b*, fig. 3), *C. coquereli* (pl. xli. *b*, fig. 4), *C. pyropyga*, (pl. xli. *c*, fig. 1), *C. delalandii* (pl. xli. *c*. fig. 2), details of structure; *iid. tom. cit.*

Lepidogrammus cumingi. Skeleton figured; A. B. Meyer, A[illegible] Vogelsk. pl. xxviii.

Coccyzus americanus and *C. erythrophthalmus*. Nesting habits; O. Widman, Bull Nutt. Orn. Club, vii. pp. 56 & 57; W. Brewster, *l. c.*

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Coracopsis obscura and *C. nigra* figured; A. Milne-Edwards & A. Grandidier, Ois. Madag. pls. i. & ii. [re-issue]. Details of structure (pl. i.*a*), *iid. tom. cit.*

Cyanorhamphus saisseti figured; P. L. Sclater, P. Z. S. 1882, p. 630, pl. xlvi.

Trichoglossus goldiei, sp. n., Astrolabe Mountains, S. E. New Guinea, R. B. Sharpe, J. L. S. xvi. p. 317.

Nymphicus uvæensis, sp. n., Uvéa, Loyalty Islands, E. L. Layard, P. Z. S. 1882, p. 408, pl. xxvi. fig. 2. *N. cornutus*, head figured; *id. tom. cit.* pl. xxvi. fig. 1.

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Nasiterna mortoni, sp. n.?, Solomon Islands, E. P. Ramsay, P. Linn. Soc. N. S. W. vii. p. 35. *N. finschi*, ♂ described, *id. op. cit.* vi. pp. 720 & 721.

Conurus egregius [Zool. Rec. xviii. *Aves*, p. 44]. Its habitat British Guiana; O. Salvin & F. D. Godman, Ibis, 1882, p. 83.

Stringops habroptilus, *Cacatua sulphurea*, *C. citrino-cristata*, *Eclectus polychlorus*, *Cyclopsitta lunulata*, *Loriculus exilis*, *Nasiterna pygmæa*, *Nestor meridionalis*, *Trichoglossus meyeri*. Skeletons figured; A. B. Meyer, Abbild. Vogelsk. pls. xvii.–xxiv.

COLUMBÆ.

Columbidæ.

Columba livia, var. "*Ægyptisches mövchen*," A. B. Meyer, Abbild. Vogelsk. pl. xxx.

...ptila fulviventris, sp. n., Yucatan, G. N. Lawrence, Ann. N. York Ac. ii. p. 287.

Turtur picturatus. Adult figured (pl. clxxxv.), skeleton (pl. clxxxvi.), osteology (pl. clxxxvii.); A. Milne-Edwards & A. Grandidier, Ois. Madag. *T. humilis* from Gilgit; J. Biddulph, Ibis, 1882, p. 286.

Turacœna crassirostris. Notes on its anatomy; W. A. Haswell, P. Linn. Soc. N. S. W. vii. p. 116.

Æna capensis. Adult figured (pl. clxxxviii.), osteology (pl. clxxxix.); A. Milne-Edwards & A. Grandidier, Ois. Madag.

Chalcophaps mortoni, sp n., Ugi, Solomon Islands, E. P. Ramsay, P. Linn. Soc. N. S. W. vi. p. 725.

Phlogœnas salamonis, sp. n., San Christoval, Solomon Islands, *id. op. cit.* vii. pp. 299 & 300.

Carpophaga pinon. Skeleton figured; A. B. Meyer, Abbild. Vogelsk. pl. xxix.

Carpophaga finschi, sp. n., New Britain, E. P. Ramsay, J. L. S. xvi. pp. 129 & 130.

Carpophaga paulina from Luzon; J. Cabanis, J. f. O. 1882, pp. 125 & 126. *C. nuchalis*, sp. n., Luzon, *id. tom. cit.* p. 126.

Ianthœnas philippanæ, sp. n., Ugi, Solomon Islands, E. P. Ramsay, P. Linn. Soc. N. S. W. vi. pp. 722 & 723.

Ptilopus rhodostictus, sp. n., Ugi, Solomon Islands, H. B. Tristram, Ibis, 1882, p. 139, pl. v.

Ptilopus lewisi, sp. n., Florida and Malangtan, Solomon Islands, E. P. Ramsay, P. Linn. Soc. N. S. W. vi. p. 724.

Ptilophus eugeniæ, juv. described; *id. ibid.*

Ptilophus corriei is perhaps *Columba tannensis*, Lath.; *id.* Ibis, 1882, p. 344.

Œdirhinus insolitus. Notes on anatomy; W. A. Haswell, P. Linn. Soc. N. S. W. vii. pp. 115 & 116.

Faningus madagascariensis figured (pls. cxc. *a*, fig. 1, & cxciii.), skeleton (pl. cxciv.), osteology (pl. cxcv.); A. Milne-Edwards & A. Grandidier, Ois. Madag.

Vinago australis, adult figured (pl. cxc.), skeleton (pl. cxci.), osteology (pl. cxcii.), details of structure (pl. cxc. *a*, fig. 1); *id. tom. cit.*

Otidiphaps cervicalis and *Eutrygon terrestris* figured; J. Gould, B. N. Guin. pt. xiii.

Pteroclidæ.

Pterocles. On the systematic position of the genus; H. Gadow, P. Z. S. 1882, pp. 312–332.

Pterocles is intermediate between the *Columbæ* and *Gallinæ*, at the same time connecting these groups with the *Charadromorpha*. The retention of the term *Pterocleles* is advisable. The *Columbæ* and *Gallinæ* have descended from a common stock.

Pterocles personatus, ♂ & ♀ figured (pl. cxcvi.), skeleton (pl. cxcvii.), osteology (pl. cxcviii.); A. Milne-Edwards & A. Grandidier, Ois. Madag.

GALLINÆ.

Phasianidæ.

Argus rheinardi, sp. n., Tong-king, Maingonnat, Bull. Soc. Z. Fr. vii. p. xxv. [= *Argus ocellatus*.] Type of *Rheinhardius*, Oustalet, Ann. Sci. Nat. *id.* Bull. Soc. Philom. (7) vi. pp. 254 & 255.

Polyplectron emphanum in Luzon; E. Oustalet, Bull. Soc. Philom. (7) vi. pp. 259 & 260.

Phasianus humiæ figured; H. H. Godwin-Austen, P. Z. S. 1882, pp. 715–718, pl. li.

Gallus domesticus var. ("Crevecœur-Henne" & "Kampfhahn von Manilla," "Englischer Kampfhahn," "Malayen-Hahn," "Japanische Zwerghahn"), skeletons figured; A. B. Meyer, Abbild. Vogelsk. pls. xi.–xv.

Peloperdix charltoni in Spain; E. Oustalet, Bull. Soc. Philom. (7) vi. pp. 265 & 266.

Margaroperdix striata, male figured (pl. cxcix.), female (pl. cc.), skeleton (pl. cci.), osteology (pl. cci. *a*), details of structure (pl. cc. *a*); A. Milne-Edwards & A. Grandidier, Ois. Madag.

Francolinus ochrogaster, Upper Nile, G. Hartlaub, J. f. O. 1882, p. 327.

Numida tiarata, adult figured (pl. cciv.), skeleton (pl. ccv.), osteology (pls. ccvi. & ccviii.); Milne-Edwards & Grandidier, *l. c.*

Tetraonidæ.

Lagopus scoticus. On the variations in its plumage; T. E. Buckley, P. Z. S. 1882, pp. 112–116.

Tetrao tetrix, skeleton, *T. urogallus*, head; A. B. Meyer, Abbild. Vogelsk. pl. xvi.

Lagopus mutus and allies (*L. mutus rupestris*, *L. mutus reinhardti*, and *L. mutus atkhensis*, sp. n., Atkha Island, L. M. Turner, P. U. S. Nat. Mus. v. pp. 225–233.

Turnicidæ.

Turnix saturata, sp. n., New Britain, W. A. Forbes, Ibis, 1882, p. 428, pl. xii. List of species of *Turnix*, id. *tom. cit.* pp. 429–431.

Turnix nigricollis. Male and female figured (pl. cciii.), osteology (pl. cciii.); A. Milne-Edwards & A. Grandidier, Ois. Madag.

GERANOMORPHÆ.

Rallidæ.

Rallus madagascariensis. Adult figured (pl. ccxxxi.), details of structure (pl. ccxxx. *b*, fig. 1); *iid.* tom. cit. *R. gularis*: adult figured (pl. ccxxxii.), details of structure (pl. ccxxx. *b*, fig. 2), *iid. tom. cit.*

R. beldingi, sp. n., Lower California, R. Ridgway, P. U. S. Nat. Mus. v. pp. 345 & 346.

Lanthrallus griscofrons. Adult figured (pl. ccxxxiii.), skeleton (pl. ccxxxiii. *a*), osteology (ccxxxiii. *b*), details of structure (pl. ccxxx. *b*, fig. 3) ; *iid. tom. cit.*

Ortygometra insularis. Adult figured (pl. ccxxxv.), details of structure (pl. ccxxx. *b*, fig. 5) ; *iid. tom. cit.*

Ortygometra watersi. Adult figured (pl. ccxxxiv.), skeleton (pl. ccxxxvi.), details of structure (pl. ccxxx. *b*, fig. 4) ; *iid. tom. cit.*

Crex suahelensis, sp. n., Ribé, E. Africa, H. B. Tristram, P. Z. S. 1882, p. 93.

Porzana bailloni in Ireland, A. G. More, Zool. 1882, pp. 114 & 115.

Porphyrio smaragnotus. Adult figured (pl. ccxlii.), skeleton (pl. ccxliii.), osteology (pl. ccxliv.) ; A. Milne-Edwards & A. Grandidier, Ois. Madag.

Notornis mantelli. A third specimen obtained ; W. L. Buller, Tr. N. Z. Inst. xiv. p. 238, A. Newton, P. Z. S. 1882, p. 97, A. B. Meyer, Ibis, 1882, p. 607. Skeleton described ; T. J. Parker, Tr. N. Z. Inst. xiv. p. 245.

Porphyrio alleni. Adult figured (pl. ccxl.) ; *iid. tom. cit.*

Notornis mantelli. The sternum described ; R. Owen, P. Z. S. 1882, pp. 689–697. The sternum figured in Tr. N. Z. Inst. iv. pl. iv. figs. 5–8, does not belong to this bird ; A. Newton, P. Z. S. 1882, p. 97.

Gallinula chloropus var. *pyrrhorhoa*. Adult figured (pl. ccxl.), skeleton (pl. ccxli.), osteology (pl. ccxli. *a*) ; A. Milne-Edwards & A. Grandidier, Ois. Madag.

Otididæ.

Otis (*Lophotis*) *fulvicrista*, sp. n., Bendera, East Africa, J. Cabanis, Orn. Centralbl. 1882, p. 14.

LIMICOLÆ.

Parridæ.

Parra albinucha. Adult figured (pl. ccxxxvii.), skeleton (pl. ccxxxviii.), osteology (pl. ccxxxix.) ; A. Milne-Edwards & A. Grandidier, Ois. Madag.

Hydralector novæ hollandiæ, sp. n., Australia, T. Salvadori, Orn. Papuasia, iii. p. 308.

Glareolidæ.

Glareola ocularis. Adult figured (pl. cclvi.), skeleton (pl. cclvii.), osteology (pl. cclviii.) ; Milne-Edwards & Grandidier, *l. c.*

Glareola nuchalis liberiæ, sp. n., Liberia, H. Schlegel, Notes Leyd. Mus. iii. p. 58.

Glareola ocularis. Its egg described ; J. E. Harting, P. Z. S. 1882, p. 353.

Charadriidæ.

Charadrius (*Ægialitis*) *bifrontatus*, sp. n., Madagascar, J. Cabanis, Orn. Centralbl. 1882, p. 14 ; *id.* J. f. O. 1882, p. 124.

Ægialitis geoffroyi. Its egg described ; J. E. Harting, P. Z. S. 1882, p. 355.

Charadrius fulvus in New Zealand ; T. F. Cheeseman, Tr. N. Z. Inst. xiv. p. 264.

Scolopacidæ.

Himantopus autumnalis. Adult figured (pl. cclix.); A. Milne-Edwards & A. Grandidier, Ois. Madag.

Scolopax rusticula carrying its young: R. J. Ussher, Zool. 1882, pp. 306 & 307, and R. E. Reeves, *tom. cit.* pp. 307 & 308.

Neoscolopax, g. n. Type, *N. rochusseni* (Schleg.); T. Salvadori, Ann. Mus. Genov. xviii. p. 331.

Philohela minor carrying its young; F. L. Harvey, Am. Nat. xvi. p. 738.

Gallinago macrodactyla. Its egg described; J. E. Harting, P. Z. S. 1882, p. 355.

Gallinago nigripennis var. *bernieri.* Adult figured (pl. cclx.); A. Milne-Edwards & A. Grandidier, Ois. Madag.

Rhynchæa capensis. Adult figured (pl. cclxi.); *iid. tom. cit.*

Totanus solitarius at Scilly; T. Cornish, Zool. 1882, p. 434.

Limosa rufa. Skeleton; A. Milne-Edwards & A. Grandidier, Ois. Madag. pl. cclv.

Numenius arquatus var. *madagascariensis.* Adult figured; *iid. tom. cit.* pl. ccliv.

Numenius borealis in Scotland; G. Sim, Scot. Nat. vi. p. 13.

Eurhinorrhynchus pygmæus in Alaska; T. H. Bean, P. U. S. Nat. Mus. v. p. 165.

Dromadidæ.

Dromas ardeola. Skeleton (pl. cclii.), osteology (pl. ccliii.); A. Milne-Edwards & A. Grandidier, Ois. Madag.

GAVIÆ.

Laridæ.

Saunders, Howard. On some *Laridæ* from the Coasts of Peru and Chili, collected by Capt. Albert H. Markham, R.N., with remarks on the geographical distribution of the group in the Pacific. P. Z. S. 1882, pp. 520–530, pl. xxxiv.

Interesting notes on geographical distribution of Gulls. *Xema furcatum*, ad. & juv. figured.

Larus canus breeding inland; R. Warren, Zool. 1882, pp. 241–243.

Larus sabinii in Norfolk; H. Stevenson, Zool. 1882, pp. 111–113.

Sternula placens, note on; E. L. Layard & L. C. Layard, Ibis, 1882, p. 476.

Sterna bergii. Skeleton (pl. ccxcv.), osteology (pl. ccxcvi.); A. Milne-Edwards & A. Grandidier, Ois. Madag.

Anous stolidus. Skeleton (pl. cclxxxix.), osteology (pl. ccxc.); *iid. tom. cit.*

Anous tenuirostris. Skeleton (pl. ccxc.*a*), osteology (pl. ccxc.*b*); *iid. tom. cit.*

Gygis alba. Osteology; *iid. tom. cit.* pl. ccxcii.

Gygis candida. Skeleton; *iid. tom. cit.* pl. ccxci.

TUBINARES.

Forbes, W. A. Zoology of the Voyage of H.M.S. 'Challenger.' Part xi. Report on the anatomy of the *Tubinares*. London: 1882, 4to, pp. 1–64, pls. i.–vii.

Aeipetes, g. n. Type, *Procellaria antarctica*; id. *tom. cit.* p. 59.

Cymochorea cryptoleucura, sp. n., Sandwich Islands, R. Ridgway, P. U. S. Nat. Mus. iv. pp. 337 & 338.

Daption capensis near Dublin; A. G. More, Ibis, 1882, p. 346.

Œstrelata jamaicensis. Note on its habits; D. Morris, Ibis, 1882, p. 183.

Puffinus chlororrhynchus. Skeleton (pl. ccxcvii.), osteology (pl. ccxcviii.); A. Milne-Edwards & A. Grandidier, Ois. Madag.

Puffinus obscurus in Norfolk; H. Stevenson, Tr. Norw. Soc. iii. pp. 467–473.

Procellaria albo-gularis. Eggs described; E. P. Ramsay, P. Linn. Soc. N. S. W. vii. p. 113.

Thalassidroma leachi and *T. pelagica* in Perthshire; H. M. Drummond Hay, Scot. Nat. vi. pp. 206–209.

Thalassidroma oceanica. Skeleton (pl. ccxcix.), osteology (pl. ccc.); A. Milne-Edwards & A. Grandidier, Ois. Madag.

Prion vittatus. Skeleton (pl. ccxciii.), osteology (pl. ccxciv.); *iid. tom. cit.*

HERODIONES.

Ardeidæ.

Ardea pacifica: its breeding habits; K. H. Bennett, P. Linn. Soc. N. S. W. vii. pp. 324–328. *A. wardi*, sp. n., Florida, R. Ridgway, Bull. Nutt. Orn. Club, vii. pp. 1–5.

Ardea ardesiaca. Adult figured; A. Milne-Edwards & Grandidier, Ois. Madag. pl. cclv.*a*.

Ardea comata. Osteology; *iid. tom. cit.* pl. ccxxvii.*c*.

Ardea bubulcus. Osteology; *iid. tom. cit.* pl. ccxxvii *b*.

Ardea idæ. Adult figured (pl. ccxxvi.), skeleton (pl. ccxxvii.), osteology (pl. ccxxvii.*a*); *iid. tom. cit.*

Ardea atricapilla var. *rutenbergi*. Adult figured; *iid. tom. cit.* pl. ccxxvii.*b*.

Ardea minuta var. *podiceps*. Adult figured (pl. ccxxix *a*), skeleton (pl. ccxxx.), osteology (pl. ccxxx.*a*); *iid. tom. cit.*

Nycticorax europæus. Skeleton (pl. ccxxviii.), osteology (pl. ccxxix.); *iid. tom. cit.*

Zonerodius, g. n. Type, *Z. heliosylus* (Less.); T. Salvadori, Ann. Mus. Genov. xviii. p. 336.

Scopidæ.

Scopus umbretta. Adult figured (pl. ccviii.), skeleton (pl. ccix.), osteology (pl. ccx.); Milne-Edwards & Grandidier, Ois. Madag.

Mesitidæ.

Mesites. The genus not Timeliine, but closely allied to *Rhinochetus* rather than to *Eurypyga*; W. A. Forbes, P. Z. S. 1882, pp. 267–270.

Mesites variegata. Adult figured (pls. ccxlvi. & ccxlvii.), skeleton (pl. ccxlviii.), osteology (pls. ccxlix. & ccxlix. *a*), pterylography (pl. ccl.), anatomy (pl. ccli.), details of structure (pl. ccxlvii. *a*); Milne-Edwards & Grandidier, Ois. Madag.

Ciconiidæ.

Anastomus madagascariensis. Adult figured (pl. ccxi.), skeleton (pl. ccxii.), osteology (pl. ccxiii.), details of structure (pls ccxiv. & ccxv.); *iid. tom. cit.*

Plataleiidæ.

Platalea flavipes. Its breeding habits; K. H. Bennett, P. Linn. Soc. N. S. W. vii. pp. 324–328.

Platalea telfairi. Adult figured (pl. ccxv.), skeleton (pl. ccxvi.), osteology (pl. ccxvii.); Milne-Edwards & Grandidier, Ois. Madag.

Ibis cristata. Adult figured (pl. ccxxiii.), skeleton (pl. ccxxiv.), osteology (pl. ccxxv.), details of structure (pl. ccxxii.); *iid. tom. cit.*

Ibis æthiopica, var. *bernieri.* Heads figured (pl. ccxviii.), adult (pl. ccxix.), skeleton (pl. ccxx.), osteology (pl. ccxxi.); *iid. tom. cit.*

Ibis falcinellus in Scotland; G. Sim, Scot. Nat. vi. p. 13.

Phœnicopteridæ.

Phœnicopterus minor. Adult figured (pl. cclxii.), osteology (pl. cclxiii.); Milne-Edwards & Grandidier, Ois. Madag.

STEGANOPODES.

Phaetontidæ.

Phaeton candidus. Skeleton (pl. cclxxix.), osteology (pl. cclxxx.); *iid. tom. cit.*

Phaeton rubricauda. Skeleton (pl. cclxxxi.), osteology (pl. ccxxxi. *a*); *iid. tom. cit.*

Pelecanidæ.

Graculus africanus. Skeleton (pl. cclxxxii.), osteology (pl. cclxxxiii.); *iid. tom. cit.*

Tachypetes minor. Skeleton (pl. cclxxxvi.), osteology (pls. cclxxxvii. & cclxxxviii.); *iid. tom. cit.*

Sula fiber in a mummified state from an island on the coast of Peru; J. E. Harting, P. Z. S. 1882, p. 311.

Plotidæ.

Plotus melanogaster. Skeleton (pl. cclxxxiv.), osteology (pl. cclxxxv.); Milne-Edwards & Grandidier, Ois. Madag.

ANSERES.

Stejneger, L. Outlines of a Monograph of the *Cygninæ*. P. U. S. Nat. Mus. v. pp. 174–221.

A valuable contribution, but involving a widespread change in the nomenclature of the Swans. *Palæocygnus*, g. n., type, *P. falconeri* (foss.), p. 180; *Sthenelus*, g. n., type, *S. melanocorypha* (Mol., = *C. nigricollis*, auct.); *Cygnus*, with three species, pp. 189–197; *Olor*, with four species, pp. 197–218; *Ctenopsis*, with one species, pp. 219 & 220.

Figures of the skulls of several genera of *Anseres* are given; E. Holub & Von Pelzeln, Beitr. Orn. Südafr. pp. 310–321.

Nettapus auritus. Adult figured (pl. cclxiv.), skeleton (pl. cclxv.), details of structure (pl. cclxxv., fig. 2); Milne-Edwards & Grandidier, *l. c.*

Anser brachyrrhynchus does not occur in Japan; H. Seebohm, Ibis, 1882, p. 369.

Dendrocygna viduata (? *arcuata*). Details of structure (pl. cclxxv. fig. 5); Milne-Edwards & Grandidier, Ois. Madag.

Dendrocygne arcuata var. *major*. Adult figured (pl. cclxxii.), skeleton (pl. cclxxiii.), osteology (pl. cclxxiv.), details of structure (pl. cclxxv. fig. 5); *iid. tom. cit.*

Sarcidiornis melanotis. Adult figured (pl. cclxvii.), skeleton (pl. cclxviii.), osteology (pls. cclxviii. *a* & cclxviii. *b*), details of structure (pl. cclxxv. fig. 1); *iid. tom. cit.*

Anas gibberifrons figured; P. L. Sclater, P. Z. S. 1882, pp. 452–454, pl. xxxiii.

Anas gibberifrons var. *bernieri*. Adult figured (pl. cclxx.), skeleton (pl. cclxxi.), osteology (pl. cclxxi. *a*), details of structure (pl. cclxxv. fig. 3); Milne-Edwards & Grandidier, Ois. Madag.

Anas melleri. Adult figured (pl. cclxix), details of structure (pl. cclxxv. *a*, fig. 1); *iid. tom. cit.*

Anas erythrorrhyncha. Details of structure; *iid. tom. cit.* pl. cclxxv. fig. 4.

Querquedula hottentotta. Details of structure; *iid. l. c.* pl. cclxxv. *a*, fig. 3.

Fuligula rufina in North America; R. Ridgway, P. U. S. Nat. Mus. iv. pp. 22–24.

Aythya nyroca. Details of structure; Milne-Edwards & Grandidier, Ois. Madag. pl. cclxxv. *a*, fig. 4.

Thalassornis leuconota. Details of structure; *iid. tom. cit.* pl. cclxxv. *a*, fig. 2.

Biziura lobata. Its anatomy; W. A. Forbes, P. Z. S. 1882, pp. 455–458.

PYGOPODES.

Podicipedidæ.

Podiceps pelzelni. Adult figured (pl. cclxxvi.), skeleton (pl. cclxxvii.) osteology (pl. cclxxviii.); A. Milne-Edwards & A. Grandidier, Ois. Madag.

ALCIDÆ.

DYBOWSKI, B. Observations sur les oiseaux de la famille des Mormonidés. Bull. Soc. Z. Fr. vii. pp. 290–300.

The author's travels in Kamtchatka, and the Komandarski Islands have given him unusually good opportunities for studying Puffins, of which he recognizes eight species, belonging to six genera. His notes on the colour of the face, always an important feature in these birds, are most valuable, as are also his illustrations.

Alca impennis. Remains on Island of Orousay, Argyllshire: bones figured; S. Grieve, J. L. S. xvi. pp. 479–487.

IMPENNES.

FILHOL, H. Observations relatives aux caractères ostéologiques de certaines espèces d'*Eudyptes* et de *Spheniscus*. Bull. Soc. Philom. (7) vi. pp. 226–235.

——. Sur la constitution du diaphragme des *Eudyptes*. Id. *tom. cit.* pp. 235–238.

——. Observations relatives au tronc cœliaque et à l'artère mésentérique supérieure de l'*Eudyptes antipodes*. Id. *tom. cit.* pp. 238–242.

——. Observations relatives à la circulation artérielle dans l'aile de quelques espèces de Manchots. *Id. tom. cit.* p. 242.

——. Observations relatives à la circulation artérielle dans le membre inférieur de quelques espèces de Manchots (*Aptenodytes pennanti*, *Eudyptes antipodes* et *E. chrysocoma*). Id. *tom. cit.* pp. 243–248.

CRYPTURI.

Crypturus balstoni, sp. n., Eastern Peru, E. Bartlett, P. Z. S. 1882, p. 374.

Sub-Class RATITÆ.

HUXLEY, T. H. On the Respiratory Organs of *Apteryx*. P. Z. S. 1881, pp. 560–569.

The author concludes that there is a fundamental resemblance between the respiratory organs of Birds and those of Reptiles, whilst the respective organs of Mammals are quite different.

SALVADORI, T. Monografia del gen. *Casuarius*, Briss. Mem. Acc. Tor. (2) xxxiv. pp. 173–217, pls. i. & ii.

Ten species recognized, with woodcuts of characters of wattles, and coloured figures of the heads.

Struthio camelus. A new Entozoon (*Strongylus douglassi*) described from its proventriculus; T. S. Cobbold, J. L. S. xvi. pp. 184–188, pl. iv.

REPTILIA AND BATRACHIA.

BY

G. A. BOULENGER.

GENERAL.

R. BAUME, "Odontologische Forschungen" (Leipzig: 1882), discusses the origin of the teeth of Vertebrates (pp. 17–40), and of Batrachians and Reptiles, pp. 53–61.

MASON, J. J. Minute Structure of the Central Nervous System of certain Reptiles and Batrachians of America. Illustrated by permanent photo-micrographs. Newport: 1879–82, 4to, 24 pp., cxiii. pls.

The object of this beautiful work is to illustrate, by photography, the structure of the central nervous system. No one animal is made a special object of research; but anatomical facts, taken from the different types, are brought together in order to facilitate comparison. The presentation of some of the most striking points of difference and resemblance, with a brief notice of the appearances and structures discovered by the author, form the greater part of the text. The types studied belong to 19 species, illustrating the *Crocodilia*, *Chelonia*, *Lacertilia*, *Ophidia*, and *Batrachia Ecaudata* and *Caudata*.

NUSSBAUM, M. Ueber den Bau und die Thätigkeit der Drüsen. IV. Mittheilung. Arch. mikr. Anat. xxi. pp. 296–351, pls. xv.–xviii.

Der Vorderdarm der Reptilien, pp. 317–323; Der Vorderdarm der Amphibien, pp. 323 & 324.

RAWITZ, B. Ueber den Bau der Spinalganglien. II. Die Gliederung des Organes und vergleichende Anatomie desselben. Arch. mikr. Anat. xxi. pp. 244–290, pls. xi.–xiv.

Batrachia, pp. 265 & 266; *Reptilia*, pp. 267–269.

REICHEL, P. Beitrag zur Morphologie der Mundhöhlendrüsen der Wirbelthiere. Morph. JB. viii. pp. 1–72, pl. i.

Pp. 9–22 treat of the *Batrachia*, pp. 22–51 of the *Reptilia*.

RETZIUS, G. Ueber ein Blutgefässe führendes Epithelgewebe im [illegible] branösen Gehörorgan. Biolog. Unters. ii. pp. 97–102.

SOLGER, B. Beiträge zur Kenntniss der Niere und besonders der Nierenpigmente niederer Wirbelthiere. Abh. Ges. Halle, xv. pp. 405–444, pl. iv.

Pp. 421–428 treat of the *Batrachia* (*Rana*, *Pelobates*, *Salamandra*, *Molge*, *Proteus*); pp. 429–441 of the *Reptilia* (*Coluber*, *Tropidonotus*, *Pseudopus*, *Anguis*, *Alligator*, *Testudo*).

F. MÜLLER publishes two supplements to his Catalogue of the herpetological collection of the Bâle Museum (*cf.* Zool. Rec. xv. *Rept.* p. 2); Verh. Ges. Basel. vii. pp. 120–174.

C. LOHMEYER publishes a systematic list of the Reptiles and Batrachians in the collection of the Museum der Naturforschenden Gesellschaft in Emden. The species have been determined by J. G. Fischer. 66. JB. nat. Ges. Emden, 1881–82, App. pp. 1–19.

FAUNÆ.

EUROPE.

LEYDIG, F. Ueber Verbreitung der Thiere im Rhöngebirge und Mainthal, mit Hinblick auf Eifel und Rheinthal. Verh. Ver. Rheinl. xxxviii. pp. 43–183.

A list of the Reptiles and Batrachians, with remarks, is given, pp. 76–88; also additional remarks on pp. 165–176.

RÉGUIS, J. M. F. Essai sur l'histoire naturelle des Vertébrés de la Provence et des Départements circonvoisins. Vertébrés anallantoidiques (Poissons et Batraciens). Marseille: 1882, 8vo, 429 pp., figs.

The Batrachians, pp. 341–421. Purely compilation.

As an appendix to his "Faune des Vertébrés de la Suisse," iv. (pp. i.–vi.) V. FATIO has additional notes on a few Reptiles and Batrachians of Switzerland.

O. BÖTTGER gives two lists of Reptiles and Batrachians collected in Sicily by Herr C. Hirsch. Ber. senck. Ges. 1880–81, pp. 134–143, and 1881–82, pp. 256–262.

ASIA.

HUBRECHT, A. A. W. List of Reptiles and Amphibians brought from British India by Mr. F. Day. Notes Leyd. Mus. iv. pp. 138–144.

AFRICA.

J. V. BARBOZA DU BOCAGE writes on rare or new Reptiles and Batrachians from Angola, describing 1 new genus and 3 new species of Snakes. J. Sci. Lisb. viii. pp. 299–304.

W. PETERS reports on a collection of Reptiles made in Socotra by Dr. E. Riebeck. SB. nat. Fr. 1882, pp. 42–46. 2 new species of Lizards are described.

[redacted]AILLANT gives an account of the Reptiles and Batrachians collected by M. Revoil, in the Somali country. 3 species are described as new. Mission G. Revoil aux Pays Çomalis; Faune et Flore; Reptiles et Batraciens. Paris: 1882, 8vo, 25 pp. 3 pls.

PETERS, W. Naturwissenschaftliche Reise nach Mossambique. Zoologie. III. Amphibien. Berlin: 1882, 4to, 191 pp. 33 pls.

J. V. BARBOZA DU BOCAGE has notes on some Reptiles from Angoche, Mossambique, in the Lisbon Museum. J. Sci. Lisb. viii. pp. 286–290.

GÜNTHER, A. Ninth Contribution to the knowledge of the Fauna of Madagascar. Ann. N. H. (5) ix. pp. 262–266.

Contains descriptions of 5 new species of Reptiles collected in East Betsileo by the Rev. Deans Cowan.

BÖTTGER, O. Diagnoses Reptilium et Batrachiorum novorum insulæ Nossi-Bé Madagascariensis. Zool. Anz. v. pp. 478–480.

AMERICA.

COPE, E. D. On the Zoological Position of Texas. Bull. U. S. Nat. Mus. 1880, No. 17, pp. 1–51.

This important paper, hitherto unrecorded, contains numerous notes on the Herpetological Fauna of Texas, and the description of several new forms, which will be noticed below under their respective headings.

BOCOURT, F. Mission Scientifique au Mexique et dans l'Amérique Centrale; III^e^ partie, Études sur les Reptiles et les Batraciens. Paris: 1882, fo. 8^e^ livr. pp. 489–528, pls. xxvii.–xxx.

Contains the conclusion of the *Amphisbænidæ*, and the first 3 families of Snakes, viz., *Typhlopidæ*, *Stenostomatidæ*, and *Boidæ*.

BROCCHI, P. Mission Scientifique au Mexique et dans l'Amérique Centrale; III^e^ partie, 2^e^ sect., Études sur les Batraciens. Paris: 1882, fo. 2^e^ livr. pp. 57–96, pls. xi.–xv.; also pls. vi. & viii., omitted from the preceding fascicle.

Contains a part of the *Ecaudata*.

O. BÖTTGER has a list of known Reptiles and Batrachians from the province St. Paul, Brazil. Ber. senck. Ges. 1880–81, pp. 130–133.

BOULENGER, G. A. Account of the Reptiles and Batrachians collected by Mr. Edward Whymper in Ecuador, in 1879–80. Ann. N. H. (5) ix. pp. 457–468.

A list of 39 species, 4 being described as new.

AUSTRALIA.

WOODS, J. E. T. On the Natural History of New South Wales. An Essay. Sydney: 1882, 8vo, 50 pp.

Superficial notes on the herpetological Fauna, pp. 30–32.

PALÆONTOLOGY.

COPE, E. D. The Reptiles of the American Eocene. Am. Nat. xvi. pp. 979–993, woodcuts.

NEWTON, E. T. Notes on the *Vertebrata* of the Pre-Glacial Forest Bed Series of the East of England. Part VI. *Aves*, *Reptilia*, and *Amphibia*. Geol. Mag. (2) ix. pp. 7–9.

Notes on remains referred to *Tropidonotus natrix*, *Vipera berus*, *Rana temporaria*?, *Rana esculenta*?, and *Triton cristatus*.

SAUVAGE, H. E. Recherches sur les Reptiles trouvés dans le Gault de l'Est du Bassin de Paris. Mém. Soc. Géol. (3) ii. art. iv. pp. 1–41, pls. xxix.–xxxii. Abstract in C. R. xciv. pp. 1265 & 1266.

Descriptions of numerous remains referred to various groups of *Reptilia*, including a new species of *Megalosaurus*.

——. Synopsis des poissons et des reptiles des terrains jurassiques de Boulogne-sur-Mer. Bull. Soc. Géol. (3) viii. pp. 524–547, pls. xix.–xxi.

REPTILIA.

BRONN, H. G. Klassen und Ordnungen des Thierreichs. vi. Abth. iii. pp. 673–1008, pls. lxxiii.–ciii. *Reptilia*, by C. K. Hoffmann.

Anatomy of the *Crocodilia* and *Lacertilia*.

GADOW, H. Beiträge zur Myologie der hinteren Extremität der Reptilien. Morph. JB. vii. pp. 329–466, pls. xvii.–xxi.

HOFFMANN, C. K. Contribution à l'histoire du développement des Reptiles. Arch. Néerl. xvii. pp. 168–192, pls. iv. & v.

ORNITHOSAURIA.

O. C. MARSH, Am. J. Sci. (3) xxiii. pp. 251–256, pl. iii., has a paper on the wings of Pterodactyles. He describes a beautifully preserved specimen, *Rhamphorrhynchus phyllurus*, sp. n., from the lithographic slates near Eichstädt, Bavaria, and shows the wing-membranes to have been very similar to the patagium of modern bats, also that the distal extremity of the tail supported a vertical membrane kept in position by a series of cartilaginous spines, homologous with neural spines and chevron bones. This paper also affords great information on the bones of the wings and scapular arch. The fossil is figured, natural size, on pl. iii., and a restoration of the animal given, p. 256.

ZITTEL, K. A. Ueber Flugsaurier aus dem lithographischen Schiefer Bayern's. Palæontogr. xxix. pp. 47–80, pls. x.–xiii.

This important monograph contains descriptions and figures of the following forms:—

Rhamphorrhynchus gemmingi, Mey.; the completely preserved pata-

[illegible]51, pl. x.; skull, p. 58, pl. xii. fig. 1; hind part of body, p. 59, [illegible] fig. 2. *R. longicaudus*, Münst., complete skeleton with exception of the skull, p. 54, pl. xi.

Pterodactylus kochi, Wagl., p. 64, pl. xiii. fig. 1, *elegans*, Wagn., p. 73, pl. xiii. figs. ii. & iii. *brevirostris* (Sömmer), p. 78, pl. xii. fig. 3

The author also remarks, p. 63, on the genera *Rhamphorrhynchus* and *Pachyrrhamphus*, which, as well as *Dimorphodon*, *Dorygnathus*, and *Ornithochirus*, he is inclined to consider as subgenera of one genus, *Rhamphorrhynchus*.

H. E. Sauvage, Mém Soc. Géol. (3) ii. art. iv. p. 6, pl. xxx. fig. 7, describes and figures a cervical vertebra from the Greensand of the Gault at Louppy (Meuse), referred to *Pterodactylus sedgwicki*, Owen.

DINOSAURIA.

O. C. Marsh, Am. J. Sci. (3) xxiii. pp. 81–86, and Ann. N. H. (5) ix. pp. 79–84, proposes the following classification of the *Dinosauria*, which group is raised to the rank of sub-class:—

Ord. I. Sauropoda.
Fams. *Atlantosauridæ*, *Morosauridæ*.

Ord. II. Stegosauria.
Fams. *Stegosauridæ*, *Scelidosauridæ*.

Ord. III. Ornithopoda.
Fams. *Camptonotidæ*, *Iguanodontidæ*, *Hadrosauridæ*.

Ord. IV. Theropoda.
Fams. *Megalosauridæ*, *Zanclodontidæ*, *Amphisauridæ*, *Labrosauridæ*, *Cœluridæ*, *Compsognathidæ*. The two latter form two suborders, viz., *Cœluria* and *Compsognatha*.

Ord. V.? Hallopoda.
Fam. *Hallopodidæ*.

The latter order is referred with doubt to the *Dinosauria*.

H. E. Sauvage remarks on the Jurassic Dinosaurs. Bull. Soc. Géol. (3) viii. pp. 522–524.

Also on various Jurassic Dinosaur remains from Boulogne-sur-Mer. *L. c.* pp. 540–543.

L. Dollo inaugurates a series of notes on the Dinosaurs of Bernissart, Belgium. In a first paper, the author establishes the specific distinctness of two forms of *Iguanodon* occurring in the Wealden of Bernissart, viz., *I. mantelli*, Owen, and *I. bernissartensis*, Blgr., and gives comparative figures of the fore limb and pectoral arch, and the hind limb and pelvic arch in the two species. He expresses himself on the natural position of the genus *Iguanodon*, and proposes a new arrangement for the group *Ornithopoda*, showing also that the characters ascribed by Marsh (*suprà*) to his family *Iguanodontidæ*, were the result of misinterpretation and misinformation. The order *Ornithopoda* is divided by Dollo into 3 families, viz., *Iguanodontidæ*, *Hypsilophodontidæ*, and *Hadrosauridæ*. Bull. Mus. Belg. i. pp. 161–180, pl. ix.

In a second paper, the same author describes and figures the s… of *Iguanodon bernissartensis*, pointing out also the differences sho… *I. mantelli*. L. c. pp. 205–214, pl. xii.

Iguanodon seeleyi, sp. n., Hulke, J. G. Soc. xxxviii. p. 135, pl. iv., Isle of Wight.

Ornithopsis, Seeley. Seeley describes a coracoid from the Wealden of Brook, in the Isle of Wight, which is referred with doubt to this genus; J. G. Soc. xxxviii. p. 367, woodcuts.

Ornithopsis eucamerotus, Hulke. Note on the pubis and ischium; Hulke, *l. c.* p. 372, pl. xiv.

Thecospondylus, g. n., allied to *Ornithopsis*; Seeley, *l. c.* p. 457, pl. xix. (sacrum). *O. horneri*, sp. n., *id. ibid.*; Southborough, in the Hastings Sand.

Megalosaurus superbus, sp. n., Sauvage, C. R. xciv. p. 1266, and Mém. Soc. Géol. (3) ii. art. iv. p. 9, pls. xxix. & xxx. figs. 1–5, xxxi. figs. 1–3, and xxxii. figs. 1–4, Gault of North-Eastern France.

Hylæosaurus. A dermal scute referred to this genus, figured by Sauvage, Mém. Soc. Géol. (3) ii. art. iv. pl. xxx. fig. 6.

H. G. Seeley has a note on the distal extremity of a Dinosaurian femur from the Upper Portlandian, near Boulogne, probably indicating a new genus. Bull. Soc. Géol. (3) viii. pp. 520–522, fig.

H. Grabbe makes remarks on newly-discovered footprints of large Reptiles in Bückeburg. Verh. Ver. Rheinl. xxxviii. corr. pp. 161–164.

W. H. Twelvetrees describes and figures a supposed Dinosaurian tooth from the Upper Permian cupriferous sandstones of Kargalinsk, near Orenburg, Russia. Geol. Mag. (2) ix. p. 338, pl. viii. fig. 3.

THERIODONTIA.

W. H. Twelvetrees, Geol. Mag. (2) ix., describes and figures a canine of an unknown Theriodont, p. 337, pl. viii. fig. 1, and an incisor of *Deuterosaurus biarmicus*, Eichw., p. 338, fig. 2, both from the upper Permian cupriferous sandstones of Kargalinsk.

CHELONIA.

Martin, H. N., & Moale, W. A. Handbook of Vertebrate Dissection. Part I. How to dissect a Chelonian. New York: 1881, 12mo.

[Not seen by the Recorder.]

On Jurassic Chelonian remains from Boulogne-sur-Mer; Sauvage, Bull. Soc. Géol. (3) viii. p. 536.

Testudo elephantina, D. & B. The skull figured by Peters, Reise nach Mossambique, iii. pl. iii. fig. B.

Xerobates, Ag. F. W. True writes on the North American Land Tortoises; P. U. S. Nat. Mus. iv. pp. 434–449.

Hadrianus octonarius, Cope (foss.), carapace figured by Cope; Am. Nat. xvi. pp. 992 & 993.

...yda impressa, sp. n., Günther, P. Z. S. 1882, p. 343, woodcuts, ...m.

Clemmys caspica (Gmel.). Extensive remarks on this species, which is divided into 2 sub-species, viz., *orientalis* (the typical form), and *sigriz*, Bp. ; Bedriaga, Bull. Mosc. lvi. pp. 335–342, woodcuts.

Baena arenosa, Leidy (foss.), carapace figured by Cope, *l. c.* p. 990.

Chelys fimbriata (Schneid.). Notes on, and figure of, a specimen living in the Zoological Gardens of London; Günther, Tr. Z. S. xi. p. 215, pl. 42. Also remarks on the cervical vertebræ, which are figured.

Tropidemys morinica, sp. n. (foss.), Sauvage, *l. c.* p. 536, pl. xx. figs. 1–3.

Cycloderma frenatum, Ptrs. Described and figured by Peters, *l. c.* p. 14, pls. i.–iii. A.

Trionyx. R. Hoernes has remarks upon *Trionyx*-remains from the fresh-water deposits of Trifail, in Southern Styria; Verh. geol. Reichsanst. 1882, pp. 39 & 40.

Trionyx scutum-antiquum, Cope (foss.). Carapace figured by Cope, *l. c.* p. 988.

Notochelys, g. n. (foss.), distinguished from Chelone by the hyosternal and hyposternal bones having completely coalesced, as in *Trionyx* and *Chelys*; Owen, J. G. Soc. xxxviii. p. 178, woodcuts. *N. costata*, sp. n., *id. ibid.*, Flinders River, Queensland, bed unknown.

PLESIOSAURIA.

Kipijanoff, W. Studien über die fossilen Reptilien Russlands. II. Theil: Gattung *Plesiosaurus*, Conyb. Mém. Pétersb. (7) xxx. No. 6, 55 pp. 19 pls.

Of the following species descriptions are given:—*Plesiosaurus bernardi*, Owen, p. 5, pls. i. ii. & iii., figs. 1–3, & xv.; *P. neocomiensis*, Campiche, p. 10, pls. iii. fig. 4, iv., v. figs. 3, 4, vi. figs. 1–4, ix. fig. 3, xvi. & xix. figs. 1–3; *P. helmerseni*, sp. n., p. 17, pls. v. figs. 1–5, vi. fig. 5, vii. viii. figs. 1–3, ix. figs. 1–4, x.–xviii.; *P. planus*, Owen, p. 32, pls. viii. figs. 4, 5, & xix. figs. 4–7, all from the Sewer or Kursk Sandstone.

H. E. Sauvage has notes on various Jurassic remains from Boulogne-sur-Mer. Bull. Soc. Géol. (3) viii. pp. 543–545.

Pleiosaurus pachyomus, Ow., p. 24, *latispinus*, Ow., p. 25, and *planus*, Ow., p. 26; remarks on remains found in the Gault of N. E. France. Sauvage, Mém. Soc. Géol. (3) ii. art. iv.

Polycotylus, Cope. On a fragment of humerus from the Gault of N. E. France; Sauvage, *l. c.* p. 27.

Polytychodon interruptus, Ow.; teeth described and figured by Sauvage, *l. c.* p. 27, pl. xxx. figs. 9–11.

Neusticosaurus, g. n., for *Simosaurus pusillus*, Fraas; Seeley, J. G. Soc. xxxviii. p. 350. Two specimens of this highly interesting Reptile—a Plesiosaur rather terrestrial than marine, having affinities with the terrestrial *Nothosauria* and the marine *Plesiosauria*—are described and figured (pl. xiii.).

ICHTHYOSAURIA.

On Jurassic remains from Boulogne-sur-Mer; Sauvage, Bull. Soc. Géol. (3) viii. pp. 545 & 546.

Ichthyosaurus campylodon, Cart. Sauvage, Mém. Soc. Géol. (3) ii. art. iv. p. 21, pls. ii. fig. 12, and iv. figs. 6 & 7, describes and figures remains from the Gault of N. E. France.

CROCODILIA.

BENEDEN, E. VAN. Recherches sur l'oreille moyenne des Crocodiliens et ses communications multiples avec le pharynx. Arch. Biol. iii. pp. 497–560, pls. xx.–xxii.

PARKER, W. K. Abstract of a memoir on the skull of the *Crocodilia*. P. Z. S. 1882, pp. 97 & 98.

Crocodilus acer, Cope (foss.), p. 982, *affinis*, Marsh (foss.), p. 984, and *clavis*, Cope (foss.), p. 985; skulls figured by Cope, Am. Nat. xvi.

Alligator mississipiensis (Daud.). Observations by J. Chaffanjon, Ann. Soc. L. Lyon (n.s.) xxviii. pp. 83–93, pl.

H. E. SAUVAGE has notes on various Jurassic Crocodile remains from Boulogne-sur-Mer. Bull. Soc. Géol. (3) viii. pp. 538–540.

Sauvage describes and figures fragmentary remains referred to a Crodilian; from the Gault of Louppy, Meuse (France). Mém. Soc. Géol. (3) ii. art. iv. p. 20, pls. iii. figs. 4 & 5, and iv. fig. 5.

LACERTILIA.

A. GÜNTHER contributes the article "Lizard," in the 9th edition of the "Encyclopædia Britannica," vol. xiv. pp. 732–738, giving a concise account of the order *Lacertilia*. He also gives an outline of the classification of the group; the sub-orders are those recognized by the author in 1867 (*cf.* Zool. Rec. iv. p. 131), except that the *Amphisbænoidea* are no longer included; the families are those proposed by J. E. Gray, with slight modifications.

F. LATASTE has notes on the reproduction of the tail in Lizards; CR. Ass. Fr. x. pp. 662 & 663.

STRAHL, H. Beiträge zur Entwickelung von *Lacerta agilis*. Arch. Anat. Phys. 1882, pp. 242–278, pls. xiv. & xv.

CHAMÆLEONTIDÆ.

Chamæleon vulgaris, Laur. Remarks on its capture, reproduction, and habits in captivity; J. v. Fischer, Zool. Gart. xxiii. pp. 4–13, 39–48, & 70–82.

Chamæleon calcarifer, Ptrs., figured by Peters, Reise n. Mossambique, iii. pl. iv.A.

Geckonidæ.

Pachydactylus punctatus, Ptrs., described and figured by Peters, Reise n. Mossambique, iii. p. 26, pl. v. fig. 2.

Hemidactylus mabouia, Mor. (= *H. platycephalus*, Ptrs.) figured; *id. l. c.* pl. v. fig. 3.

Hemidactylus ateles, A. Dum., var. nn. *articulatus*, p. 297, figs. 20–25, *scutellatus*, p. 299, figs. 26–30, and *depressus*, p. 300, figs. 31–36, Caroline Islands; Fischer, Arch. f. Nat. xlviii. pl. xvii.

Phyllodactylus pictus, Ptrs., described and figured by Peters, *l. c.* p. 29, pl. v. fig. 1.

Diplodactylus riebecki, sp. n., Peters, SB. nat. Fr. 1882, p. 43, Socotra.

Sphærodactylus imbricatus, sp. n., Fischer, Abh. Ver. Brem. vii. p. 234, pl. xv. figs. 4–10, habitat unknown. [= *S. macrolepis*, Gthr.—Rec.]

Naultinus silvestris, Buller, 1880. Remarks by H. C. Field, N. Z. J. Sci. i. p. 177.

Heteropholis, g. n. Allied to *Naultinus*, Gray, but with large tubercles scattered among the granular dorsal scales; Fischer, *l. c.* p. 235. *H. rudis*, sp. n., *id. l. c.* p. 236, pl. xvi. figs. 1–5, New Zealand.

Gymnodactylus kotschii, Stdchr. Bedriaga makes extensive remarks on this species, and establishes two varieties, viz., *maculatus* and *concolor*; Bull. Mosc. lvi. pp. 54–65.

Gymnodactylus crucifer, Val., redescribed and figured by Vaillant; Mission G. Revoil aux Pays Çomalis, Rept. & Batr. p. 17, pl. iii. fig. 1.

Agamidæ.

Agama mossambica, Ptrs., p. 38, pl. vii. fig. 1, and *armata*, Ptrs., p. 42, pl. vii. fig. 2, described and figured by Peters, Reise n. Mossambique, iii.

Agama rueppelli, sp. n. (= *A. colonorum*, Rüpp., *nec* Daud.), Vaillant, Miss. Revoil aux Pays Çomalis, Rept. & Batr. p. 6, pl. i., Somali-land.

Uromastix capensis. On its habits in captivity; J. v. Fischer, Zool. Gart. xxiii. pp. 181–184.

Uromastix batilliferus, sp. n., Vaillant, *l. c.* p. 10, pl. ii., Somali-land.

Megalania prisca. Owen (foss.). Notice of portions of the skeleton of the trunk and limbs; Owen, P. R. Soc. xxxiv. p. 267.

Iguanidæ.

Anolis rivieri[*i*], sp. n., Thominot, Bull. Soc. Philom. (7) vi. p. 251, Panama.

Iguana tuberculata. On its habits in captivity; J. v. Fischer, Zool. Gart. xxiii. pp. 236–241.

Metopoceros cornutus, Wagl. Notes on, and figure of, a specimen living in the Zoological Gardens of London: an account of the skeleton also given; Günther, Tr. Z. S. xi. p. 218, pls. xliii. & xliv.

Ctenosaura. A synopsis of the (6) species by Bocourt; Le Nat. 1882, p. 47.

Ctenosaura interrupta, sp. n. (= *Ctenosaura acanthura*, Boc., *nec* Shaw), Dugès, Le Nat. 1882, p. 47, California.

Hoplurus sebæ, D. & B., fig. 1, and *cyclurus*, Merr., fig. 2, fig[illegible] Peters, Reise n. Mossambique, iii. pl. vi.

Chalarodon madagascariensis, Ptrs., described and figured; *id. l. c.* p. 34, pl. vi. fig. 3.

Phymatolepis (*Uta*) *irregularis*, sp. n., Fischer, Abh. Ver. Brem. vii. p. 232, pl. xvii. figs. 1–4, Mexico.

Uta elegans, sp. n., Yarrow, P. U. S. v. Nat. Mus. v. p. 442, La Paz, California.

Crotaphytus copii, sp. n., *id. l. c.* p. 441, La Paz, California.

Sceloporus rufidorsum, sp. n., *id. l. c.* p. 442, California.

Holbrookia, Bd. Cope, Bull. U. S. Nat. Mus. 1880, No. 17, pp. 15 & 16, gives a synopsis of the four Texan species of this genus, viz., *H. propinqua*, Gir., *maculata*, Gir. (of which *H. approximans*, Bd., is but a variety), *texana*, Trosch., and *lacerata*, sp. n., p. 16.

Tropidocephalus, g. n. (?) for *T. azureus*, sp. n. (?), F. Müller, Verh. Ges. Basel, vii. p. 161, pl., Uruguay. [No doubt identical with *Ptygoderus pectinatus* (D. & B.)—Rec.]

Phrynosoma douglassi pygmæa, subsp. n., Yarrow, *l. c.* p. 443, Oregon.

Mosasauridæ.

L. Dollo has notes on the remains of these Lizards in the Brussels Museum. He describes and figures the anterior part of the skull (pl. iv.), the pterygoids (pl. v. figs. 1 & 2), and the sclerotic ring (pl. v. figs. 3 & 4), of *Mosasaurus camperi*, Mey., and establishes the two following new genera. A catalogue of the bones of *Mosasauridæ* in the Brussels Museum is appended; Bull. Mus. Belg. i. pp. 55–80, pls. iv.–vi.

Pterycollasaurus, g. n. (foss.), distinguished from *Mosasaurus* by having the pterygoids coalesced along the median line, for *Mosasaurus maximiliani*, Goldf.; *id. l. c.* p. 61.

Plioplatecarpus, g. n. (foss.), characterized by the presence of a sacrum; *id. l. c.* p. 62. *P. marshi*, sp. n., *id. l. c.* p. 64, pl. vi. (pectoral arch, fore-limb, tooth), Eben, near Maestricht (Lower chalk).

Dacosaurus. A tooth from the greensand of Grandpré, France, described and figured by Sauvage, Mém. Soc. Géol. (3) ii. art. iv. p. 21, pl. xxx. fig. 11.

Varanidæ.

Monitor saurus (Laur.). A young specimen figured by Peters, Rei[illegible] n. Mossamb. iii. pl. iv. fig. 2.

Monitor albigularis (Daud.). Head figured; *id. l. c.* fig. 3.

Hydrosaurus varius (Shaw), described and figured by McCoy, Prodr. Zool. Vict., Dec. v. p. 7, pl. xli. [1880].

Helodermatidæ.

J. G. Fischer publishes notes on the anatomy of *Heloderma horridum*, Wiegm., describing the poisonous glands, which are very large, and

chiefly under the lower jaw and the hyoid apparatus; Verh. damb. v. pp. 2–16, pl. iii.

R. W. Shufeldt records a case in which he was himself bitten by *Heloderma suspectum*, Cope, and expresses the opinion that, "taking everything into consideration, we must believe the bite of *H. suspectum* to be a harmless one, beyond the ordinary symptoms that usually follow the bite of an irritated animal." Am. Nat. xvi. pp. 907 & 908.

Tejidæ.

Tejus rufescens, Gthr., figured from life by Günther, Tr. Z. S. xi. pl. xlv.

Lacertidæ.

Lacerta viridis, var. n. *fusca*, Bedriaga, Bull. Mosc. lvi. p. 76, Milo Isle.

Lacerta oxycephala, Fitz. Bedriaga, *l. c.* pp. 80–83, distinguishes 3 varieties, viz., *modesta* and *maculata*, both from Dalmatia and Greece, and *reticulata*, Greece, var. nn.

Lacerta taurica, Pall. The same author has extensive remarks on a Lizard from Greece referred to this species, and distinguishes 3 varieties, viz., *peloponesiaca*, Bibr, *rathkii* and *maculata*, var. nn.; *l. c.* pp. 83–95. [This species turns out to be distinct from *L. taurica*, and must be named *L. peloponesiaca.*]

Lacerta atlantica, sp. n., Peters & Doria, Ann. Mus. Genov. xviii. p. 433, woodcuts, Canary Islands.

Eremias revoili, sp. n., Vaillant, Mission G. Revoil aux pays Çomalis, Rept. & Batr., p. 20, pl. iii. fig. 2, Somali-land.

Eremias holubi, sp. n., Steindachner, SB. Ak. Wien, lxxxvi. p. 83, pl., Crocodile River, Transvaal.

Ichnotropis macrolepidota, Ptrs., p. 45, pl. viii. fig. 1, and *squamulosa*, Ptrs., p. 49, pl. viii. fig. 2, described and figured by Peters, Reise n. Mossambique, iii.

Zonuridæ.

Platysaurus torquatus, Ptrs., described and figured by Peters, Reise n. Mossambique, iii. p. 52, pl. ix. A.

Tracheloptychus madagascariensis, Ptrs., described and figured; *id. l. c.* p. 52, pl. viii. fig. 3.

Gerrhosaurus robustus, Ptrs., described and figured; *id. l. c.* p. 58, pl. ix.

Pseudopus apus, Pall. H. E. Sauvage publishes a paper on the hind limbs of this lizard; Ann. Sci. Nat. xiii., No. 6, 6 pp.

Opheosaurus ventralis (L.). On its osteology; R. W. Shufeldt, P. U. S. Nat. Mus. iv. pp. 392–400, woodcuts.

Scincidæ.

Euprepes (*Euprepis*) *margaritifer*, Ptrs., p. 64, pl. x. fig. 1 *striatus*, Ptrs., p. 67, *varius*, Ptrs., p. 68, *lacertiformis*, Ptrs., p. 70, pl. x. fig. 2,

depressus, Ptrs., p. 71, pl. x. fig. 4, *comorensis*, Ptrs., p. 72, pl. [illegible] and *elegans*, Ptrs., p. 73, pl. xi. fig. 1, described by Peters, Reise n. [illegible] sambique, iii.

Euprepes (*Euprepis*) *socotranus*, sp. n., Peters, SB. nat. Fr. 1882, p. 45, Socotra.

Euprepes maculilabris (?), from Akropong, described by F. Müller, Verh. Ges. Basel, vii. p. 159.

Macroscincus coctei (D. & B.) Notes on specimens living in the Jardin des Plantes; L. Vaillant, C. R. xciv. pp. 811 & 812.

Gongylus ocellatus (Forsk.). Bedriaga, Bull. Mosc. lvi. pp. 48–51, distinguishes the following varieties: *vulgaris*, var. n., Greece & Syria, *variegatus*, Schn., Sicily, *bedriagæ*, Boscá, Spain, and *viridanus*, Gravh., Canary Islands.

Gongylus ocellatus. On its breeding in captivity; J. v. Fischer, Zool. Gart. xxiii. pp. 241–243.

Gongylus macrocercus, Günther, Ann. N. H. (5) ix. p. 263, and *stumpffi*, Böttger, Zool. Anz. v. p. 497, spp. nn., Madagascar.

Eumeces sundevalli, Smith (= *E. afer*, Ptrs.), described and figured by Peters, Reise n. Mossambique, iii. p. 75, pl. xi. fig. 2.

Eumeces pachyurus, p. 19, Texas, *pluvialis* (= *E. anthracinus*, var., Cope, 1877), p. 19, Mobile, Alabama, and *epipleurotus*, p. 40, Northern Boundary of Texas and Nebraska, spp. nn., Cope, Bull. U. S. Nat. Mus. 1880, No. 17.

Eumeces pachyurus compared with *E. septentrionalis*, Bd.; *id. l. c.* p. 39.

Plestiodon quercyi, sp. n. (foss.), Filhol, Bull. Soc. Philom. (7) vi. p. 127, "Phosphates du Quercy."

Hinulia muelleri, sp. n., Fischer, Arch. f. Nat. xlviii. p. 295, pl. xvi. figs. 16–19, Nicol Bay, W. Australia.

Anguis fragilis, L., var. n. *græca*, Bedriaga, *l. c.* p. 43, Greece.

Dumerilia bayonii, Boc., 1866 (= *Scincodipus congicus*, Ptrs., 1875), redescribed by Bocage, J. Sci. Lisb. viii. p. 299.

Trachydosaurus asper. On its habits in captivity; J. v. Fischer, *l. c.* pp. 206–210.

Ablepharus wahlbergi, Smith, described and figured by Peters, *l. c.* p. 77, pl. xi. fig. 3.

J. G. Fischer, Arch. f. Nat. xlviii. p. 292, gives a synopsis of the genera of *Pygopodidæ*, describing the two following as new:—

Cryptodelma, g. n., p. 289, agreeing with *Pygopus* in the femoral pores, with *Delma* in the smooth scales. *C. nigriceps*, sp. n., p. 290, pl. xvi. figs. 5–9, Nicol Bay, W. Australia.

Pseudodelma, g. n., p. 286, distinguished from *Delma*, Gray, in [illegible] unequal number of rows of scales, the broad palatal groove, and [illegible] absence of supra-nasalia. *P. impar*, sp. n., p. 287, pl. xvi. figs. 1–4, Melbourne.

Rhodona officieri, McCoy, Prodr. Zool. Vict., Dec. vi. p. 7, pl. li [1881], Victoria, and *bipes*, Fischer, *l. c.* p. 292, pl. xvi. figs. 10–15, Nicol Bay, W. Australia: spp. nn.

Acontias plumbeus, Bianc. (= *A. niger*, Ptrs.), described and figured by Peters, *l. c.* p. 81, pl. xii.

Herpetosaura arenicola, Ptrs., described and figured; *id. l. c.* p. 79, pls. xi. fig. 4, and xiii.A, fig. 4.

Typhlosaurus aurantiacus, Ptrs., described and figured; *id. l. c.* p. 83, pl. xiii. fig. 1.

Amphisbænidæ.

Agamodon, g. n., agreeing with *Trogonophis*, Kaup, in the acrodont dentition, but differing in the shape of the head, the structure of the skull, the absence of a lateral groove, the shape of the scales, and the presence of præ-anal pores; Peters, SB. Ak. Berl. xxvi. p. 580. *A. anguliceps*, sp. n., *id. l. c.* pl. x., Barava, E. Africa.

Pachycalamus, Gthr. Peters, *l. c.* p. 583, having examined the dentition of this genus, states that it is acrodont, and consequently refers the genus to the *Trogonophides*.

Amphisbæna violacea, Ptrs., described and figured by Peters, Reise n. Mossambique, iii. p. 85, pl. xiii. fig. 2.

Amphisbæna alba, L. Skull figured by Bocourt, Miss. Sc. Mex., Rept. pl. xxix. fig. 2.

Amphisbæna fuliginosa, L., described; *id. l. c.* p. 489.

Rhineyra floridana, Cope, described and figured; *id. l. c.* p. 491, pl. xxix. fig. 1.

Monopeltis sphenorrhynchus, Ptrs., described and figured; Peters, *l. c.* p. 87, pl. xiii.A, figs. 1-3.

Incertæ sedis.

Cadurcosaurus, g. n. (foss.), distinguished from *Dracænosaurus*, Pomel, by the posterior or eighth tooth being much smaller than the seventh, for *C. sauvagii*, sp. n., Filhol, Bull. Soc. Philom. (7) vi. p. 127, "Phosphates du Quercy."

A fragment of jaw found at Bedeille, Ariège, and referred to a large Saurian, is described by Pouech, Bull. Soc. Géol. (3) x. pp. 79–86.

OPHIDIA.

Jan, G., & Sordelli, F. Iconographie générale des Ophidiens (*cf.* Zool. Rec. xiii. *Rept.* p. 12). The title pages, the index to the plates, and an alphabetical index have been issued, thus bringing the work to a conclusion.

[illegible]nchard, R. Nouvelles Recherches sur le Péritoine du Python de Séba. Bull. Soc. Z. Fr. 1882, pp. 237–246.

Rochebrune, A. T. Mémoire sur les vertèbres des Ophidiens. J. de l'Anat. Phys. xvii. pp. 185–229, pls. xiv. & xv.

[Omitted from the preceding Record.]

J. G. Fischer has notes on specimens of Snakes in the Dresden Museum. Arch. f. Nat. xlviii. pp. 281–286.

H. A. Brons has notes upon the habits of some Western North American Snakes. Am. Nat. xvi. pp. 564–567.

Hopley, Catherine C. Snakes: Curiosities and Wonders of Serpent Life. London: 1882, 8vo, 614 pp.

A purely popular book.

Stradling, A. The Desquamation and Digestion of Serpents from a new point of view. Zool. xl. pp. 50–55.

——. Snakes venomous and non-venomous. *Tom. cit.* pp. 140–145.

——. On the treatment of Snakes in captivity. *Tom. cit.* pp. 448–456.

On destruction of life in India by poisonous Snakes. J. Fayrer, Nature, xxviii. pp. 205–208.

Typhlopidæ.

Typhlops tettentis, Ptrs., p. 92, pl. xv. fig. 1, *mossambicus*, Ptrs., p. 93, pl. xv. fig. 2, *fornasinii*, Bianc., p. 94, pl. xv. fig. 3, *obtusus*, Ptrs., p. 95, *mucruso*, Ptrs., p. 95, pl. xiii. fig. 3, *varius*, Ptrs., p. 97, pl. xiv. fig. 2, and xiv. A, fig. 1, *riparius*, Ptrs., p. 98, pl. xiv. A, fig. 2, *dinga*, Ptrs., p. 98, pl. xiv. fig. 1, and xiv. A, fig. 3, and *schlegeli*, Bianc., p. 99, described and figured by Peters, Reise n. Mossambique, iii.

Typhlops lenzi, p. 478, and *euproctus*, p. 479, spp. nn., Böttger, Zool. Anz. v., Nossi Bé, Madagascar.

Typhlops perditus, Ptrs., p. 499, pls. xxix. fig. 3, and xxx. fig. 3, and *longissimus*, D. & B., p. 500, pl. xxix. fig. 1, described and figured by Bocourt, Miss. Sc. Mex. Rept.

Liotyphlops albirostris, Ptrs., described and figured; *id. l. c.* p. 501, pl. xxx. fig. 1.

Helminthophis frontalis, Ptrs., described and figured; *id. l. c.* p. 502, pl. xxx. fig. 2.

Stenostomatidæ.

Stenostoma longicaudum, Ptrs., p. 102, pl. xv. fig. 5, and *scutifrons*, Ptrs., p. 104, pls. xiv. A, fig. 4, and xv. fig. 4, described and figured by Peters, Reise n. Mossamb. iii.

Stenostoma albifrons, Wagl., p. 505, pl. xxix. fig. 10, and *dulce* (Bd. & Gir.), p. 506, pl. xxix. fig. 8, described and figured by Bocourt, Miss. Sc. Mex., Rept.

Siagonodon dugesi, Bocourt, described and figured; *id. l. c.* p. 507, pls. xxix. fig. 9, and xxx. fig. 4.

Boidæ.

Charina bottæ (Blainv.), described by Bocourt, Miss. Sc. Mex., Rept, p. 511.

Wenona plumbea, Bd. & Gir., described and partly figured; *id. l. c.* p. 512, pl. xxx. fig. 7.

Loxocemus bicolor, Cope, described and partly figured; *id. l. c.* p. 515, pl. xxx. fig. 5.

Boa imperator, Daud., described and partly figured; *id. l. c.* p. 519, pl. xxx. fig. 8.

Chilabothrus inornatus (Reinh.), described; *id. l. c.* p. 524.

Ungaliophis, g. n., for *U. continentalis*, sp. n. (= *Ungalia* sp. ?, Müller); F. Müller, Abh. Ges. Basel, vii. p. 142, Guatemala.

Python molurus (L.). Observations on the incubation of this snake, with special regard to the alleged increase of temperature during that process; W. A. Forbes, P. Z. S. 1881, pp. 960–967.

Aspidiotes ramsayi, sp. n., Macleay, P. Linn. Soc. N. S. W. vi. p. 813, Fort Bourke, Australia.

Palæophiidæ.

Palæophis littoralis, Cope (foss.), and *halidanus*, Cope (foss.): vertebræ figured by Cope, Am. Nat. xvi. p. 981.

Uropeltidæ.

On the presence of pterygoid and palatine teeth in some genera of Uropelts (*Melanophidium*, *Platyplectrurus*); Peters, S.B. nat. Fr. 1882, pp. 148–149.

Colubridæ.

Homalocranium sexfasciatum, sp. n., Fischer, Abh. Ver. Brem. vii. p. 225, pl. xiv. figs. 8–10, Costa Rica.

Geophis unicolor, sp. n., Fischer, *l. c.* p. 227, pl. v. figs. 1–3, Mexico.

Microsoma notatum, sp. n., Peters, SB. nat. Fr. 1882, p. 127, habitat unknown.

Prosymna jani (Bianc.), described by Peters, Reise n. Mossambique, iii. p. 106.

Homalosoma variegatum, Ptrs., described and figured: *id. l. c.* p. 107, pl. xvi. fig. 1.

Amblyodipsas microphthalma (Bianc.), described; *id. l. c.* p. 109.

Uriechis nigriceps, Ptrs., p. 111, pl. xviii. fig. 1, *capensis*, Smith, p. 112, and *lunulatus*, Ptrs., p. 113, pl. xviii. fig. 2, described and figured, *id. l. c.*

Simotes tæniatus, Gthr. (?) from Saigon, described by F. Müller, Verh. Ges. Basel, vii. p. 144.

Contia episcopa, Kenn., recharacterized by Cope, Bull. U. S. Nat. Mus. 1880, No. 17, p. 20, and divided into 3 subspecies, viz., *episcopa* and *torquata*, subspp. nn., and *isozona*, Cope, 1866.

Enicognathus, sp., from Uruguay, described by F. Müller, *l. c.* p. 144.

Liophis (*Lygophis*) *y-græcum*, sp. n., Peters, SB. nat. Fr. 1882, p. 129, St. Paul, Brazil.

Coronella olivacea, Ptrs., p. 114, pl. xvii. fig. 1, and *semiornata*, Ptrs., p. 116, pl. xvii. fig. 2, described and figured by Peters, Reise n. Mossambique, iii.

Coronella whymperi, sp. n., Boulenger, Ann. N. H. (5) ix. p. 46 (gen der cuts, Ecuador.

Ophibolus getulus niger, p. 438, Indiana, *eiseni*, p. 439, California, and *multicinctus*, p. 440, California, Yarrow, P. U. S. Nat. Mus. 1882: subspp. nn.

Macroprotodon maroccanus, sp. n., Peters, SB. nat. Fr. 1882, p. 27, Morocco.

Ophirhina, g. n. (*Coronellinæ*), for *O. anchietæ*, sp. n., Bocage, J. Sci. Lisb. viii. p. 300, Benguella.

Coluber bairdi, sp. n., Yarrow, in Copo, *l. c.* p. 41, W. Texas.

Ptyas infra-signatus, sp. n., Günther, Ann. N. H. (5) ix. p. 263, Madagascar.

Zamenis viridiflavus. E. F. Honnorat writes on the abundance of this Snake in the bathing establishment at Digne, on its pairing, and on its power of fascination; CR. Ass. Fr. x. pp. 702–706.

Dromicus sexlineatus, p. 264, and *macrocercus*, p. 265, Günther, *l. c.*, Madagascar: spp. nn.

Rhamphiophis rostratus, Ptrs., described and figured by Peters, Reise n. Mossambique, p. 124, pl. xix. fig. 1.

Tropidonotus natrix, var. n. *moreoticus*, Bedriaga, Bull. Mosc. lxi. p. 287.

Tropidonotus dorsalis, Gthr. (?), described by F. Müller, *l. c.* p. 147, from Manilla.

Eutænia cyrtopis ocellata, subsp. n., Cope, *l. c.* p. 22, Texas.

Herpeton tentaculatum, Lac. W. Peters remarks on a specimen entirely covered with algæ, thus affording a proof of this Snake's exclusively aquatic life. SB. nat. Fr. 1882, p. 74.

Psammophis condanarus, Merr. Remarks by Fischer, Abh. Ver. Brem. vii. p. 228.

Philothamnus. J. V. Barboza du Bocage, J. Sci. Lisb. ix. pp. 1–19, publishes a revision of the African species of this genus, the number of which is admitted to be twelve; a key to all the species, and descriptions of those known to the author from autoptical examination, are given; also woodcuts representing the heads of the principal forms. 3 species are described as new, viz., *P. angolensis*, p. 7, Angola, *thomensis*, p. 11 (also viii. p. 302), S. Thomé, and *smithi*, p. 12, Guinea & Angola.

Philothamnus punctatus, Ptrs., p. 129, pl. xix.A, fig. 1, and *neglectus*, Ptrs., p. 130, pl. xix.A, fig. 2, described and figured by Peters, *l. c.*

Philothamnus irregularis (Leach). Head figured by Fischer, *l. c.* pl. xiv. figs. 5–7.

Leptophis (*Ahætulla*) sp., from the Gold Coast, described by F. Müller, *l. c.* p. 149.

Thelotornis kirtlandi (Hallow.). Head figured by Peters, *l. c.* pl. xix. fig. 2.

Oxybelis æneus, Wagl. Remarks on specimens in captivity; J. v. Fischer, Zool. Gart. xxiii. pp. 331–336.

Tachymenis infra-lineatus, sp. n., Günther, *l. c.* p. 265, Madagascar.

Lycophidion semi-annulis, Ptrs., described and figured by Peters, *l. c.* p. 135, pl. xvi. fig. 2.

Opisthoplus, g. n., Peters, SB. Ak. Berl. 1882, p. 1148. An Opistho-

esenting the general characters of the *Leptognathi*, but distinguished from any other snake by having no other maxillary teeth but the posterior sulcate fang. *O. degener*, sp. n., *id. l. c.* p. 1149, fig., habitat unknown, probably America.

Elapidæ.

Diemenia ferox, sp. n., Macleay, P. Linn. Soc. N. S. W. vi. p. 812, Fort Bourke, Australia.

Vermicella annulata, Gray, described and figured by McCoy, Prodr. Zool. Vict., Dec. vi. p. 11, pl. lii. [1881].

Elapsoidea semi-annulata, sp. n., Bocage, J. Sci. Lisb. viii. p. 303, Benguela.

Cyrtophis scutatus, Sundev., described and figured by Peters, Reise n. Mossambique, iii. p. 139, pl. xx. figs. 1–6.

Naia ingens, sp. n., Van Hasselt, Versl. Ak. Amst. xvii. p. 140, Sumatra or Borneo.

Dinodipsas, g. n., resembling *Dipsas* in external characters, but with the dentition of *Atractaspis* and *Causus*; Peters, SB. Ak. Berl. 1882, p. 893. *D. angulifera*, sp. n., *id. l. c.* p. 894, pl. xv., Puerto Cabello, Venezuela.

Viperidæ.

Vipera euphratica, Mart., p. 315, and *ammodytes*, L., p. 322; extensive remarks by Bedriaga, Bull. Mosc. lvi.

Vipera superciliaris, Ptrs., described and figured by Peters, Reise n. Mossambique, iii. p. 144, pl. xxi.

Crotalus intermedius, sp. n., Fischer, Abh. Ver. Brem. vii. p. 230, pl. xiv. figs. 1–4, Mexico.

Bothrops (*Bothriechis*) *bernouillii*, F. Müll., = *B. bicolor*, Cope; F. Müller, Verh. Ges. Basel, vii. p. 155.

Trigonocephalus bilineatus (Gthr.), pl. xxvii. fig. 1, *piscivorus* (Lacép.), pl. xxvii. fig. 2, and *contortrix* (L.), pl. xxviii. figured by Bocourt, Miss. Sc. Mex., Rept.

BATRACHIA.

As an appendix to the 'Catalogue of Batrachia gradientia, &c.' (*infrà*, p. 25), pp. 105–118, the Recorder has published a summary of the geographical distribution of the *Batrachia*, remarking that the plan according to which these animals have been dispersed over the globe's surface, is much the same as that recognized by Günther for the freshwater fishes. The principal geographical divisions adopted for the latter, receive for the *Batrachia* a slight modification, viz., the union of the Southern with the Equatorial zone. The designations Cyprinoid and Acyprinoid Divisions are changed, for this class of animals, into *Firmisternia* and *Arcifera*.

Blaue, J. Über den Bau der Nasenschleimhaut bei Fischen und Amphibien. Zool. Anz. v. pp. 657–660.

Boas, J. E. V. Ueber den Conus arteriosus und die Arterienbo[gen] Amphibien. Morph. JB. vii. pp. 488–572, pls. xxiv.–xxvi.

——. Beiträge zur Angiologie der Amphibien. *Op. cit.* viii. pp. 169–187, pls. vi.–viii.

Bouillot, J. Sur l'épithélium sécréteur du rein des Batraciens. C. R. xcv. pp. 603 & 604.

Sabatier, A. De la Spermatogénèse chez les Plagiostomes et chez les Amphibiens. C. R. xciv. pp. 1097–1099.

ECAUDATA.

Boulenger, G. A. Catalogue of the Batrachia Salientia s. Ecaudata in the Collection of the British Museum. 2nd edition. London: 1882, 8vo, pp. xvi. & 503, 30 pls.

This work contains descriptions of, or reference to, all the species introduced into zoological literature. 800 species, more than two-thirds of which have been examined by the author, are considered properly established. The British Museum collection contains 522 species, represented by 4692 specimens; when the first edition of the work was published (in 1858), the two numbers amounted to 214 and 1691 respectively. The following classification, derived from that of Cope, but modified in many respects, is adopted :—

Suborder I.—Phaneroglossa.

Series A. *Firmisternia.*

4 families: *Ranidæ, Dendrobatidæ, Engystomatidæ, Dyscophidæ.*

Series B. *Arcifera.*

8 families: *Cystignathidæ, Dendrophryniscidæ, Bufonidæ, Hylidæ, Pelobatidæ, Discoglossidæ, Amphignathodontidæ, Hemiphractidæ.*

Suborder II.—Aglossa.

2 families: *Dactylethridæ, Pipidæ.*

Remarks on the above work have been made by W. Peters, SB. nat. Fr. 1882, pp. 60–62.

Born, G. Eine Doppelbildung bei *Rana fusca.* Zool. Anz. iv. pp. 135–139.

[Omitted from the preceding Record.]

Calmels, G. Evolution de l'épithélium des glandes à venin du Crapaud. C. R. xcv. pp. 1007–1009.

Dogiel, J. Die Nervenzellen und Nerven des Herzventrikels beim Frosche. Arch. mikr. Anat. xxi. pp. 21–25, pl. ii.

Duval, M. Développement de l'appareil génito-urinaire chez la Grenouille. Rev. Montp. (3) i. pp. 471–497, pls. ix. & x.

Ecker, A. Die Anatomie des Frosches. Ein Handbuch für Physiologen, Aertzte, und Studirende. Mit Beiträgen von R. Wiedersheim. Braunschweig: 1881–82, 8vo. Abth. i. ii.

Concludes the work. [First part published in 1864; *cf.* Zool. Rec. ii. p. 144.]

Giacosa, G. Études sur la composition chimique de l'œuf et de ses enveloppes chez la Grenouille commune. Arch. Ital. Biol. ii. pp. 226–231.

Hinckley, M. H. On some differences in the mouth-structure of tadpoles of the Anourous Batrachians found in Milton, Mass. P. Bost. Soc. xxi. pp. 307–314, pl. v.

Jourdain, S. Recherches sur le système lymphatique de la *Rana temporaria*. Rev. Montp. (3) i. pp. 152–168, pls. i.–iii.

Kastschenko, N. Ueber die Krappfärbung der Froschgewebe. Arch. mikr. Anat. xxi. pp. 357–386, pls. xix. & xx.

Kingsley, J. S. A case of polimely in the *Batrachia*. P. Bost. Soc. xxi. pp. 169–175, pl. ii.

[Omitted from the preceding Record.]

Kupffer, C. Ueber aktive Betheiligung des Dotters am Befruchtungsakte bei *Bufo variabilis* und *vulgaris*. SB. bayer. Ak. 1882, pp. 608–618.

Selenka, E. Der embryonale Excretionsapparat des kiemenlosen *Hylodes martinicensis*. SB. Ak. Berl. 1882, pp. 608–618.

Stirling, W. On the Nerves of the Frog's Lung. P. R. Soc. xxxiv. pp. 265 & 266.

Verhoeff, J. J. Histiologische en physiologische Bijdragen tot de kennis van den Bulbus Aortæ van het Kikvorschhart. Onderz. phys. Lab. Utrecht (3) vii. pp. 149–190, 1 pl.

Ranidæ.

Rana esculenta, L. Camerano has remarks on the variations of this Frog in the circum-Mediterranean district; he distinguishes the following varieties:—1. *viridis*, Rös., Northern and Central Europe (p. 685); 2. *lessonæ*, var. n., Italy (p. 686); 3. *cachinnans*, Pall., East Europe (p. 687); 4. *bedriagæ*, var. n., Damas (p. 688); 5. *latastii*, var. n., N.W. Africa, Portugal (p. 689). CR. Ass. Fr. x. pp. 680–690.

Rana oxyrrhyncha, Sundevall, p. 147, and *mossambica*, Ptrs., p. 149, pl. xxii. fig. 1, described by Peters, Reise n. Mossambique, iii.

Rana guttulata, Blgr., pl. ii. *verrucosa*, Gthr., pl. iv. fig. 1, and *inguinalis*, Gthr. (= *Limnodytes madagascariensis*, A. Dum.), pl. iii. fig. 3, figured by Boulenger, Cat. Batr. Ecaud.

Rana laticeps, p. 20, pl. i. fig. 1, W. India, *blanfordi*, p. 23, pl. i. fig. 2, Arabia, *modesta*, p. 25, pl. i. fig. 3, Celebes, *dobsoni*, p. 32, pl. iii. fig. 1, W. India, *guentheri*, p. 58, pl. iv. fig. 1, S. China, *betsileana*, p. 460, Madagascar, *curta*, p. 461, Madagascar, *semipalmata*, p. 56, pl. iv. fig. 3, Malabar, *phrynoderma*, p. 462, S. India, *elegans*, p. 59, pl. v. fig. 1, W. Africa, *kreffti*, p. 64, pl. iii. fig. 2, Solomon Islands, *femoralis*, p. 463, Madagascar, *cowani*, p. 463, Madagascar, *latipalmata*, p. 464, Tenasserim, *everetti*, p. 72, pl. vi. Philippines, *plicifera*, p. 464, Madagascar, *aspera*, p. 465, Madagascar, and *glandulosa*, p. 73, pl. vii. Borneo, Boulenger, *l. c.*: spp. nn.

Pyxicephalus edulis, Ptrs., p. 152, pl. xxiii. fig. 1, and *maxmoratus*, Ptrs., p. 155, pl. xxiii. fig. 2, described and figured by Peters, *l. c.*

Limnodytes bravanus, sp. n., Peters, SB. nat. Fr. 1882, p. 9, Brava, E. Africa.

Rhacophorus jerdoni (Gthr.), pl. viii. fig. 1, *appendiculatus* (Gthr.), pl. viii. fig. 4, *schlegeli* (Gthr.), pl. ix. fig. 1, and *maximus*, Gthr., pl. ix. fig. 3, figured by Boulenger, *l. c.*

Rhacophorus rhodoscelis, p. 466, Madagascar, *femoralis*, p. 466, Madagascar, *pulcher*, p. 467, Madagascar, *depressiceps*, p. 467, Madagascar, *fergusoni*, p. 82, pl. viii. fig. 3, Ceylon, *luteus*, p. 468, Madagascar, *microglossus*, p. 87, pl. ix. fig. 2, habitat unknown, and *beddomii*, p. 468, Malabar, Boulenger, *l. c.*: spp. nn.

Rhacophorus brachychir, sp. n., Böttger, Zool. Anz. v. p. 480, Nossi Bé, Madagascar.

Chiromantis xerampelina, Ptrs., described and figured by Peters, Reise n. Mossambique, iii. p. 170, pl. xxiv. fig. 1.

Chiromantis petersi, sp. n., Boulenger, *l. c.* p. 93, pl. x. fig. 1, interior of E. Africa.

Ixalus hypomelas, Gthr., fig. 4, *oxyrrhynchus*, Gthr., fig. 5, *nasutus*, Gthr., fig. 6, and *beddomii*, Gthr., fig. 7, figured by Boulenger, *l. c.* pl. x.

Ixalus fuscus, p. 96, pl. x. fig. 3, S. India, *silvaticus*, p. 469, Malabar, *pulcher*, p. 469, Malabar, *flaviventris*, p. 105, pl. xi. fig. 1, Malabar, and *signatus*, p. 106, pl. xi. fig. 2, India, Boulenger, *l. c.*: spp. nn.

Cornufer meyeri (Gthr.) figured, *id. l. c.* pl. xi. fig. 4.

Cornufer guentheri, sp. n., *id. l. c.* p. 108, pl. xi. fig. 3, Philippines.

Nyctibatrachus, g. n., distinguished from *Rana* and *Rhacophorus* in the pupil being erect. For *Rana pygmæa*, Gthr. (figured, pl. xii. fig. 1); *id. l. c.* p. 113.

Nyctibatrachus major, sp. n., *id. l. c.* p. 114, pl. xii. fig. 2, Malabar.

Nyctibatrachus sinensis, sp. n., Peters, SB. nat. Fr. 1882, p. 146, Mount Lofau, Province of Canton.

Nannobatrachus, g. n., closely allied to the preceding, but the toes free. For *N. beddomii*, sp. n., Boulenger, *l. c.* p. 470, Malabar.

Nannophrys ceylonensis, Gthr., figured; *id. l. c.* pl. xii. fig. 3.

Nannophrys guentheri, sp. n., *id. l. c.* p. 115, pl. xii. fig. 4, Ceylon.

Arthroleptis macrodactylus, p. 117, pl. xi. fig. 5, Gaboon, and *boettgeri*, p. 118, pl. xi. fig. 6, Caffraria, *id. l. c.*: spp. nn.

Rappia. Hyperolius granulosus, Ptrs., p. 161, pl. xxii. fig. 3, *flavoviridis*, Ptrs., p. 163, pl. xxii. figs. 4 & 5, *argus*, Ptrs., p. 164, pl. xxii. fig. 6, *marginatus*, Ptrs., p. 165, pl. xxii. fig. 8, *taeniatus*, Ptrs., p. 166, pl. xxii. fig. 7, and *salinæ* (Bianc.), p. 169, described and figured by Peters, Reise n. Mossambique, iii.

Hyperolius variegatus, p. 8, Mozambique, *vermicularis*, p. 8, Malange, Angola, and *striolatus*, p. 9, Taita, E. Africa, Peters, SB. nat. Fr. 1882: spp. nn.

Megalixalus fornasinii (Bianc.), described and figured by Peters, Reise n. Mossambique, iii. p. 160, pl. xxiv. fig. 2.

Nyctixalus, g. n., distinguished from *Megalixalus* by having the toes

nearly [illegible]e. For *M. margaritifer*, sp. n., Boulenger, Ann. N. H. (5) x. p. 35, East Indies.

Cassina argyreivittis, Ptrs., described and figured by Peters, *l. c.* p. 157, pl. xxii. fig. 2.

Cassina wealii, sp. n., Boulenger, Cat. Batr. Ecaud. p. 131, pl. xi. fig. 7, Caffraria.

Hylambates viridis, Gthr., figured; *id. l. c.* pl. xii. fig. 5.

Prostherapis whymperi, sp. n., Boulenger, *l. c.* p. 139, and Ann. N. H. (5) ix. p. 462, fig., Ecuador.

Dendrobatidæ.

Mantella, g. n., for *Dendrobates madagascariensis* and allies; Boulenger, Cat. Batr. Ecaud. p. 141.

Mantella cowani, sp. n., *id. l. c.* p. 471, Madagascar.

Dendrobates tinctorius (Schn.), described and figured by Brocchi, Miss Sc. Mex., Batr. p. 89, pl. xi. fig. 2.

Dendrobates parvulus, sp. n., Boulenger, *l. c.* p. 145, pl. xii. fig. 6, Ecuador.

Engystomatidæ.

Phryniscus varius (Stann.), described and figured by Brocchi, Miss. Sc. Mex., Batr. p. 96, pl. xi. fig. 1.

Phryniscus proboscideus, p. 150, pl. xiii. fig. 1, Bahia, *pulcher*, p. 154, pl. xiii. fig. 2, E. Peru, and *elegans*, p. 155, Ecuador, spp. nn., Boulenger, Cat. Batr. Ecaud., the latter species figured in Ann. N. H. (5) ix. p. 464.

Calophrynus madagascariensis, sp. n., *id. l. c.* p. 472, Madagascar.

Scaphiophryne, g. n., distinguished from *Callula* in the presence of precoracoids; for *S. marmorata*, sp. n., *id. l. c.* p. 472, Madagascar.

Scaphiophryne spinosa, sp. n. (= *S. marmorata*), Steindachner, SB. Ak. Wien, lxxxv. p. 189, pl. ii., Madagascar.

Engystoma elegans, sp. n., Boulenger, *l. c.* p. 162, Mexico.

Callula obscura, Gthr., fig. 3, and *triangularis*, Gthr., fig. 4, figured, *id. l. c.* pl. xiii.

Breviceps mossambicus, Ptrs., described and figured by Peters, Reise n. Mossambique, iii. p. 176, pl. xxv. fig. 2.

Breviceps adspersus, sp. n., *id. l. c.* p. 177, Damara-land.

Hemisus marmoratus, Ptrs., described and figured, *id. l. c.* p. 173, pl. xxv. fig. 1.

Hemisus taitanus, sp. n., *id. l. c.* p. 175, Taita, E. Africa.

Dyscophidæ.

This family is established by Boulenger, Cat. Batr. Ecaud. pp. 179 & 473, for the genera *Dyscophus*, Grand., *Calluella*, Stoliczka, *Cophyla*, Böttger, and the two following:—

Platypelis, g. n., for *P. cowani*, sp. n., *id. l. c.* p. 474, Madagascar.

Plethodontohyla, g. n., for *Callula notosticta*, Gthr., *id. l. c.* p. 473.

Plethodontohyla inguinalis, p. 473, and *brevipes*, p. 474, *id. l. c.*, Madagascar: spp. nn.

Dyscophus guineti, Grand. (= *D. antongilii*, Grand., Blgr., nec *D. insularis*, Grand.), described and figured by Steindachner, SB. Ak. Wien, lxxxv. p. 191, pl. iii.; the same species also described by F. Müller, Abh. Ges. Basel, vii. p. 136, under the name of *D. insularis*.

Cystignathidæ.

Pseudis minuta, Gthr., figured by Boulenger, Cat. Batr. Ecaud. pl. xiv. fig. 1.

Hylodes conspicillatus, Gthr., fig. 2, and *unistrigatus*, Gthr., figured, *id. l. c.* pl. xiv.

Hylodes surdus, p. 212, pl. xiv. fig. 3, *buckleyi*, p. 217, pl. xiv. fig. 5, *curtipes*, p. 218, pl. xiv. fig. 6, and *whymperi*, p. 218, spp. nn., *id. l. c.* Ecuador; the latter species figured in Ann. N. H. (5) ix. p. 465.

Hylodes brocchii, sp. n., Boulenger, in Brocchi, Miss. Sc. Mex., Batr., p. 60, pl. xv. fig. 3, Guatemala.

Lithodytes latrans, Cope, described by Cope, Bull. U. S. Nat. Mus. 1880, No. 17, p. 25.

Syrrhopus marnocki, sp. n., *id. l. c.* p. 26, Texas.

Hylonomus, g. n., distinguished from *Hylodes* by having the toes extensively webbed; Peters, SB nat. Fr. 1882, p. 107. This name being preoccupied, is subsequently (p. 127) changed into *Hyloscirtus*.

Hyloscirtus bogotensis, sp. n., *id. l. c.* p. 108, Bogota.

Cauphias guatemalensis, Brocchi, p. 62, pl. xii. fig. 3, and *crassus*, Brocchi, p. 64, pl. xii. fig. 4, described and figured by Brocchi, Miss. Sc. Mex., Batr.

Ceratophrys appendiculata, Gthr., fig. 1, and *fryi*, Gthr., fig. 2, figured by Boulenger, *l. c.* pl. xv.

Ceratophrys ornata (Bell). Remarks on the habits, and figure of a specimen living in the Zoological Garden of London; Günther, Tr. Z. S. xi. p. 222, pl. xlvi.

Ceratophrys americanus (D. & B.), figured by Brocchi, *l. c.* pl. vi. figs. 3 & 4.

Ceratophrys cultripes (R. & L.), described by F. Müller, Abh. Ges. Basel, vii. p. 134. The author proposes to refer the genus *Odontophrynus*, which was established for this species by Reinhardt & Lütken, to the family "*Bombinatoridæ*," and more specially to the neighbourhood of *Pelobates*.

Ceratophrys stolzmanni, sp. n., Steindachner, SB. Ak. Wien, lxxxv. p. 190, pl. i. Tumbez.

Edalorrhina buckleyi, sp. n., Boulenger, *l. c.* p. 228, pl. xvi. fig. 6, Ecuador.

Paludicola. F. Müller, *l. c.* p. 132, describes, without giving it a name, a species of this genus, which he suspects to be new, and probably also the type of a new genus. [Should be compared with *Eupemphix nattereri*, Stdchr.—Rec.]

Nattereria lateristriga, Stdchr., = *Phryniscus olfersi*, Mart., and is to be referred to *Paludicola*; Peters, SB. nat. Fr. 1882, p. 62.

Leptodactylus mystacinus (Burm.), described by F. Müller, *l. c.* p. 130.

...actylus albilabris (Gthr.), figured by Boulenger, *l. c.* pl. xvi. fig. 4. *...dactylus longirostris*, sp. n., Boulenger, *l. c.* p. 240, pl. xvi. fig. 3, ... Brazil.

Borborocœtes calcaratus (Gthr.), fig. 1, and *coppingeri* (Gthr.), fig. 2, figured, *id. l. c.* pl. xvii.

Limnomedusa macroglossa (D. & B.), described by F. Müller, *l. c.* p. 131.

Limnodynastes tasmaniensis, Gthr., p. 11, pl. xlii. fig. 1, and *dorsalis* (Gray), p. 12, pl. xlii. fig. 2, described and figured by McCoy, Prodr. Zool. Vict., Dec. v. [1880].

Limnodynastes platycephalus, Gthr., figured by Boulenger, *l. c.* pl. xvii. fig. 3.

Chiroleptes platycephalus, Gthr., pl. xvii. fig. 4, *brevipalmatus*, Gthr., pl. xvii. fig. 5, and *albo-guttatus*, Gthr., pl. xviii. fig. 1, figured, *id. l. c.*

Bufonidæ.

Engystomops pustulosus (Cope), described and figured by Brocchi, Miss. Sc. Mex., Batr., p. 86, pl. viii. fig. 1.

Pseudophryne guentheri, sp. n., Boulenger, Cat. Batr. Ecaud. p. 279, pl. xviii. fig. 2, Australia.

Nectophryne guentheri, sp. n., *id. l. c.* p. 280, pl. xviii. fig. 3, Borneo

Bufo viridis, Laur. Camerano writes on the variations of this species in the Circum-Mediterranean district, distinguishing 4 subvarieties. Bull. Ass. Fr. x. pp. 690–692.

Bufo punctatus, Bd. & Gir., p. 68, pl. vii. fig. 2, *levifrons*, Brocchi (= *compactilis*, Wiegm.), p. 70, pl. vi. fig. 2, *canaliferus*, Cope, p. 74, pl. viii. fig. 2, *bocourti*, Brocchi, p. 84, pl. vii. fig. 1, *mexicanus*, Brocchi, p. 85, pl. viii. fig. 3, described and figured by Brocchi, *l. c.*

Bufo arenarum, Hensel, described by F. Müller, Abh. Ges. Basel, vii. p. 138, as *Bufo* sp. ?.

Bufo leptopus, Gthr., pl. xviii. fig. 4, *beddomii*, Gthr., pl. xix. fig. 1, *cæruleo-stictus*, Gthr., pl. xxi. fig. 1, figured by Boulenger, *l. c.*

Bufo funereus, Bocage, redescribed by Bocage, J. Sci. Lisb. viii. p. 303; the same species described and figured as *B. benguelensis*, sp. n., by Boulenger, *l. c.* p. 299, pl. xix. fig. 3; the error corrected, p. 475.

Bufo buchneri, sp. n., Peters, SB. nat. Fr. 1882, p. 147, Lunda, W. Africa.

Bufo latastii, p. 294, pl. xix. fig. 2, Ladak, *blanfordi*, p. 301, pl. xix. fig. 4, Abyssinia, *himalayanus* (= *B. melanostictus*, var. *himalayanus*, Gthr.), p. 305, pl. xx., Himalayas, *micro-tympanum*, p. 307, pl. xxii. fig. 1, Malabar, *parietalis*, p. 312, pl. xxi. fig. 2, Malabar, and *ceratophrys*, p. 319, pl. xxii. fig. 2, Ecuador, Boulenger, *l. c.*: spp. nn.

Bufo beblingi, sp. n., Yarrow, P. U. S. Nat. Mus. v. p. 441, La Paz, California [= *B. punctatus*, B. & G.—Rec.].

Notaden bennetti, Gthr., figured by Boulenger, *l. c.* pl. xxii. fig. 3.

Hylidæ.

Chorophilus copii, p. 334, Georgia, and *septentrionalis*, p. 335, pl. xxiii. fig. 1, Great Bear Lake, Boulenger, Cat. Batr. Ecaud.: spp. nn. The

former species described by Cope, Bull. U. S. Nat. Mus. 1880, p. 27, as *C. ocularis* (Daud.).

Acris crepitans, Bd. Notes on the habits of this frog by C. C. Abbott; Am. Nat. xvi. pp. 707-711.

Hyla versicolor, Leconte. Mary H. Hinckley has interesting notes on the eggs and tadpoles of this frog; P. Bost. Soc. xxi. pp. 104–107, pl. iii. [Omitted from the preceding Record.]

Hyla venulosa, Laur. Recorded from Mexico, and remarks on the life-coloration, and habits; Boulenger, Ann. N. H. (5) x. p. 327.

Hyla infra-frenata, Gthr., fig. 1, and *affinis* (Gray), fig. 3, figured by Boulenger, Cat. Batr. Ecaud. pl. xxvi.

Hyla aurea (Less.), described and figured by McCoy, Prodr. Zool. Vict., Dec. vi. p. 13, pl. liii. [1881]. The larva also figured. [The spiraculum is represented on the right side, probably by inadvertence of the artist.—Rec.]

Hyla plicata, Brocchi, pl. xii. fig. 1, *pansosana*, Brocchi, pl. xii. fig. 2, *regilla*, Bd. & Gir., pl. xiii. fig. 2, *eximia*, Bd., pl. xiii. figs. 3 & 4, *pænulata*, Brocchi, pl. xiv. fig. 1, *lichenosa*, Gthr., pl. xiv. fig. 2, *staufferi*, Cope, pl. xiv. fig. 3, *baudini*, D. & B., pl. xiv. fig. 4, and *versicolor*, Harl., pl. xv. fig. 1, figured by Brocchi, Miss. Sc. Mex., Batr.

Hyla appendiculata, p. 349, pl. xxiii. fig. 2, Brazil and Ecuador, *infra-maculata*, p. 354, pl. xxiii. fig. 3, Amazons, *tuberculosa*, p. 355, pl. xxiv. fig. 1, Ecuador, *albo-guttata*, p. 356, pl. xxiii. fig. 4, Ecuador, *granosa*, p. 358, pl. xxiv. figs. 2 & 3, S. America, *buckleyi*, p. 362, pl. xxv. fig. 1, Ecuador, *quadrangulum*, p. 367, pl. xxv. fig. 2, Ecuador, *salvini*, p. 372, Costa Rica, *albo-punctulata*, p. 385, pl. xxiv. fig. 4, Ecuador, *parviceps*, p. 293, pl. xxv. fig. 3, Ecuador, and *depressiceps*, p. 402, pl. xxv. fig. 4, Ecuador, Boulenger, Cat. Batr. Ecaud.: spp. nn.

Nototrema plumbeum, p. 417, pl. xxviii. fig. 1, and *longipes*, p. 418, pl. xxvii. *id. l. c.*, Ecuador: spp. nn.

Hylella. The name *Hylomantis*, Peters (1880), being preoccupied (Peters, 1872), is changed into *Drymomantis*; Peters, SB. nat. Fr. 1882, p. 8.

Hylella buckleyi, sp. n., Boulenger, *l. c.* p. 420, pl. xxv. fig. 5, Ecuador.

Exerodonta (= *Hylella*) *sumichrasti*, Brocchi, figured by Brocchi, *l. c.* pl. xv. fig. 2.

Pternohyla, g. n., distinguished from *Hyla* in having the inner metatarsal tubercle compressed, shovel-shaped; Boulenger, Ann. N. H. (5) x. p. 326. *P. fodiens*, sp. n., *id. ibid.*, Presidio, W. Mexico.

Nyctimantis, g. n., distinguished from *Hyla* by the vertical pupil; Boulenger, Cat. Batr. Ecaud. p. 421. *N. rugiceps*, sp. n., *id. l. c.* p. 422, pl. xxviii. fig. 2, Ecuador.

Agalychnis moreleti (A. Dum.), figured by Brocchi, *l. c.* pl. xiii. fig. 1.

Phyllomedusa hypochondrialis (Daud.); figured from life, and remarks by Boulenger, P. Z. S. 1882, pp. 264 & 265, pl. xiii.

Phyllomedusa dacnicolor, Cope. Notes on the life-coloration, and habits; Boulenger, Ann. N. H. (5) x. p. 328.

Phyllomedusa buckleyi, p. 425, pl. xxix. fig. 1, Ecuador, *lemur*, p. 425, Costa Rica, *vaillanti*, p. 427, pl. xxix. fig. 2, Brazil, *burmeisteri*, p. 428,

...sauvagii, p. 429, pl. xxix. fig. 3, Buenos Ayres, Boulenger, Cat. ... Ecaud.: spp. nn.

Triprion spatulatus, sp. n., Günther, Ann. N. H. (5) x. p. 279, Presidio, W. Mexico.

Pelobatidæ.

Batrachopsis, g. n., for *Asterrophrys melanopyga*, Doria; Boulenger, Cat. Batr. Ecaud. p. 439. This name being pre-occupied, is changed into *Lechriodus*; id. Cat. Batr. Caud. & Apoda, p. 116.

Discoglossidæ.

Alytes obstetricans (Laur.). A. Brunk reports on larvæ of this species which passed more than two years and a half without transforming; Zool. Anz. v. pp. 92–94.

Amphignathodontidæ.

A new family established by the Recorder, Cat. Batr. Ecaud. p. 450, for *Amphignathodon guentheri*, g. & sp. nn., p. 451, pl. xxx., from Ecuador, presenting the characters of the *Hylidæ*, with the addition of true teeth in the lower jaw.

Dactylethridæ.

Xenopus muelleri, Ptrs., described and figured by Peters, Reise n. Mossambique, iii. p. 180, pl. xxv. fig. 3.

CAUDATA.

Boulenger, G. A. Catalogue of the Batrachia Gradientia s. Caudata and Batrachia Apoda in the Collection of the British Museum. 2nd Edition. London: 1882, 8vo, pp. viii. & 127, 9 pls.

This work, carried on the same plan as the Catalogue of Tailless Batrachians (*suprà*, p. 18), contains descriptions of 101 species of the Order *Caudata*, four-fifths of which are known to the author from autoptical examination; the collection of the British Museum, which contained only 38 species in 1850 (date of the 1st edition of the Catalogue), contains now 78 species, represented by 1021 specimens. This ...der is divided into 4 families, viz., *Salamandridæ*, *Amphiumidæ*, ...teidæ, and *Sirenidæ*; the *Salamandridæ* are again subdivided into 4 ...bfamilies, viz., *Salamandrinæ*, *Amblystomatidæ*, *Plethodontinæ*, and *Desmognathinæ*.

Iwakawa, J. The Genesis of the Egg in *Triton*. Q. J. Micr. Sci. xxx. pp. 260–277, pls. xxii.–xxiv. Also abstract in Zool. Anz. v. pp. 10–12.

The author's researches have been made in Japan, on *Molge pyrrhogastra*, Boie, an account of which is given in the introduction to the paper.

PARKER, W. K. On the Morphology of the Skull in the *A*
Urodela. Tr. Linn. Soc. (2), ii. pp. 165–212, pls. xiv.–xxi.

The author describes and figures the skulls of 8 species of *Salamandridæ*, generally in both the adult and the larval states. [The skull described and figured as that of an adult *Onychodactylus* (? species), belongs to the larva of *Onychodactylus japonicus*.—REC.]

——. On the Structure and Development of the Skull in the Urodeles. Tr. Z. S. xi. pp. 171–214, pls. xxxvi.–xli.

In this part, the author treats of the skulls of *Megalobatrachus*, *Cryptobranchus*, and *Siren*, and compares them with those of the British Newts.

L. CAMERANO describes a case of polymely in *Molge vulgaris*; Atti Soc. Ital. xxv. pp. 113–116, woodcuts.

Molge, Merrem. This name is substituted for *Triton*, Laur., preoccupied; Boulenger, *l. c.* p. 6.

J. v. Bedriaga has notes on copulation in the following species:—*Molge montana* (Savi), pp. 265 & 266, *aspera* (Dugès), pp. 266–268, and *hagenmuelleri* (Lataste), pp. 357–359; Zool. Anz. v.

Molge montana (Savi). The same writer points out the absence of a bony fronto-squamosal arch, and the peculiar structure of the tongue in this species, and proposes to maintain the genus *Megapterna*, Savi; *l. c.* pp. 45 & 46.

Diemyctylus miniatus meridionalis, subsp. n., Cope, Bull. U. S. Nat. Mus. 1880, No. 17, p. 30, Matamoros, Mexico, and Texas.

Pachytriton brevipes (Sauvg.), figured by Boulenger, *l. c.* pl. i.

Hynobius peropus, sp. n., *id. l. c.* p. 33, pl. ii. fig. 1, China or Japan.

Batrachyperus sinensis (Sauvg.), figured, *id. l. c.* pl. iii. fig. 1.

Amblystoma tigrinum. Note on the habits and rearing of the Axolotl, by Carbonnier, P. U. S. Nat. Mus. v. pp. 221 & 222.

J. W. Spengel makes remarks on the Axolotl, with special reference to Velasco's paper [*cf.* Zool. Rec. xvi. *Rept.* p. 18]. The question is no longer under what circumstances transformation takes place, but what circumstances prevent the transformation of the Axolotl into *Amblystoma*; Biol. Centralbl. ii. pp. 80–83.

Amblystoma krausii, sp. n., Peters, SB. nat. Fr. 1882, p. 145, Flathead River, U.S. [= *A. macrodactylum*, Bd.—REC.]

Spelerpes yucatanus, id. *l. c.* p. 137, and *yucatanicus*, Boulenger, *l. c.* p. 72, Yucatan, spp. nn. [These 2 species are identical; Pet
description appears to have a few days priority over the
corder's.]

Cryptobranchus alleghaniensis. Notes on the habits of the Menopome, by C. H. Townsend, Am. Nat. xvi. p. 139; remarks upon the vitality of the same animal, by W. Frear, *tom. cit.* p. 325.

Proteus anguinus. Notes on the reproduction of this Batrachian in captivity; Marie v. Chauvin, Zool. Anz. v. pp. 330–332. An anatomical study of its eye, by Desfosses, C. R. xciv. pp. 1729–1731.

APODA.

BOULENGER, G. A. Catalogue of the Batrachia Gradientia, &c. (*cf. suprà*, p. 25).

Contains diagnoses of 32 species, 19 of which are represented in the British Museum. The classification proposed by Peters in 1879 is adopted.

Ichthyophis monochrous (Blkr.); a large larva figured by Boulenger, *l. c.* pl. iv. fig. 1.

Uraeotyphlus africanus, sp. n., *id. l. c.* p. 92, pl. v. fig. 1, W. Africa.

Cæcilia isthmica, Cope, fig. 1, and *pachynema*, Gthr., fig. 2, figured, *id. ibid.* pl. vi.

Hypogeophis guentheri, sp. n., *id. l. c.* p. 96, pl. vii. fig. 1, Zanzibar. [The first species of the Order *Apoda* discovered in E. Africa.]

Dermophis albiceps, sp. n., *id. l. c.* p. 98, pl. viii. fig. 1, Ecuador.

Gegenophis carnosus (Bedd.), figured; *id. l. c.* pl. viii. fig. 3.

Gymnopis, sp. —?, from Guatemala, described by F. Müller, Verh. Ges. Basel, vii. p. 128.

Chthonerpeton petersi, sp. n., Boulenger, *l. c.* p. 104, pl. ix. fig. 2, Upper Amazon.

STEGOCEPHALA.

DAWSON, J. W. On the Results of Recent Explorations of Erect Trees containing Animal Remains in the Coal Formation of Nova Scotia. Phil. Tr clxxiii. pp. 621–646, pls. xxxix.–xlvii.

The Vertebrate animals in the twenty-four trees (*Sigillariæ*) extracted belong to the Order *Stegocephala*, and represent 12 species, of which 2 are of a doubtful character, owing to the imperfection of their remains. The *Labyrinthodonta* are represented by the genus *Dendrerpeton* with 2 species; the other forms are referable to the *Microsauria*, and fall into 5 genera, viz.:—*Hylonomus*, Dawson (4 species), *Smilerpeton*, Dawson (1 sp.), *Hylerpeton*, Owen (2 sp.). *Fritschia*, Dawson (1 sp.), and *Amblyodon*, Dawson (1 sp.). References follow:—

Hylonomus lyelli, Dawson, p. 635, pls. xxxix. figs. 1–14, & xlv. fig. 140; *H. wymani*, Dawson, p. 637, pl. xxxix. figs. 15–17; *H. multidens*, p. 637, pl. xxxix. figs. 23–26, and *latidens*, p. 637, pl. xxxix. figs. 18–22: spp. nn.

Smilerpeton, g. n., distinguished from *Hylonomus* by the form of the mandibular and maxillary teeth, which are wedge-shaped, with cutting edges. For *Hylonomus aciedentatus*, Dawson, p. 638, pl. xl. figs. 28–45.

Hylerpeton dawsoni, Owen, p. 639, pl. xli. figs. 52–85; *H. longidentatum*, sp. n., p. 640, pl. xlii. figs. 86–109.

Fritschia, g. n., differing from *Hylerpeton* in the absence of palatal teeth, and in the abdominal armour, which consists of long slender rods instead of scales. *F. curtidentata*, sp. n., p. 641, pl. xliii. figs. 110–128.

Dendrerpeton acadianum, Owen, p. 642, pls. xl. figs. 46–51, and xliv. figs. 129–137, and *oweni*, Dawson, p. 643, pl. xliv. figs. 131, 138 & 139.

Sparodus, sp. ?, p. 643, pl. xl. figs. 52–56.

Amblyodon, g. n., for *A. problematicum*, sp. n., provisionally [illegible] scanty materials, p. 644, pl. xl. figs. 57–61.

Dawson, J. W. On Horny Scales and other Appendages of Carboniferous Amphibians. *L. c.* pp. 647 & 648, woodcut (*Hylonomus* and *Dendrerpeton*).

——. On the Footprints of Batrachians observed in the Carboniferous Rocks of Nova Scotia. *L. c.* pp. 651–654.

The evidence of these footprints serves to indicate that both *Labyrinthodonta* and *Microsauria* existed in Nova Scotia throughout the Carboniferous Period, and that very many of the larger and important species still remain to be discovered.

Credner, E. Die Stegocephalen aus dem Rothliegenden des Plauen'schen Grundes bei Dresden. III. Thiel. Z. geol. Ges. xxiv. pp. 213–237, pls. xii. & xiii. [Also preliminary note in SB. Ges. Leipzig, viii. pp. 45 & 46.]

The following forms are described:—*Pelosaurus*, g. n., allied to *Melanerpeton* and *Archegosaurus*, p. 214; *P. laticeps*, sp. n., p. 215, pls. xii. & xiii. figs. 1–5.

Archegosaurus decheni, Goldf., p. 231, pl. xiii. figs. 9–14, and *latirostris*, Jord., p. 235, pl. xiii. figs. 6–8.

Geinitz, H. B., & Deichmüller, J. V. Die Saurier der unteren Dryas von Sachsen. Palæontogr. (3) v. i. pp. 1–46, pls. i.–ix.

Extensive descriptions and figures of the following forms are given:—
Saurichnites, sp., p. 9, pl. x., footprints.
Phanerosaurus pugnax, sp. n., p. 10, pls. iv. & v.
Zygosaurus labyrinthicus (Gein.), p. 16, pls. ii. & iii.
Archegosaurus latifrons, sp. n., p. 21, pl. vi.
Melanerpeton latirostre, Credn., p. 23, pl. vii. figs. 1–5, and *spiniceps*, p. 27, pl. vii. figs. 6–11.
Branchiosaurus amblystomus, Credn., p. 31, pl. vii. figs. 12–15, and *petrolei* (Gaudry), p. 34, pl. viii. figs. 10–19.
Hyloplesion fritschi, sp. n., p. 38, pl. viii. figs. 1–9.

The same authors, pp. 41 & 42, also give a synopsis of the characters of the pectoral arch and the pectoral plates of the Saxon *Stegocephala*. Also a note on *Palæosiren beinerti*, Gein., p. 42, pls. ix. & viii. figs. 22.

E. D. Cope, Am. Nat. xvi. pp. 334 & 335, states that the Order *Ganocephala*, Owen, must be given up, as founded on erroneous characters, and proposes the new name *Rachitomi* for the suborder represented by *Eryops*, *Actinodon*, &c.; he establishes 2 families, viz., *Trimerorachidæ* (g. *Trimerorachis*) and *Eryopidæ* (gg. *Eryops*, *Actinodon*, and probably *Zatrachys*).

On the discovery of remains of *Ophiderpeton*, or a closely-allied genus, in the Wardie shales, Carboniferous sandstone, near Edinburgh; J. Stock, Nature, xxviii. p. 22.

PISCES.

BY

G. A. Boulenger.

(Assisted by W. R. Ogilvie-Grant.)

PHYSIOLOGICAL, ANATOMICAL, AND GENERAL.

Balfour, F. M. On the Nature of the Organ in Adult Teleosteans and Ganoids, which is usually regarded as the Head-kidney or Pronephros. Q. J. Micr. Sci. xxx. pp. 12–16. [Also Rep. Brit. Ass. li. p. 721.]

Balfour's investigations show that the pronephros, which is found in the larvæ or embryos of almost all *Ichthyopsida*, except the *Elasmobranchii*, is a purely larval organ, and never constitutes an active part of the excretory system in the adult state.

A. Baume, Odontologische Forschungen (Leipzig : 1882), discusses the origin of the teeth of Vertebrates (pp. 17–40) ; the teeth of the Fishes are especially dealt with, pp. 41–52.

Berger, E. Beiträge zur Anatomie des Sehorganes der Fische. Morph. JB. viii. pp. 97–168, pls. iv. & v.

Blaue, J. Über den Bau der Nasenschleimhaut bei Fischen und Amphibien. Zool. Anz. v. pp. 657–660.

Cattie, J. T. Recherches sur la glande pinéale (Epiphysis cerebri) des Plagiostomes, des Ganoïdes et des Téléostéens. Arch. Biol. iii. pp. 101–196, pls. iv.–vi.

Day, F. On the Food of Sea Fishes. Zool. xl. p. 235.

Emery, C. Sur la structure des fibres musculaires striées de quelques Vertébrés. Arch. Ital. Biol. ii. pp. 133 & 134.

Krukenberg, C. F. W. Die Pigmente der Fischhaut. Vergl. physiol. Stud. Adria, ii. pp. 55–58, pl. iii., and pp. 138–143, pl. ix.

R. Leuckart has a paper on Hybridism in Fishes. Arch. f. Nat. (2) xlviii. pp. 309–315.

A. H. Malm describes A. W. Malm's method of preservation of spirit specimens. Göteb. Mus. Arsskr. iii. 1881 [1882] pp. 13–20.

Nussbaum, M. Ueber den Bau und die Thätigkeit der Drüsen. iv. Mittheilung. Arch. Mikr. Anat. xxi. pp. 296–351, pls. xv.–xviii.

On the fish stomach : pp. 323–327.

Parker, T. J. On a new Method of preserving Cartilaginous Skeletons and other Soft Animal Structures. Tr. N. Z. Inst. xiv. pp. 258–264.

Rautenfeld, E. von. Morphologische Untersuchungen über das Skelet der hinteren Gliedmassen von Ganoiden und Teleostien. Inaug.-Dissert. Dorpat: 1882, 8vo, 47 pp. 2 pls.

[Not seen by the Recorder.]

Rawitz, B. Ueber den Bau der Spinalganglien. II. Die Gliederung des Organes und vergleichende Anatomie deselben. Arch. Mikr. Anat. xxi. pp. 244–290, pls. xi–xiv. Fishes, pp. 253–265.

Reichel, P. Beitrag zur Morphologie der Mundhöhlendrüsen der Wirbelthiere. Morph. JB. viii. pp. 1–72, pl. i.

Fishes, pp. 7 & 8.

Ryder, J. A. Development of the Silver Gar (*Belone longirostris*), with observations on the genesis of the blood in embryo Fishes, and a comparison of Fish Ova with those of other Vertebrates. Bull. U. S. Fish Comm. i. pp. 283–301, pls. xix.–xxi.

Solger, B. Beiträge zur Kenntniss der Niere und besonders der Nierenpigmente niederer Wirbelthiere. Abh. Ges. Halle, xv. pp. 405–444, pl. iv.

Pp. 412–420 treat of the Fishes.

Swain, J. A review of Swainson's Genera of Fishes. P. Ac. Philad. 1882, pp. 272–284.

——. An identification of the species of Fishes described in Shaw's General Zoology. *L. c.* pp. 303–309.

Trois, E. F. Riccherche sul Sistema Linfatico dei Gadoidei. Atti Inst. Venet. viii. (5) 5 pp. [Recorded from a separate copy.]

The species examined are *Motella tricirrata* and *M. maculata*, and the following facts have been observed :—

1. An annular sinus which surrounds the eye.
2. The co-existence of two subvertebral lymphatic trunks which traverse the canal formed by the hæmapophysis.
3. The existence of a longitudinal dorsal subjacent trunk, and of a corresponding post-anal one, which is found in both *Motella tricirrata* and *M. maculata*.

FAUNÆ.

Europe.

Tizard, T. H., & Murray, J. Exploration of the Færöe Channel during the Summer of 1880 in H.M.S. 'Knight Errant.' P. R. Soc. Edinb. xi. Fishes by A. Günther, pp. 677–680.

10 species are recorded, 6 of which are new to the British fauna; 1 species is described as new.

Schiödte, J. C. Zoologia Danica. Afbildninger af Danske Dyr med populær text. Kjöbenhavn,-4to. Fishes by G. Winther.

Three fascicles of this publication, which has hitherto been omitted from the Record, have been issued:—Fasc. i. (pp. 1–18, pls. i.–iii.) in 1878; Fasc. ii. (pp. 19–26, pl. iv.), in 1881; Fasc. iii. (pp. 27–34, pl. v.) in 1882.

Day, F. The Fishes of Great Britain and Ireland.

Pts. iv. & v. were issued in 1882. Pt. iv. (pp. 241–336, pls. lxix.–xcii.) concludes the first volume, and treats of the *Gasterosteidæ* (conclusion), *Centriscidæ*, *Labridæ*, *Gadidæ*, *Ophidiidæ*, and *Macruridæ*. Pt. v. (pp. 1–96, pls. xciv.–cxiv.) contains the *Pleuronectidæ*, *Sternoptychidæ*, and a part of the *Salmonidæ*.

F. Day has notes on new or rare Fishes for the British Coast. Zool. xxxix. pp. 338, 385 & 424. [Omitted from the preceding Record.]

Cornish, T. Rare Fishes on the Cornish Coast. Zool. xl. pp. 192 & 193.

The species recorded are:—*Trachinus vipera*, *Gadus collarius*, and *Cyclopterus lumpus*.

——. Spinous Shark at Penzance. *L. c.* pp. 22 & 23.

Leydig, F. Ueber Verbreitung der Thiere im Rhöngebirge und Mainthal, mit Hinblick auf Eifel und Rheinthal. Verh. Ver. Rheinl. xxxviii. pp. 43–183.

The Fishes are enumerated on pp. 88–91.

Fatio, V. Faune des Vertébrés de la Suisse. Vol. iv. Histoire Naturelle des Poissons. 1ère Partie. Genève et Bale: 1882, 8vo, 786 pp. 5 pls.

This important volume contains extremely detailed and careful descriptions of the species of Acanthopterygians and Cyprinoids known to occur in Switzerland, and also more concise accounts of the species occurring at no great distance from the boundaries of that country. Of the 5 plates, two are coloured, and will be referred to below; the others are devoted to structural details.

Réguis, J. M. F. Essai sur l'Histoire Naturelle des Vertébrés de la Provence et des Départments circonvoisins. Vertébrés anallantoïdiques (Poissons et Batraciens.) Marseille: 1882, 8vo, 429 pp. figs. Fishes, pp. 35–340.

Asia.

Sauvage, H. E. Catalogue des Poissons recueillis par M. E. Chantre pendant son voyage en Syrie, Haute-Mésopotamie, Kurdistan et Caucase. Bull. Soc. Philom. (7) vi. pp. 163–168.

A list of 32 species, 7 being described as new.

Károli, János. Prodromus piscium Asiæ orientalis a Domino Joanne Xantus annis 1868–70 collectorum. Term. füzetek, v. pp. 147–187.

A systematic list of 625 species, 5 being described as new.

Africa.

A. R. Pereira Guimarães gives a supplement to the list of Fishes from Madeira, the Azores, and the African Portuguese possessions, in the Lisbon Museum. J. Sci. Lisb. viii. pp. 60–39.

Rochebrune, A. T. de. Faune de la Sénégambie. Poissons. Act. Soc. L. Bord. vi. pp. 37–180, pls. i.–vi.

The species hitherto recorded from Senegambia, 336 in number, are enumerated, and the synonymy given. Of the new species, figures are given and the descriptions, published by the author in 1880, and by Vaillant in 1879, reproduced. When known, the indigenous name is appended.

Steindachner, F. Beiträge zur Kenntniss der Fische Afrika's. 1. Beitrag zur Kenntniss der Fische Senegambiens. Denk. Ak. Wien, xliv. pp. 19–54, 9 pls.

Contains descriptions of, or remarks upon, 58 species, 6 of which are given as new. [These have already been referred to, with the exception of 1, in the preceding Record, from the Abstract in Anz. Ak. Wien, 1881].

H. E. Sauvage has a paper on a collection of Fishes made by M. Chaper in the Assinie territory, Ivory Coast. 13 species are enumerated, 4 being described as new. Bull. Soc. Z. Fr. 1882, pp. 313–325, pl. v. fig. 1.

America.

Lockington, W. N. Sketch of the progress of North American Ichthyology in the years 1880–81. Am. Nat. xvi. pp. 765–772.

Bean, T. H. Notes on a Collection of Fishes made by Captain Henry E. Nichols, U. S. N., in British Columbia and Southern Alaska, with descriptions of [two] new species and a new genus (*Delolepis*). P. U. S. Nat. Mus. iv. pp. 463–474.

Swain, J. A review of the *Syngnathinæ* of the United States, with a description of one new species. P. U. S. Nat. Mus. v. pp. 307–315.

[Swain, J.] A review of the species of *Stolephorus* found on the Atlantic Coast of the United States. Bull. U. S. Fish Comm. 1882, pp. 55–57.

3 species are recognized and redescribed.

Goode, G. B., & Bean, T. H. Reports on the Results of Dredging under the Supervision of Alexander Agassiz, on the East Coast of the United States, during the Summer of 1880, by the U. S. Coast Survey Steamer, 'Blake,' Commander J. R. Bartlett, U. S. N., Commanding. Report on the Fishes. Bull. Mus. C. Z. x. pp. 183–226.

The specimens discussed in this preliminary report were obtained off the Eastern coast of the United States between George's Bank, and a line eastward from the vicinity of Charleston, S. Carolina, between N. lat. 31° 57′ to 41° 35′, and W. long. 65° 35′ to 78° 18′, at depths varying from 44–1632 fath. 52 species are treated of [for the Selachians, *cf.* Garman, *infrà*, p. 8]; 17 species and 7 genera are described as new.

Hay, O. P. On a collection of Fishes from the Lower Mississippi Valley. Bull. U. S. Fish Comm. 1882, pp. 57–75.

64 species are enumerated with notes; 5 species and 1 genus are described as new. When known, the indigenous name is appended. A table showing the geographical distribution is also added.

Jordan, D. S., & Gilbert, C. H. Notes on Fishes observed about Pensacola, Florida, and Galveston, Texas, with description of new species. P. U. S. Nat. Mus. v. pp. 241–301.

G. B. Goode, & T. H. Bean give descriptions of 25 new species of Fish from the Southern United States, and establish 3 new genera. P. U. S. Nat. Mus. v. pp. 412–437.

Bean, T. H. Notes on Fishes collected by Capt. Chas. Bendire, U. S. A., in Washington Territory and Oregon, May to October, 1881. P. U. S. Nat. Mus. v. pp. 89–93.

Remarks upon 11 species, with field notes by the collector.

Gill, T. Bibliography of the Fishes of the Pacific Coast of the United States to the end of 1879. Bull. U. S. Nat. Mus. No. 11, 73 pp.

A nearly complete enumeration, in chronological order, of the memoirs and articles of all kinds that have been published on the Fishes of the region in question.

Jordan, D. S., & Gilbert, C. H. List of Fishes collected by Lieut. Henry E. Nichols, U. S. N., in the Gulf of California and on the West Coast of Lower California, with descriptions of four new species. P. U. S. Nat. Mus. iv. pp. 273–279.

——, ——. Catalogue of the Fishes collected by Mr. John Xantus at Cape San Lucas, which are now in the United States National Museum, with descriptions of eight new species. P. U. S. Nat. Mus. v. pp. 353–371.

——, ——. List of a collection of Fishes made by Mr. L. Belding near Cape San Lucas, Lower California. *L. c.* pp. 378–381.

GOODE, G. B., & BEAN, T. H. A list of the species of Fishes recorded as occurring in the Gulf of Mexico. P. U. S. Nat. Mus. v. pp. 234–240.

JORDAN, D. S., & GILBERT, C. H. List of Fishes collected by John Xantus at Colima, Mexico. P. U. S. Nat. Mus. v. pp. 371 & 372.

D. S. JORDAN & C. H. GILBERT give a list of the Fishes collected by Gilbert at Mazatlan, Mexico. Bull. U. S. Fish Comm. 1882, pp. 105–108.

172 species are recorded.

JORDAN, D. S., & GILBERT, C. H. Descriptions of 33 new species of Fishes from Mazatlan, Mexico. P. U. S. Nat. Mus. iv. pp. 338–365.

——, ——. A Review of the Siluroid Fishes found on the Pacific Coast of Tropical America, with descriptions of 3 new species. Bull. U. S. Fish Comm. 1882, pp. 31–54.

20 species are recorded, 19 of which are apparently valid. 11 known and 3 unknown species are described, and the synonymy of the remainder given.

C. H. GILBERT gives a list of the Fishes observed at Punta Arenas, on the Pacific Coast of Central America. Bull. U. S. Fish Comm. 1882, p. 112.

24 species are recorded.

D. S. JORDAN & C. H. GILBERT give a list of the Fishes collected by Gilbert at Panama. Bull. U. S. Fish Comm. 1882, pp. 109–111.

148 species are recorded.

JORDAN, D. S., & GILBERT, C. H. List of Fishes collected at Panama by Captain John M. Dow, now in the United States National Museum. P. U. S. Nat. Mus. v. pp. 373–378.

——, ——. List of Fishes collected at Panama, by Rev. Mr. Rowell, now preserved in the United States National Museum. *L. c.* pp. 381 & 382.

F. POEY gives a list of the Food Fishes brought from Key West, Florida, into the Markets of Havana. Bull. U. S. Fish Comm. 1882, p. 118.

15 species are recorded.

STEINDACHNER, F. Beiträge zur Kenntniss der Flussfische Südamerika's. III. Denk. Ak. Wien, xliv. pp. 1–18, 5 pls.

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Remains of 3 new species are described.

Kramberger-Gorjanovic, D. Die Jungtertiäre Fischfauna Croatiens. Beitr. Pal. Oesterr.-Ung. ii. pp. 86–135, pls. xxi.–xxviii.

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PALÆICHTHYES.

CHONDROPTERYGII.

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——. Glycogène chez les Embryons de Squale. *L. c.* p. 405.

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Carcharias platyodon (Poey) ?, described by Jordan & Gilbert; P. U. S. Nat. Mus. v. p. 243.

Carcharias fronto, p. 102, Mazatlan, *æthalorus*, p. 104, Mazatlan, *longurio*, p. 106, Mazatlan, and *lamiella*, p. 110, San Diego, California, spp. nn., Jordan & Gilbert, *l. c.*

Zygæna malleus, Shaw, described and figured by McCoy, Prodr. Z. Vict., Dec. vi. p. 23, pl. lvi. fig. 1 [1881].

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Platyrrhina schœnleini, M. & H., described and figured by Steindachner, Denk. Ak. Wien, xliv. p. 50, pl. vii.

Pteroplatea vaillanti, Rochebr., figured by Rochebrune, Act. Soc. L. Bord. vi. pl. ii. figs. 1–3.

Cephaloptera rochebrunii, Vaill., figured by Rochebrune, *l. c.* pl. i. figs. 1 & 2.

Pleuracanthus gracillimus, p. 540, and *horridulus*, p. 541, spp. nn. (foss.), Traquair, Geol. Mag. (2) ix., Blackband Ironstone of Borough Lee, near Edinburgh.

Cynopodius crenulus, Traq. (foss.). Further notes; *id. l. c.* p. 541.

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GANOIDEI.

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Pycnodus bathonicus, sp. n. (foss.) (= *P. affinis*, Sauv. *nec* Nicol.), Sauvage, Bull. Soc. Géol. Fr. (3) viii. p. 527, pl. xix. fig. 1, Jurassic of Boulogne-sur-Mer.

Mesodon morinicus, sp. n. (foss.), *id. l. c.* p. 528, pl. xix. fig. 2, Jurassic of Boulogne-sur-Mer.

Athrodon, g. n. (foss.) Allied to *Pycnodus*; id. *l. c.* p. 530. *A. douvillii*, p. 530, and *bolonicnsis*, p. 531, spp. nn., *id. ibid.*, Jurassic of Boulogne-sur-Mer.

Strepsodus striatulus, sp. n. (foss.), Traquair, Geol. Mag. (2) ix. p. 544, Blackband Ironstone of Borough Lee, near Edinburgh.

Elonichthys pectinatus, Traq. (foss.), notes by Traquair, *l. c.* p. 545.

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piscatori[us], *Ctenol[abrus]*, *Cottus grænlandicus*, *Cyclopterus lumpus*, *Gasterosteus aculeatus*, *[Lab]rus cæruleus*, *Motella argentea*, *Gadus morrhua*, *Fundulus nigrofasciatus*, *Osmerus mordax*.

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Percidæ.

Labrax neumayri, p. 97, pl. xxii. fig. 5, *multipinnatus*, p. 99, pl. xxiii. fig. 2, and *intermedius*, p. 100, pl. xxii. fig. 6, Kramberger-Gorjanovic, Beitr. Pal. Oesterr.-Ung. ii.; spp. nn. (foss.), Tertiary of Croatia.

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Serranus caninus, Val., described and figured, *id. l. c.* p. 65, pl. ii. fig. 1.

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The author is of opinion that *Chelmon*, and not *Toxotes*, shoots drops of water at the insects.

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Mullidæ.

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Sparidæ.

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Sargus belloti, sp. n., Steindachner, Anz. Ak. Wien, 1882, p. 41, Canary Islands and Goree.

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Chrysophrys brusinai, sp. n. (foss.), Kramberger-Gorjanovic, Beitr. Pal. Oesterr.-Ung. ii. p. 107, pl. xxii. fig. 7, Tertiary of Croatia.

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Scorpænidæ.

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Sebastichthys umbrosus, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. v. p. 410, near Santa Barbara, California.

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Scorpæna senegalensis, Steind., described and figured by Steindachner, Denk. Ak. Wien, xliv. p. 31, pl. iv.

Scorpæna stearnesi, p. 421, and *calcarata*, p. 422, spp. nn., Goode & Bean, P. U. S. Nat. Mus. v., Florida.

Scorpæna pilari, p. 109, pl. xxii. fig. 1, and *minima*, p. 110, pl. xxii. fig. 2, Kramberger-Gorjanovic, Beitr. Pal. Oesterr.-Ung. ii. spp. nn. (foss.), Tertiary of Croatia.

Berycidæ.

Trachichthys jacksoniensis, sp. n., Macleay, P. Linn. Soc. N. S. W. v. p. 511, Port Jackson. [Omitted from the preceding Record.]

Xenichthys xenurus, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. iv. p. 454, San Salvador.

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Poromitra, g. n., Goode & Bean, Bull. Mus. C. Z. x. p. 214, *P. capito*, sp. n., *iid. l. c.* p. 215, Atlantic, 34° N. lat., 75° W. long., 1632 fath.

Kurtidæ.

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Polynemidæ.

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Sciænidæ.

Micropogon ectenes, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. iv. p. 355, Mazatlan.

Umbrina roncador, sp. n., *iid. l. c.* p. 277, West Coast of Lower California.

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Xiphiidæ.

G. ...GOODE has a paper on the taxonomic relations and geographical distribution of the members of this family, also giving diagnoses of the family, subfamilies, and genera, and an indication of the species; P. U. S. Nat. Mus. iv. pp. 415–433.

Trichiuridæ.

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Carangidæ.

Caranx rhonchus, Geoffr., p. 34, and *goreensis*, C. & V., p. 35, described by Steindachner, Denk. Ak. Wien, xliv.

Caranx nobilis, p. 532, Port Jackson, and *radiatus*, p. 537, Rockingham Bay, spp. nn., Macleay, P. Linn. Soc. N. S. W. v. [Omitted from the preceding Record.]

Caranx vinctus, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. iv. p. 349, Mazatlan.

Caranx haueri, p. 126, pls. xxvi. figs. 3 & 4, xxvii. fig. 1, *gracilis*, p. 128, pl. xxvii. figs. 2–4, and *longipinnatus*, p. 128, pl. xxiv. figs. 7 & 8; Kramberger-Gorjanovic, Beitr. Pal. Oesterr.-Ung. ii. spp. nn. (foss.), Tertiary of Croatia.

Seriola dumerili, Risso, described; Steindachner, *l. c.* p. 36.

Lichia amia (Lacép.), described; *id. l. c.* p. 38.

Sparactodon natal, Rochebr., figured by Rochebrune, Act. Soc. L. Bord. vi. pl. iv. fig. 2.

Proantigonia, g. n. (foss.) between *Antigonia* and *Capros*, Kra[illegible] Gorjanovic, Beitr. Pal. Oesterr.-Ung. ii. p. 130. *P. radobojana*, p[illegible] pl. xxvii. figs. 5 & 6, and *steindachneri*, p. 132, pl. xxvii. fig. 7, spp. nn. (foss.), *id. l. c.*, Tertiary of Croatia.

Coryphænidæ.

Schedophilus medusophagus, Cocco. Description and figure of a specimen captured on the British Coast; A. Günther, Tr. Z. S. xi. p. 223, pl. xlvii.

Scombridæ.

Scomber priscus, sp. n. (foss.), Kramberger-Gorjanovic, Beitr. Pal. Oesterr.-Ung. ii. p. 119, pl. xxiv. fig. 3, Tertiary of Croatia.

Thynnus thynnus (L.), described and figured by McCoy, Pr. Zool. Vict., Dec. v. p. 21, pl. xliv. fig. 2 [1880].

Pelamys australis, sp. n., Macleay, P. Linn. Soc. N. S. W. v. p. 557, Port Jackson. [Omitted from the preceding Record.]

Auxis croaticus, p. 121, pl. xxv. fig. 1, *vrabceensis*, p. 122, pl. x[illegible]ig. 4, *minor*, p. 123, pl. xxiv. figs. 5 & 6, and *thynnoides*, p. 125, pl. xxvi. figs. 1 & 2; Kramberger-Gorjanovic, Beitr. Pal. Oesterr.-Ung. ii.: spp. nn. (foss.), Tertiary of Croatia.

Thersites atun, Cuv., described and figured by McCoy, *l. c.* p. 19, pl. xliv. fig. 1 [1880].

Luvarus imperialis, Raf. Extensive notes on the anatomy and physiology of this fish, by Béla Haller, Vergl. Physiol. Stud. i. pt. iv. p. 1, pls.

On the anatomy of the eye of the same; E. Berger, *l. c.* p. 21, pls. [Omitted from the preceding Record.]

Trachinidæ.

Uranoscopus chinensis, Guich., described by Sauvage, Bull. Soc. Philom. (7) vi. p. 169.

Trachinus draconculus, Heck. (foss.), described and figured; Kramberger-Gorjanovic, Beitr. Pal. Oesterr.-Ung. ii. p. 111, pl. xxii. figs. 3 & 4.

Opisthognathus jacksoniensis, sp. n., Macleay, P. Linn. Soc. N. S. W. v. p. 570, Port Jackson. [Omitted from the preceding Record.]

Opisthognathus rhomaleus, Santa Maria, Lower California, p. 276, and *O. lonchurus*, Gulf of Mexico, p. 290, Jordan & Gilbert, P. U. S. Nat. Mus. iv., spp. nn.

Opisthognathus scaphiurus, sp. n., Goode & Bean, P. U. S. Nat. Mus. v. p. 417, Florida.

Cichlops filamentosus, sp. n., Macleay, *l. c.* p. 570, Port Darwin. [Omitted from the preceding Record.]

Batrachidæ.

Porichthys plectrodon, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. v. p. 291, Gulf of Mexico.

Pediculati.

Lophius piscatorius, L. Notes on the osteology of this fish; Morrow, P. N.-Scot. Inst. 1882, pp. 340–357.

Malthe elater, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. iv. p. 365, Mazatlan.

Antennarius asper, sp. n., Macleay, P. Linn. Soc. N. S. W. v. p. 580, Darnley Island. [Omitted from the preceding Record.]

Cottidæ.

Cottus lilljeborgi, Collett. Remarks by A. W. Malm, Göteb. Nat. Mus. Arsskr. iii. 1881 [1882], p. 21.

Cottus thomsoni, sp. n., Günther, P. R. Soc. Edinb. xi. p. 679, Færöe Channel (555 fath.).

Cottunculus liparis, Collett, is recorded from the Færöe Channel (540 fath.), *id. ibid.*

Cottunculus torvus, sp. n., Goode, Bull. Mus. C. Z. x. p. 212, Atlantic, 33°–41° N. lat., 65°–76° W. long., 464–732 fath.

Platycephalus castelnaui, sp. n., Macleay, P. Linn. Soc. N. S. W. v. p. 587, King George's Sound. [Omitted from the preceding Record.]

Trigla nigripes, Malm. Notes by A. W. Malm, *l. c.* p. 22.

Prionotus alatus, sp. n., Goode & Bean, Bull. Mus. C. Z. x. p. 210, 32° N. lat., 78° W. long., 75 fath.

Prionotus scitulus, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. v. p. 288, Gulf of Mexico.

Uranidea pollicaris, sp. n., *id. l. c.* p. 222, Lake Michigan. *U. rhotea*, sp. n., Rosa Smith, *tom. cit.* p. 347, Washington Territory.

DISCOBOLI.

Liparis liparis, L., is recorded from the Færöe Channel (540 fath.); Günther, P. R. Soc. Edinb. xi. p. 679.

Gobiidæ.

Gobius fluviatilis, Bon., figured by Fatio, Vert. Suisse, iv. pt. 1, pl. i. figs. 2–4.

Gobius casamancus, Rochebr., figured by Rochebrune, Act. Soc. L. Bord. vi. pl. v. figs. 1 & 2.

Gobius castelnaui, p. 598, Hobson's Bay, *semifrenatus*, p. 598, Port Jackson, *gibbosus*, p. 601, Endeavour River, *lateralis*, p. 602, King George's Sound, *flavidus*, p. 602, Port Jackson, *scabriceps*, p. 603, Endeavour River, and *cristatus*, p. 610, Port Jackson, spp. nn., Macleay, P. Linn. Soc. N. S. W. v. [Omitted from the preceding Record.]

Gobius rhombo-maculatus, sp. n., János Károli, Term. füzetek, v[illegible] Borneo.

Gobius bolcosoma, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. v. p. 295, Gulf of Mexico.

Gobius stigmaturus, sp. n., Goode & Bean, P. U. S. Nat. Mus. v. p. 418, S. United States.

Gobius nicholsi, sp. n., Bean, P. U. S. Nat. Mus. iv. p. 469, British Columbia.

Gobius uranoscopus, sp. n., Sauvage, Bull. Soc. Philom. (7) vi. p. 170, Brazil.

Gobius pullus, sp. n. (foss.), Kramberger-Gorjanovic, Beitr. Pal. Oesterr.-Ung. ii. p. 133, pl. xxv. fig. 2, Tertiary of Croatia.

Saccostoma, g. n. (Guichenot, MS.). Habit of *Gobius*, but the mouth-opening very large, upper maxillary produced posteriorly; Sauvage, *l. c.* p. 171. *S. gulosus* [*-um*], sp. n., *id. ibid.*, Japan.

Gobiosoma zosterarum [? *-rarum*], sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. iv. p. 361, Mazatlan.

Gobiosoma ios, sp. n., *iid. op. cit.* v. p. 437, Vancouver's Island.

Periophthalmus erythronotus, Guich. Remarks on its habits; Rochebrune, Act. Soc. L. Bord. vi. p. 112.

Eleotris muralis, Q. & G., described by Sauvage, *l. c.* p. 172.

Eleotris mastersi, p. 623, Rope's Creek, and *taniura*, p. 624, Low Island, spp. nn., Macleay, *l. c.* [Omitted from the preceding Record.]

Eleotris maltzani, sp. n., Steindachner, Denk. Ak. Wien, xliv. p. 40, Rufisque, Senegambia.

Culius æquidens, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. iv. p. 461, Mazatlan.

Callionymus calcaratus and *lateralis*, spp. nn., Macleay, *l. c.* p. 628, Port Jackson. [Omitted from the preceding Record.]

Callionymus macrocephalus, sp. n. (foss.), Kramberger-Gorjanovic, *l. c.* p. 134, pl. xxv. fig. 3, Tertiary of Croatia.

Ioglossus, g. n., closely allied to *Oxymetopon*, Blkr., but differing from it in the absence of a keel on the head and in the smoothness of nearly all of the scales; Goode & Bean, P. U. S. Nat. Mus. v. p. 419. For *Ioglossus calliurus*, sp. n., *iid. ibid.*, Florida.

Aristeus rufescens, p. 625, Rivers of North Queensland, and *lineatus*, p. 626, Richmond River, spp. nn.; Macleay, *l. c.* [Omitted from the preceding Record.]

Blenniidæ.

Blennius bouvieri, Rochebr., figured by Rochebrune, Act. Soc. L. Bord. vi. pl. v. figs. 3 & 4.

Blennius stearnsi, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. v. p. 300, Gulf of Mexico.

Blennius asterias and *favosus*, spp. nn., Goode & Bean, *tom. cit.* p. 416, Florida.

Blennius castaneus, sp. n., Macleay, P. Linn. Soc. N. S. W. vi p. 5, Port Jackson.

Blennius ater, sp. n., Sauvage, Bull. Soc. Philom. (7) vi. p. 172, Patagonia.

Isesthes ionthas, p. 299, and *scrutator*, p. 300, spp. nn.; Jordan & Gilbert, *l. c.*, Gulf of Mexico.

Isesthes gilberti, sp. n., Jordan, *l. c.* p. 349, Santa Barbara, California.

Petroscirtes fasciolatus, p. 8, *guttatus*, *rotundiceps*, and *cristiceps*, p. 9, spp. nn., Macleay, *l. c.* Port Jackson.

Salarias chiostictus, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. iv. p. 363, Mazatlan.

Salarias cheverti, sp. n., Macleay, *l. c.* p. 12, Darnley Island.

Chasmodes saburræ, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. v. p. 298, Gulf of Mexico.

Clinus pedatipinnis, Rochebr., figured by Rochebrune, Act. Soc. L. Bord. vi. pl. vi. figs. 2–4.

Clinus zonifer, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. iv. p. 361, Mazatlan.

Cristiceps fasciatus, p. 19, *pictus*, p. 25, and *pallidus*, p. 26, spp. nn., Macleay, *ibid.*, Port Jackson.

Stichæus castelnaui, sp. n., Sauvage, *l. c.* p. 172, Cape of Good Hope.

Tripterygium carminale, sp. n., Jordan & Gilbert, *l. c.* p. 362, Mazatlan.

Lepidoblennius geminatus, sp. n., Macleay, *l. c.* p. 13, Port Jackson.

Delolepis, g. n., distinguished from *Cryptacanthodes*, in having the body covered with scales; Bean, P. U. S. Nat. Mus. iv. p. 465. For *Delolepis virgatus*, sp. n., *id. l. c.* p. 466, British Columbia and Alaska.

Sphyrænidæ.

Sphyræna iello, C. & V., described by Steindachner, Denk. Ak. Wien, xliv. p. 39.

Sphyræna croatica, sp. n. (foss.), Kramberger-Gorjanovic, Beitr. Pal. Oesterr.-Ung. ii. p. 112, pl. xxviii. fig. 1, Tertiary of Croatia.

Atherinidæ.

Atherinella eriarcha, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. iv. p. 348, Mazatlan.

Menidia audens, sp. n., Hay, Bull. U. S. Fish Comm. 1882, p. 64, Mississippi, Big Black and Pearl Rivers.

Menidia dentex, sp. n., Goode & Bean, P. U. S. Nat. Mus. v. p. 429, Florida.

Tetragonurus cuvieri. On young of this fish living in the Codfish; Emery, MT. z. Stat. Neap. iii. p. 283.

Mugilidæ.

Mugil oeur, Forsk. (= *cephalotus*, C. & V.), described by Steindachner, Denk. Ak. Wien, xliv. p. 40.

Mugil hoefleri, sp. n., Steindachner, Anz. Ak. Wien, 1882, p. 42, Goree

Mugil radobojanus, sp. n. (foss.), Kramberger-Gorjanovic, Beitr. Pal. Oesterr.-Ung. ii. p. 114, pl. xxviii. figs. 2–4, Tertiary of Croatia.

Myxus curvidens (C. & V.), described by Steindachner, Denk. Ak. Wien, xliv. p. 42.

Ioturus stipes, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. v. p. 273, Panama.

Gobiesocidæ.

Gobiesox zebra, p. 359, *eos*, p. 360, *erythrops*, p. 360, and *adustus*, p. 360, spp. nn., Jordan & Gilbert, P. U. S. Nat. Mus. iv., Mazatlan.

Gobiesox virgatulus, sp. n., *iid. op. cit.* v. p. 293, Gulf of Mexico.

Ophiocephalidæ.

Ophiocephalus bivittatus, sp. n., János Károli, Term. füzetek, v. p. 170, Borneo.

Luciocephalidæ.

Regalœcus jacksonensis, sp. n., Ramsay, P. Linn. Soc. N. S. W. v. p. 631, pl. xx. Manly Beach. [Omitted from the preceding Record.]

Trachypteridæ.

C. Lütken has extensive remarks on *Trachypterus arcticus* and *Gymnetrus banksi*, the latter being figured, p. 209 ; Vid. Medd. 1881, pp. 190–227.

ACANTHOPTERYGII PHARYNGOGNATHI.

Pomacentridæ.

Pomacentrus dolii, sp. n., Macleay, P. Linn. Soc. N. S. W. vi. p. 65, pl. i. fig. 1.

Pomacentrus madagascariensis, sp. n., Sauvage, Bull. Soc. Philom. (7) vi. p. 174, Madagascar.

Pomacentrus hamii, Rochebr., figured by Rochebrune, Act. Soc. L. Bord. vi. pl. iii. fig. 2.

Glyphidodon hœfleri, Steind., described and figured by Steindachner, Denk. Ak. Wien, xliv. p. 43, pl. v. fig. 2.

Heliastes bicolor, Rochebr., figured by Rochebrune, *l. c.* pl. iii. fig. 3.

Labridæ.

Platyglossus xanti, sp. n., János Károli, Term. füzetek, v. p. 174, Singapore.

Platyglossus florealis, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. v. p. 287, Gulf of Mexico.

Iulis verticalis, p. 135, and *clepsydralis*, p. 136, spp. nn., R. Smith & J. Swain, *l. c.*, Johnston's Island.

Coris pallida, sp. n., Macleay, P. Linn. Soc. N. S. W. vi. p. 100, Endeavour River.

Odax brunneus, sp. n., *id. l. c.* p. 109, Port Jackson.

Scarus (Hemistoma) perrico, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. iv. p. 357, Mazatlan.

Pseudocarus hæfleri, Steind., described and figured by Steindachner, Denk. Ak. Wien, xliv. p. 46, pl. vi. fig. 2.

Chromides.

Chromis cæruleo-maculatus, Rochebr., pl. iv. fig. 3, and *faidherbii*, Rochebr., pl. v. fig. 5, figured by Rochebrune, Act. Soc. L. Bord. vi.

Chromis enchrysurus, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. v. p. 286, Gulf of Mexico.

Ptychochromis grandidieri, sp. n., Sauvage, Bull. Soc. Philom. (7) vi. p. 174, Madagascar.

Hemichromis desguezi, Rochebr., figured by Rochebrune, *l. c.* pl. v. fig. 6.

Hemichromis guentheri, sp. n., Sauvage, Bull. Soc. Z. Fr. 1882, p. 317, pl. v. fig. 1, Gold Coast.

Mesonauta surinamensis, sp. n., Sauvage, Bull. Soc. Philom. (7) vi. p. 173, Surinam.

Crenicichla elegans, sp. n., Steindachner, Denk. Ak. Wien, xliv. p. 15, Peru.

ANACANTHINI.

Lycodidæ.

Lycodes murænus and *pallidus*, Collett, are recorded from the Færöe Channel at a depth of 540 fath.; Günther, P. R. Soc. Edinb. xi. p. 679.

Lycodes paxilloides, sp. n., Goode & Bean, Bull. Mus. C. Z. x. p. 207, Atlantic, 39–40° N. lat., 68–70° W. long., 304–466 fath.

Lycodes kieneri. This name is given provisionally to a young specimen of *Lycodes* from the British Coast, erroneously referred by Günther to *Anguilla kieneri*. F. Day, P. Z. S. 1882, p. 536, woodcut.

Lycodonus, g. n.; in nearly every particular like *Lycodes*, from which it is distinguished by the peculiar structure of the dorsal and anal fins, the rays of which are supported laterally each by a pair of sculptured ectodermal scutes or plates. *L. mirabilis*, sp. n., Goode & Bean, *l. c.* p. 208, Atlantic, 38° N. lat., 73° W. long., 740 fath.

Gadidæ.

Gadus. C. Lütken has notes on some Arctic species of this genus. Vid. Medd. 1881, pp. 253–255.

On blindness in the Codfish; Day, Zool. xl. p. 191.

Gadus collarius, taken on the Banffshire Coast, and described by Edwards, Zool. 1882, p. 23.

Haloporphyrus lepidion, Risso, Færöe Channel (530 & 555 fath.); Günther, P. R. Soc. Edinb. xi. p. 679.

Lotella marginata, sp. n., Macleay, P. Linn. Soc. N. S. W. vi. p. 114, Port Jackson.

Lotella grandis, sp. n., Ramsay, *op. cit.* v. p. 462, Wollongong. [Omitted from the preceding Record.]

Læmonema barbatula, sp. n., Goode & Bean, Bull. Mus. C. Z. x. p. 204, Atlantic, 32° N. lat., 77–78° W. long., 225–233 fath.

Motella. C. Lütken has a paper on the Northern species of this genus, viz., *M. mustela* (L.), *septentrionalis*, Coll., *cimbria* (L.), *mediterranea* (L.), *vulgaris* (Cuv.), *reinhardti*, Kr., and *ensis*, Rhdt.; Vid. Medd 1881, pp. 228–252.

Motella macrophthalma, Stier., Færöe Channel (540 fath.); Günther, P. R. Soc. Edinb. xi. p. 680.

Brosmius brosme, Müll., Færöe Channel (530 fath.); Günther, P. R. Soc. Edinb. xi. p. 680.

Ophidiidæ.

Barathrodemus, g. n. (*Brotulina*) for *B. manatinus*, sp. n., Goode & Bean, Bull. Mus. C. Z. x. p. 200, Atlantic, 33° N. lat., 76° W. long., 647 fath.

Dicrolene, g. n., for *D. intro-niger*, sp. n., *iid. l. c.* p. 202, 33° N. lat., 76° W. long., 464–647 fath.

Fierasfer acus. C. Emery has additional notes on the synonymy of this fish. MT. z. Stat. Neap. iii. pp. 281 & 282.

Fierasfer arenicola, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. iv. p. 363, Mazatlan.

Genypterus omostigma, sp. n., *iid. op. cit.* v. p. 301, Gulf of Mexico.

Macruridæ.

Macrurus trachy[r]rhynchus, Giorna Two young specimens, possibly belonging to this species, are recorded from the Færöe Channel at a depth of 555 fath.; Günther, P. R. Soc. Edinb. xi. p. 680.

Macrurus cælorrhynchus. On the juvenile form of this fish; L. Facciola, Boll. scient. iv. pp. 9–13, figs.

Macrurus asper, sp. n., Goode & Bean, Bull. Mus. C. Z. x. p. 196, Atlantic, 40–41° N. lat., 65–68° W. long., 304–1242 fath.

Coryphænoides carapinus, sp. n., Goode & Bean, *l. c.* p. 197, Atlantic, 38–41° N. lat., 65–73° W. long., 922–1242 fath.

Chalinura, g. n., Goode & Bean, *l. c.* p. 198. *C. simula*, sp. n., *iid.* p. 199, Atlantic, 31–41° N. lat., 65–78° W. long., 333–1242 fath.

Pleuronectidæ.

Platophrys mancus (Brouss.), described by R. Smith & J. Swain, P. U. S. Nat. Mus. v. p. 142.

Rhombus hybridus. Notes by A. W. Malm, Göteb. Mus. Arsskr. iii. 1881 [1882], p. 24.

Arnoglossus soleiformis, Malm. Notes by A. W. Malm, *ibid.*

Arnoglossus lophotes, Gthr., = *A. grohmanni*, Bp. ; Day, P. Z. S. 1882, p. 748, pl. liii.

Citharichthys stigmæus, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. v. p. 411, Santa Barbara, California.

Hemirhombus pœstulus, sp. n. (Bean, MS.) *iid. l. c.* p. 304, Gulf of Mexico; Goode & Bean, *tom. cit.* p. 414.

Etropus, g. n., for *E. crossotus*, sp. n , Jordan & Gilbert, P. U. S. Nat. Mus. iv. p. 364, Mazatlan and Panama.

Paralichthys albigutta, p. 302, and *squamilentus*, p. 303, spp. nn., *iid. op. cit.* v., Gulf of Mexico.

Nothosema, g. n., distinguished from *Paralichthys* on account of its elongated ventral fin, the triangular elongation of the anterior rays of the dorsal, and the highly ctenoid character of the scales upon the coloured side of the body; Goode & Bean, Bull. Mus. C. Z. x. p. 192. *N. dilecta*, sp. n., *iid. l. c.* p. 193, Atlantic, 32° N. lat., 78° W. long., 75 fath.

Pleuronectes platessa. On varieties ; A. W. Malm, *l. c.* p. 23.

Solea macleayana, sp. n., Ramsay, P. Linn. Soc. N. S. W. v. p. 462, Manly Beach. [Omitted from the preceding Record.]

Baiostoma, g. n., distinguished from *Achirus* by the presence of a pectoral fin on the eyed side; Bean, P. U. S. Nat. Mus. v. p. 413. *B. brachialis*[*-le*], sp. n., *id. ibid.*, South Florida.

Aphoristia nebulosa, sp. n., Goode & Bean, *l. c.* p. 192, Atlantic, 32° N. lat., 78° W. long, 229 fath.

Synaptura lipophthalma, sp. n., János Károli, Term. füzetek, v. p. 176, Borneò.

Cynoglossus goreensis, Goree, and *canariensis*, Canary Islands, spp. nn., Steindachner, Anz. Ak. Wien, 1882, p. 42.

"Eurypharyngidæ."

Eurypharynx, g. n., type of a new family, having affinities with the Anacanthins, Physostomes, such as *Scopelidæ* and *Stomiatidæ*, and also with the Apodals. *E. pelecanoides*, sp. n., Vaillant, C. R. xcv. p. 1226, off the Coast of Morocco, at a depth of 2300 metres.

PHYSOSTOMI.

Siluridæ.

Clarias læviceps, Gill, described and figured by Sauvage, Bull. Soc. Z. Fr. 1882, p. 318, pl. v. fig. 2.

Clarias submarginatus, sp. n., Peters, SB. nat. Fr. 1882, p. 374, Tooxlong River, W. Africa.

Heterobranchus senegalensis, C. & V., described and figured by Rochebrune, Act. Soc. L. Bord. vi. p. 141, pl. vi. fig. 1.

Silurus chantrii, sp. n., Sauvage, Bull. Soc. Philom. (7) vi. p. 163, Tiflis.

Eutropius bocagii, sp. n., Guimarães, J. Sci. Lisb. 1882, p. 222, Doudo, Angola.

Piramutana piramuta (Kner), described and figured by Steindachner, Denk. Ak. Wien, xliv. p. 2, pl. iv.

Piratinga goliath (Heck.), described and figured by Steindachner, *l. c.* p. 1, pl. iii.

Arius brandti, Steind., p. 39, *kessleri*, Steind., p. 40, *planiceps*, Steind., p. 42, *platypogon*, Gthr., p. 44, *assimilis*, Gthr., p. 47, *guatemalensis*, Gthr., p. 48, *dowi*, Gill, p. 50, *dasycephalus*, Gthr., p. 51, and *hypophthalmus*, Steind., p. 53, described by Jordan & Gilbert, Bull. U. S. Fish Comm. 1882.

Arius insculptus, p. 41, *elatturus*, p. 45, and *osculus*, p. 46, spp. nn., *iid. l. c.*, Panama.

Æluichthys pinnimaculatus, Steind., and *panamensis*, Gill, described by Jordan & Gilbert, *l. c.* pp. 34–36.

Ageniosus brevis, sp. n., Steindachner, *l. c.* p. 16, Amazons.

Ecanemus longipinnis, sp. n. (Agass. MS.), *id. l. c.* p. 17, Hyavary.

Centromochlus perugiæ, sp. n., Steindachner, Anz. Ak. Wien, 1882, p. 178, Canelos, Ecuador.

Cetopsis plumbeus, sp. n., *id. l. c.* p. 178, Canelos, Ecuador.

Oxydoras stuebeli, sp. n., *id. l. c.* p. 175, Huallaga River.

Chætostomus nigro-lineatus, Ptrs., remarks by Steindachner, Denk. Ak. Wien, xliv. p. 7.

Chætostomus taczanowskii, sp. n., Steindachner, Anz. Ak. Wien, 1882, p. 177, Rio de Tortora, Peru.

Plecostomus auro-guttatus, Kner, remarks by Steindachner, Denk. Ak. Wien, xliv. p. 6.

Arges (= *Brontes*, C. & V.) *longifilis*, sp. n., Steindachner, Anz. Ak. Wien, 1882, p. 177, Rio Huambo and Rio de Tortora, Peru.

Loricaria stuebeli, sp. n., *id. l. c.* p. 175, Huallaga River.

Loricaria spixi, sp. n., *id.* Denk. Ak. Wien, xliv. p. 4, pl. ii., S.E. South America.

Loricaria lima, Kner, additional remarks and figure; *id. l. c.* p. 6, pl. i.

Acestra kneri, sp. n., Steindachner, Anz. Ak. Wien, 1882, p. 177, Canelos, Ecuador.

Bunocephalus bicolor, Huallaga River, and *kneri*, Canelos, spp. nn., *l. c.* p. 176.

Heptapterus colletti, sp. n., *id.* Denk. Ak. Wien, xliv. p. 7, pl. v. fi[illegible] Maldonado or La Plata.

Trichomycterus taczanowskii, p. 117, Rio Huambo and Rio de Tortora, Peru, and *amazonicus*, p. 178, Cudajas, spp. nn., *id.* Anz. Ak. Wien, 1882, p. 178.

Trichomycterus kneri, sp. n., *id.* SB. Ak. Wien, p. 81, pl. v. fig. 1, Ecuador.

Stegophilus reinhardti and *macrops*, spp. nn., *id.* Anz. Ak. Wien, 1882, p. 178, Amazons.

Scopelidæ.

Scopelus. Note on the pearly organs in this genus; H. B. Guppy, Ann. N. H. (5) ix. p. 202, woodcut.

Bathysaurus agassizi, sp. n., Goode & Bean, Bull. Mus. C. Z. x. p. 215, Atlantic, 33° N. lat., 76° W. long., 647 fath.

Aulopus purpurisatus, Rich., described and figured by McCoy, Prodr. Zool. Vict., Dec. vi. p. 19, pls. liv. & lv.

Synodus scituliceps, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. iv. p. 344, Mazatlan.

Synodus intermedius (Spix) ?, described; *iid. op. cit.* v. p. 249.

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Cyprinus gibelio, Bloch. A. A. Nesbit gives notes of experiments on the action of coloured light on this fish; J. Sci. (3) iv. pp. 350 & 732.

Barbus meridionalis, Risso. Notes upon and figure by Steindachner, SB. Ak. Wien, lxxxvi. Abth. i. p. 69, pl. ii. fig. 1.

Barbus microphthalmus, p. 164, Tiflis, and *lorteti*, p. 165, Antioch, spp. nn., Sauvage, Bull. Soc. Philom. (7) vi.

Puntius (*Barbodes*) *camptacanthus*, Blkr., described by Sauvage, Bull. Soc. Z. Fr. 1882, p. 322.

Labeobarbus chantrii, p. 165, *orontis*, p. 166, Antioch and Orontes, *euphrati*, p. 166, Euphrates, spp. nn., Sauvage, Bull. Soc. Philom. (7) vi.

Tirodon, g. n. Distinguished from *Hybognathus* in having two rows of pharyngeal teeth instead of one; Hay, Bull. U. S. Fish Comm. 1882, p. 68. *T. amnigenus*, sp. n., *id. l. c.* p. 68, Pearl River at Jackson, Miss.

Tylognathus cantini, sp. n., Sauvage, *l. c.* p. 175, Abyssinia.

Leuciscus aula, Bp., figured by Fatio, Vert. Suisse, iv. pt. i. pl. v. fig. 1.

Squalius agassizi, Heck., figured, *id. ibid.* pl. i. fig. 1.

Pachychilon, subg. n., for *Leuciscus pictus* (Heck. & Kner), Steindachner, *l. c.* p. 71, the species figured, pl. iii.

Paraphoxinus pstrossi, Steindachner, *l. c.* p. 73, pl. v. fig. 3, and *ghetaldi*, id. Anz. Ak. Wien, 1882, p. 43, spp. nn., Herzegovina.

Abramidopsis buggenhagi (Bl.). Notes by A. W. Malm, Göteb. Nat. Mus. Arsskr. iii. 1881 [1882], p. 25.

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Cobitis tænia, L., figured by Fatio, *l. c.* pl. v. fig. 2. E. Cantoni writes on the variability of this fish in the neighbourhood of Pavia, and distinguishes the following varieties:—*puta*, var. n., p. 362, fig. 1, *septa*, var. n., p. 363, fig. 2, *conspersa*, var. n., p. 364, fig. 3, and *bilineata*, Canestr., p. 365, fig. 4; Rend. Ist. Lomb. (2) xv.

Characinidæ.

Curimatus nægeli, sp. n. (?), Steindachner, Denk. Ak. Wien, xliv. p. 11, Rio Janeiro.

Curimatus nasus, Steindachner, SB. Ak. Wien, lxxxvi. Abth. i. p. 80,

pl. v. fig. 2, Ecuador, and *meyeri*, id., Anz. Ak. Wien, 1882, p. 176, Huallaga River : spp. nn.

Saccodon cranocephalum, sp. n., Thominot, Bull. Soc. Philom. (7) vi. p. 248, Ecuador. The author proposes to establish for the genera *Saccodon*, *Hemiodus*, *Parodon*, *Citharinus*, *Prochilodus*, and *Cœnotropus* a new subfamily, *Citharina* ; a synopsis of the genera is given, p. 250.

Alestes chaperi, sp. n., Sauvage, Bull. Soc. Z. Fr. 1882, p. 320, pl. v. fig. 3, Gold Coast.

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Chirodon eques, p. 179, Obidos, Brazil *agassizi*, p. 180, Jatuarana, *pequira*, p. 180, Rio Guaporé, and *nattereri*, p. 180, Obidos, *id. l. c.* : spp. nn.

Brycon stuebeli, sp. n., *id. l. c.* p. 176, Amazons.

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Cyprinodontidæ.

Lebias calaritans. Observations by Lepori ; Atti Acc. Rom. (3) iv. pp. 481–488.

H. E. Sauvage describes *Cyprinodon calaritanus* (Bon.), *fasciatus* (Val.), *iberus*, C. & V., and *hammonis*, C. & V., the latter being figured. Mission G. Revoil aux Pays Çomalis, Faune et Flore ; Note sur les *Cyprinodon* du groupe du *C. calaritanus*, 12 pp. 1 pl.

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Cyprinodon nydrus, sp. n., Goode & Bean, P. U. S. Nat. Mus. v. p. 433, Pensacola, Florida.

Characodon furcidens, sp. n., Jordan & Gilbert, *l. c.* p. 354, Cape San Lucas, California.

Haplochilus chaperi, p. 323, pl. v. fig. 5, and *petersi*, p. 324, pl. v. fig. 6, spp. nn., Sauvage, Bull. Soc. Z. Fr. 1882, Gold Coast.

Fundulus similis (Gir.), p. 252, and *grandis*, Gir., p. 253, described by Jordan & Gilbert, *l. c.*

Fundulus ocellaris, p. 254, and *xenicus* (= *Adinia multifasciata*, Gir., *nec* Lesueur), p. 255, spp. nn., *iid. l. c.*, Gulf of Mexico.

Fundulus vinctus and *extensus*, spp. nn., *iid. l. c.* p. 355, Cape San Lucas, California.

Zygonectes inurus, sp. n., *iid. l. c.* p. 143, South Illinois.

Zygonectes craticula, sp. n., Goode & Bean, *l. c.* p. 433, Florida.

Cynolebias bellotti, p. 9, pl. v. fig. 2, *maculatus*, p. 10, pl. v. fig. 3, and *elongatus*, p. 11, spp. nn., Steindachner, Denk. Ak. Wien, xliv., La Plata.

Lucania venusta, Gir., described by Jordan & Gilbert, *l. c.* p. 256.

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Chologaster papilliferus, sp. n., Forbes, *l. c.* p. 2, Southern Illinois.

UMBRIDÆ.

Umbra canina (Marsili). Notes by János Károli, Term. füzetek, v. pp. 188-191; figured with notes by Otto Herman, *tom. cit.* p. 191, pl. iv.; German summary at p. 274.

SCOMBRESOCIDÆ.

Belone choram (Forsk.), described by Steindachner, Denk. Ak. Wien, xliv. p. 47.

Tylosurus gladius, sp. n., Goode & Bean, P. U. S. Nat. Mus. v. p. 430, Florida.

Tylosurus sierrita, p. 458, and *fodiator*, p. 459, Jordan & Gilbert, P. U. S. Nat. Mus. iv., Mazatlan, spp. nn.

Chriodorus, g. n., Goode & Bean, *l. c.* p. 431. *C. atherinoides*, sp. n., *id. l. c.* p. 432, Florida.

Exocœtus holubi, sp. n. (?), Steindachner, *l. c.* p. 54, Equatorial Coast of W. Africa.

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Esox lucius. On the development of the bones of the head; Walther, Jen. Z. Nat. xvi. pp. 60–87, pls. iii. & iv.

MORMYRIDÆ.

Mormyrus cobitiformis, p. 72, Tooxlong River, W. Africa, *tenuirostris*, p. 73, Ukamba, E. Africa, and *hildebrandti*, p. 73, Ukamba, Peters, SB. Nat. Fr. 1882: spp. nn.

STERNOPTYCHIDÆ.

Cyclothone, g. n. for *C. lusca*, sp. n., Goode & Bean, Bull. Mus. C. Z. x. p. 221, Atlantic, 31–34° N. lat., 74–76° W. long., 457–1632 fath.

Stomiatidæ.

Lucifer, g. n. Differing from *Echiostoma*, Lowe, in the arrangement of the inframaxillary teeth, and from *Malacosteus*, Ayres, in the absence of palatine teeth, and from both in the total absence of pectoral fins. *L. albipinnis*, sp. n., Döderlein, Arch. f. Nat. (2) xlviii. p. 26, pl. iii., Japan.

Salmonidæ.

Observations on British *Salmones* by F. Day, P. L. S. xvi. pp. 396–417.

Day, F. Do Salmon spawn in the sea? Zool. xl. p. 153.

——. The Severn Salmon; whence it comes and where it goes. *L. c.* p. 221.

——. On Hybrids between Salmon and Trout. P. Z. S. 1882, p. 751, woodcut.

Instance of gelatinous deposit on a Salmon; J. Dougall, P. Phil. Soc. Glasgow, xiii. p. 584.

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Salmo fario. On "tailless" examples of this species from Loch Enoch, in Kirkcudbrightshire. Traquair, P. Phys. Soc. Edinb. 1882, pp. 221–223.

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Nüsslin, O. Beiträge zur Kenntniss der *Coregonus*-Arten des Bodensees und einiger anderer nahegelegener nordalpiner Seen. Zool. Anz. v. pp. 86–92, 106–111, 130–135, 182–189, 207–212, 253–258, 279–282, & 302–307, woodcuts.

The author discusses the characters which have been used for the distinction of the numerous forms of *Coregonus*, and expresses the opinion that, as concerns the lakes of Switzerland, there exist a number of species greater than that hitherto admitted. He uses, besides other characters, that taken from the number of gill-rakers, and distinguishes the following forms as new:—

Coregonus macrophthalmus, sp. n., p. 164, fig., Bodensee. 3 varieties: *steckbornensis*, p. 208, *zurichensis*, p. 209, *zugensis*, p. 211.

C. sulzeri, sp. n., p. 253, fig., Pfäffikonersee; *C. steindachneri*, sp. n., p. 279, fig., Traunsee.

Clupeidæ.

J. L. Wortman gives extracts from the MSS. of the late G. P. Dunbar on the habits of *Litholepis spatula*, Lac., and *Megalops thrissoides*, Bl., in the Southern United States; Am. Nat. xvi. pp. 381–389.

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Stolephorus opercularis, p. 275, Punta San Felipe, W. Mexico, *ischanus*, p. 340, *lucidus*, p. 341, *exiguus*, p. 342, *curtus*, p. 343, and *miarchus*, p. 344, Mazatlan, spp. nn., *iid. l. c.*

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Alepocephalidæ.

Alepocephalus agassizi, sp. n., Goode & Bean, Bull. Mus. C. Z. x. p. 218, Atlantic, 38° N. lat., 73° W. long., 922 fath.

Gymnotidæ.

Sternarchus albifrons (L.), p. 13, pl. v. fig. 6, and *brasiliensis*, Reinh., p. 14, pl. v. fig. 5: additional notes and figures; Steindachner, Denk. Ak. Wien, xliv.

Sternarchus macrolepis, p. 14, pl. v. fig. 7, and *muelleri*, p. 15, pl. v. fig. 1, *id. l. c.*, Amazons.

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Nettastoma procerum, sp. n., Goode & Bean, Bull. Mus. C. Z. x. p. 224, Atlantic, 33–40° N. lat., 76° W. long., 178–647 fath.

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Letharchus, g. n., distinguished from *Sphagebranchus* in lacking an

anal fin, the nostrils not being tubular, and the gill-openings being almost horizontal; Goode & Bean, *l. c.* p. 436. *L. velifer*, sp. n., *iid. l. c.* p. 437. Florida.

Ophichthys xysturus, p. 346, and *zophochir*, p. 347, spp. nn., Jordan & Gilbert, P. U. S. Nat. Mus. iv., Mazatlan.

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BY

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[Weinkauf, H. C.] Genus *Litorina*, l. c. pt. 315, pp. 41–72, pls. vi–xi., and pt. 318, pp. 73–114, pls. xii.–xiv.

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Wilcock, J. Yorkshire localities for *Sphærium* and *Pisidium*. J. of Conch. iii. pp. 327 & 328.

Wood-Mason, J. On the structure of the Foot in certain terrestrial *Gasteropoda*. P. A. S. B. 1882, pp. 60–62.

Conchological Journals.

Journal de Conchyliologie par M. Crosse & P. Fischer, vol. xxx. or (3) xxii., 1882, 354 pp. 14 pls.

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Procès-verbaux de la Société malacologique de Belgique, xi., 1882, 40 pp.

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Nachrichtsblatt der deutschen Malakozoologischen Gesellschaft, redigirt von W. Kobelt, xiv. Jahrgang, 1882, 192 pp.

The Journal of Conchology, vol. iii., Nos. 9–12, January–October, 1882, 8vo, pp. 257–384. [Nos. 11 & 12, pp. 321–384, really published in March, 1883.]

Bullettino della Società malacologica Italiana, vol. viii. 1882, 384 pp. 9 pls.

W. H. Dall gives a very interesting general review of what has been accomplished in America towards a knowledge of the biology and geographical distribution of the Mollusks of that continent, and suggests how much remains to be done not only there but elsewhere, for a better understanding of the causes of many long-known facts—for instance, the [illegible] and sculpture of shells; he thinks that struggle for existence will not suffice to explain all, especially in marine *Mollusca*. Address before the Section of Biology, Americ. Assoc., Montreal meeting, 1882.—Abstract in Nachr. mal. Ges. 1882, pp. 145–149.

Paul Fischer continues his very valuable Manual of Conchology [*cf.* Zool. Rec. xviii. *Moll.* p. 10]; part 4 contains hints for collecting, and the Cephalopods; part 5 the Pteropods and Pulmonates. The arrangement of the text is somewhat like that in Woodward's Manual, but it is

much more copious, and illustrated with many woodcuts. The 23 plates of the Atlas are the same as in Woodward.

G. W. Tryon's "Structural and Systematic Conchology," vol. i., is a valuable text-book for general knowledge of the *Mollusca*, containing accounts of their external and anatomical organization, the structure of the shell, habits, economy, geographical and palæontological distribution, and practical hints for collecting shells and arranging collections.

Anatomy and Physiology.

1. *General Morphology.*

G. Cattaneo (*suprà*) opposes the theory of Perrier and Gegenbaur, that the original type of the *Mollusca* is composed of metameres or repetitions of the homologous parts in a linear series, as in the Articulates and Vertebrates, stating that no serious evidence for that presumption exists among existing or palæontological forms. The first plate contains schematic figures of the nervous system of several genera of *Mollusca*, compared with that of the *Arthropoda*, and figures of the development of the same. Abstract in Zool. Anz. 1882, pp. 682–684.

J. Brock has found that the homogeneous as well as the fibrillary connective tissue (Bindegewebe) in *Aplysia* and some other *Mollusca*, exhibits traces of large cells, and may therefore be formed originally by cells in the same manner as in the Vertebrates. Zool. Anz. 1882, pp. 579–581.

2. *Muscular System and Movement.*

J. Wood-Mason proposes the term "Peripodium" for the part of the foot of the terrestrial *Gastropoda*, called by German writers "Fusssaum"; it is marked off from the side of the body, and very frequently also from the muscular foot by a horizontal groove, and is invariably richly ciliated throughout. P. A. S. B. 1882, pp. 60 & 61.

Tables of the creeping velocity of 21 species of European land and fresh-water *Mollusca* by H. Simroth, in an official publication by the Realschule in Leipzig (title *suprà*).

3. *Digestion.*

Further researches on the digestion in various cuttlefishes, snails, bivalves, by C. Krukenberg. Untersuchungen des physiologis Instituts in Heidelberg, iv. pp. 402–417.

E. Bourquelet states, as the result of various experiments, th only the secretion of the salivary glands and pancreas, but also o liver, of the *Cephalopoda* acts on amylaceous substances, and changes them into sugar. Arch. Z. expér. x. pp. 384–421.

Vigelius's observations on the so-called pancreas of the *Cephalopoda* [see Zool. Rec. xviii. *Moll.* p. 12] are now published in a separate volume (title *suprà*).

C. F. W. Krukenberg gives some chemical notes on "helicorubin,"

pigments of the liver of *Helix pomatia*, in his "Vergleichend-siologische Studien," ii. pt. 2, pp. 63–69.

B. Haller describes the "sugar gland" and other appendages of the intestinal tract in *Chiton*. Arb. z. Inst. Wien, iv. pp. 340–362, pls. ii. iii. & iv.

4. *Respiration and Circulation.*

K. Mitsukuri's paper "On the Structure and significance of some aberrant forms of Lamellibranchiate gills" [see Zool. Rec. xviii. *Moll.* p. 12] are also published in Stud. Biol. Lab. Hopkins Univ. ii., No. 2, pp. 257–270, pl. xix.

J. Carrière denies the existence of a distinct system of water-vessels in the *Mollusca*, excretory ducts of glands, &c., having been considered as such. Biol. Centralbl. i. p. 677–683; and Arch. mikr. Anat. xxi. pp. 387–467, with 3 pls.; see also Arb. Inst. Würzb. v. pp. 84 & 85, and also the remarks of H. Griesbach, Biol. Centrabl. ii. pp. 305–309 & 573–577.

B. Landsberg states that neither in *Neritina fluviatilis* (L.) nor in *Turbo rugosus* (L.) is the heart perforated by the rectum, as surmised by former authors, but the heart is small and intimately connected with the renal organ, the rectum passing between both; only the pericardium is perforated by it in *Turbo*, but in *Fissurella* and *Haliotis* it goes really through the ventricle of the heart. Zool. Anz. 1882, pp. 661–662.

5. *Excretion and Secretion.*

For Sedgwick's & Heller's notes on the renal organ of *Chiton*, see in the special part.

P. Girod describes at length the inkbag of the Cephalopods, and comes to the conclusion that it is analogous to the anal gland of many Gastropods, and is less developed and more primitive in the *Octopodidæ* than in the ten-armed Cephalopods. Arch. Z. expér. x. pp. 1–100, pls. i.–v.—Abstract in J. R. Micr. Soc. (2) ii. pp. 487–489.

The byssal organ in Bivalves is the subject of an elaborate paper by J. Carrière. He states that it exists in a more or less developed state in most of them, being typically composed of a distinct gland, which opens into a semilunar gutter, and of the byssal cavity, which is longitudinally plaited; between its plaits, the lamellæ are formed, and constitute the threads of the byssus itself. This organ is well developed in the spinning Bivalves, such as the *Mytilidæ*, *Aviculidæ*, *Tridacna*, some species of *Pecten* and *Arca*; more or less rudimentary, but distinctly recognizable, in *Cardita*, *Astarte*, *Venus*, *Cardium*, *Cyclas*, *Tellina*, *Gastrochæna*, *Arca granosa*, *Pecten jacobæus*, &c.; it is very reduced in *Spondylus* and the *Unionidæ*, and completely wanted in *Pisidium* (adult stage). *Anomia*, *Hinnites*, and *Cyclas* are byssiferous only in their youth. The author describes and figures this organ specially in 28 species of Bivalves of different families. Arb. Inst. Würzb. v. pp. 56–92, pls. v. & vi.

6. *Nervous System.*

Notes on the structure of the nervous system in the *Mollusca*, by W. Vignal, C. R. xcv. pp. 249–251. Abstract in J. R. Micr. Soc. (2) ii. p. 603.

Nervous system of the *Muricidæ* described by B. Haller, Denkschr. Ak. Wien, xlv. pp. 87–106; and of *Chiton*, id. Arb. z. Inst. Wien, iv. pp. 324–340, pl. i. figs. 1–6, & pl. ii. figs. 8 & 9.

Description of the supra- and infra-pharyngeal ganglions and their commissures in 16 genera and 50 species of European land and fresh-water shells, by H. Simroth (*suprà*). Abstract in Arch. Z. expér. x. pp. xlix.-liv.

The histological elements of the nervous fibres in *Unio* are described by J. Chalin, C. R. xciv. pp. 1723–1726.

7. *Organs of Sense.*

The eye of *Spondylus* [*gæderopus* (L.)] is described by S. J. Hickson; it resembles generally that of *Pecten*, but is proved to be not so highly developed, by the shortness of the stalk, the position of the retina nearer the lens than the tapetum, and the slight development of a vitreous cavity. Q. J. Micr. Sci. (2) xxii. pp. 362–364, woodcut.

Otoliths of the *Mollusca* discussed by Minot, Journal of Otology (North America) 1881. [Not seen by the Recorder.]

H. Simroth thinks that the sense of smelling is distributed over the whole soft skin in land-snails, and especially concentrated near the respiratory orifice; he is confirmed in this view by finding a thick set of ganglion cells in the transverse furrow between the free front edge of the mantle and the body in *Parmacella olivieri* (Cuv.). Zool. Anz. 1882, pp. 472–475.

The distribution and termination of the nerves in the part of the mantle lining the interior of the shell within the pallial line and the adductor muscles in *Unio* and *Anodonta*, forming a plexus with very close meshes, and being probably a delicate feeling apparatus, is the subject of a paper by L. Vialleton, C. R. xcv. p. 461. Abstract in Ann. N. H. (5) x. p. 336.

8. *Embryology.*

Popular description of the outlines of development in several *Mollusca* by O. Taschenberg, Verwandlungen der Thiere, 1882, pp. 138–148, with 8 woodcuts.

M. A. Schulgin has observed that the fecundated egg of *Vermetus* becomes amœboid, and swallows up in this state other infecundated eggs; something similar is also observed in the eggs of *Nassa*. Zool. Anz. 1882, pp. 548–550. [Compare the observations of Koren & Danielssen, Fauna litt. Norvegiæ, ii. 1856, in *Buccinum undatum*, and *Purpura lapillus*.]

Notes on the development of the Cephalopods by M. Ussow, Arch. Biol. ii. pp. 553–635. Abstract in J. R. Micr. Soc. (2) ii. pp. 328–330.

Development of *Bithynia tentaculata* (L.), described by P. T. Sarasin, Arb. Inst. Würzb. vi. pp. 1–68, 1 pl.

A few observations on segmentation in the *Nudibranchiata*, and the existence of a velar groove in them, resembling that of the Pteropods and Heteropods, the first stages of development in *Janthina*, and the origin of the nervous system by proliferation from paired thickenings of the epiblast in *Purpura lapillus* and *Murex erinaceus*, by A. C. Haddon, Q. J. Micr. Sci. (2) xxii. pp. 367–370, pl. xxxi.

A. Kowalewsky makes some observations on the first stages of development in *Chiton polii* (Phil.), describing the formation of the intestine, the pedal gland, the nervous system and the shell, which makes its first appearance in the form of seven groups of highly coloured cells. Zool. Anz. 1882, pp. 307–310.

The first stages of development in the European Oyster are described by R. Horst, Q. J. Micr. Sci. (2) xxii. pp. 341–346, pl. xxvii. According to him, the shell-gland is flattened out, and passes into a saddle-shaped thickening of the epiblast, giving origin by its secretion to a thin cuticular membrane, the future shell. The bivalve shell is therefore at the beginning an unpaired formation, not developed from two separated valves, and afterwards united by the hinge. Also in Zool. Anz. 1882, pp. 160–162.

Notes on some of the early stages of development of *Mya arenaria* (L.), segmentation of the egg the same as in *Ostrea* and *Anodonta*; J. A. Ryder in Ferguson's Report on the Fisheries in Maryland, 1881, appendix 4, and Am. Nat. xvi. p. 911.

9. *The Shell generally.*

T. Tullberg (Sv. Ak. Handl. xix. No. 3) in an elaborate and very well illustrated treatise on the structure and growth of the shells of *Mytilus edulis*, *Modiola modiolus*, *Margaritana margaritifera*, *Ostrea edulis*, and *Buccinum undatum*, comes to the conclusion that the shell is for the greater part a separate product of the cells of the mantle, the formation of the substance being best compared with the same process in *Homarus vulgaris*, as in them also the outer parts of the cells are gradually changed into a shelly substance.

Folin states, from experiments made by means of the air-pump, that the whole shell of several land-snails, for instance *Cyclostoma elegans*, is permeable by air; in others only distinct parts (for instance, the umbilical region) are permeable; in some *Cyclostomatidæ* the operculum (*Aulopoma*) or peculiar sutural tubes seem to admit air into the interior of the shell; the truncation of *Rumina decollata*, and of many *Cyclostomatidæ* may also serve for the same purpose. Act. Soc. L. Bord. xxxiv. [1880]. Abstract in J. de Conch. xxx. p. 65.

A. Hyatt, in "Transformations of *Planorbis* at Steinheim, with Remarks on the effects of Gravity upon the forms of Shells and Animals," suggests that the influence of gravity, combined with heredity, must be

10. *Biology.*

Note on the duration of life in some *Mollusca*: *Vitrina* lives only 1 year; *Cyclas* and *Pisidium* 2, *Hyalina*, *Succinea*, *Limnæa*, *Planorbis*, and *Ancylus* are full-grown in 2–3 years; *Helix* and *Paludina* 2–4; *Pupa*, *Bulimus*, and *Clausilia* are full-grown in 2 years, but live probably longer as adult shells, and are much more plentiful than young ones; *Anodonta* in about 12–14. Clessin in Weissmann's Ueber die Dauer des Lebens, 1882, pp 79–81.

C. Ashford makes some very interesting observations on the hibernation of snails:—*Helix pomatia*, *nemoralis*, *aspersa*, and *arbustorum* hibernate completely, retiring once for all for the winter in England; *Vitrina pellucida*, *Helix fusca*, *sericea*, *caperata*, *hispida*, *pulchella*, *hortensis*, *rufescens*; *Zonites cellarius* and *alliarius*; *Cochlicopa lubrica* and *Bulimus acutus*, on the contrary, can be found moving and feeding in December, January, and February. The author observed the pulse of *Helix hortensis* and *Zonites cellarius* in hibernation during the three winter months, and found that its frequency decreased with the temperature, being 12–14 per minute at 42–44° Fahr., 9–11 at 37–38° Fahr., 4–8 at 26–33° Fahr.; at the lower temperatures, not only the contractions of the heart are reduced to few in number, but are also irregular, a full and deliberate contraction being followed by one, two, or three, of very small amplitude. The epiphragm of *Helix hortensis* was always opaque and papyraceous below or near freezing point, otherwise thin and pellucid; it was destroyed and renewed five times during the three months. *Zonites cellarius* formed no epiphragm, and a part of the body was outside the aperture during the whole of the three months. J. of Conch. iii. pp. 321–326.

Rouzaud has proved that land-snails not only absorb water by the surface of the foot, but also swallow a considerable quantity by the mouth; he thinks that the mucous cover of the body protects them against too much evaporation of water. C. R. Assoc. Franç., 9me sess. Reims, 1880 (Paris, 1881) pp. 713–715.

Jousseaume makes general remarks concerning the growth of shells and the character of the embryonal whorls in them; Le Nat. 1882, pp. 158, 159, 182, & 183.

Increase of number, size, and form of the teeth in the radula by age in *Hyalina cellaria* (Müll.), *draparnaldi* (Beck), and *glabra* (Stud.), stated by Sterki, Nachr. mal. Ges. 1882, pp. 172–178; and in several species of *Limax* by B. Esmark, N. Mag. Naturv. xxvii. pp. 92–96, figs. 3–5.

11. *Abnormities.*

R. P. Whitfield has observed that specimens of *Limnæa megasoma* (Say) propagated in confinement apparently without copulation, and that following generations, reared in confinement, were sterile; he has also proved, by dissection, that the hermaphroditical gland was wanting in the latter. Bull. Am. Mus. Nat. Hist. i. No. 2. pp. 29–37, pl. v.

Ten specimens of a *Vitrina* found in the Island St. Michael, Azores, proved by dissection to entirely want the reproductive organs; perhaps they may be hybrids. F. d'Arruda Furtado, Ann. N. H. (5) ix. pp. 397–399, with additional note by L. C. Miall, *tom. cit.* p. 399.

Dextral specimens observed in 6 species, and albino and pale varieties in a large number of species of *Clausilia* by Böttger, Nachr. mal. Ges. 1882, pp. 36–43.

Albinos of *Hyalina nitens* (Mich.), Riémenschneider & Böttger, Nachr. mal. Ges. 1882, pp. 124 & 125; of *Helix sericea* (Dr.), Merkel, *l. c.* p. 125; of *Helix fidelis* (Gray), Wetherby, J. Cincinn. Soc. iv. Oct. 1881; of *Realia*, von Möllendorff, JB. mal. Ges. ix. p. 356; of *Orthalicus*, Strebel, Mexik. Landschneck. v. pp. 9 & 10.

GEOGRAPHICAL DISTRIBUTION.

a. Land and Fresh-water Mollusca.

1. *Palæarctic Region generally.*

General remarks on the relations of land-snails to the quality of the soil, and instances of mimetic coloration, by H. Jordan, Biol. Centralbl. ii. pp. 208–223; he points out that several species which are in southern countries not confined to any particular quality of soil, are, in more northern latitudes, found only on limestone soil, which absorbs more warmth than others, for instance, *Helix strigella*, *rufescens*, and even *pomatia*; on the contrary, the few species which distinctly avoid limestone, as *Helix ruderata*, *holoserica*, and *Balea perversa*, are rather northern species, and prefer damp localities.

Several "circumboreal" species of fresh-water shells discussed by R. Stearns, P. Cal. Ac. Nov. 20, 1882.

[illegible]iatic Coast of Bering's Strait. Observations on its terrestrial and [illegible]water shells by the brothers A. & A. Krause, Nachr. mal. Ges. [illegible]p. 43 & 44.

[illegible]obelt begins a new series of the continuation of Rossmässler's [illegible]graphie," describing and figuring numerous species of *Daudebardia*, *Hyalina*, and *Helix*, recently described by various authors from Europe, Western Asia, and Northern Africa. Those which have not been figured before, will be mentioned in the special part of this Record.

2. *Scandinavia.*

Arctic regions of Norway. 25 terrestrial and 10 fresh-water species (6

of the latter belonging to *Limnæa*), mostly collected near Tromsö, by Schneider, with notes on the geological formation, enumerated by E. Esmark, in Tromsö Mus. Aarsh. v. p. 98–104.

Norway. Esmark gives lists of the land and fresh-water Mollusks found in several parts of Southern and Central Norway, chiefly on limestone and clay-slate soil, with several interesting notes on varieties and individual variations, &c.; N. Mag. Naturv. xxvii. pp. 77–110. 10 species of *Pisidium* observed from various localities, and 2 species of *Sphærium* enumerated; *id.* Mal. Bl. (2) v. pp. 1–6.

3. *British Fauna.*

Various localities of British land and fresh-water *Mollusca* mentioned, and specimens exhibited at the meetings of the Conchological Society at Leeds; J. of Conch. iii. pp. 282-286, 330–333, & 337–339. List of British Fresh-water shells, with localities, in the collection of the late R. MacAndrew, by A. H. Cooke, *l. c.* pp. 380–384.

Northern Scotland. Various land and fresh-water shells collected in Sutherland and Caithness by W. Baillie, J. of Conch. iii. pp. 297–299; *H. arbustorum* most common, often in company with *H. hortensis*; *H. ericetorum* only in one locality; *Unio margaritifer*, Naver, Brora, and Helmsdale rivers, &c.

Yorkshire. On various forms of *Anodonta*, *Unio*, and *Sphærium*, found in the Ouse and Foss, with relation to the quality and the current of the water; W. C. Hey, J. of Conch. iii. pp. 268–273. 47 species found at Birstwith, enumerated by F. T. Walker, *l. c.* pp. 275–277. 67 in the Lower Tees District by Charles Ashford, *l. c.* pp. 278–281. 32 fresh-water and 42 terrestrial species from the neighbourhood of Beverley, by J. D. Butterell, *l. c.* pp. 289–296. 4 species of *Sphærium* with 1 variety, and 4 of *Pisidium* with 3 varieties, enumerated by J. Wilcock, *l. c.* pp. 327 & 328. Molluscan fauna of Somerdale, W. D. Roebuck, Yorksh. Nat. viii. pp. 52–55.

Bristol. 107 species and 70 varieties enumerated by J. W. Cundall, J. of Conch. iii. pp. 260–267.

Western Sussex, west of the River Arun. 30 fresh-water and 49 terrestrial species, including *Helix obvoluta*, enumerated by W. Jeffery, J. of Conch. iii. pp. 305–317. Twenty-five books or papers bearing on the land and fresh-water *Mollusca* of Sussex, the first dating 1840, enumerated by W. D. Roebuck, *l. c.* pp. 318–320.

4. *Germany.*

North-Western Germany. F. Borcherding gives lists of land and fresh-water *Mollusca* found in various parts of Hanover, Oldenburg, Westphalia, and Eastern Friesland; Mal. Bl. (2) v. pp. 83–109.

Lübeck. 51 terrestrial and 46 fresh-water species enumerated by C. Arnold, Arch. Ver. Mecklenb. xxxvi. pp. 1–13.

Danzig. E. Schumann gives several additions and corrections to his

former list of land and fresh-water shells [see Zool. Rec. xviii. *Moll.* p. 21]; Schr. Ges. Danz. (2) v. pt. 4.

Mark Brandenburg. List of 65 species of fresh-water shells by O. Reinhardt in: Amtliche Berichte über die internationale Fischereiausstellung (published 1881) iv. pp. 20–22.

Silesia. *Helix transsylvanica* (Ziegl.), = *fusca* (Bielz), *Planorbis corticulus* (Troschel), *Bythinella scholzii* (A. Schm.), and *Vitrina elongata* (Drap.), and others, observed by E. Merkel, Nachr. mal. Ges. 1882, pp. 64–67 & 125.

Moravia. List of land and fresh-water *Mollusca* by J. Ulicny, in Annual Report of the Gymnasium in Brünn (title *suprà*).

Eichsfeld. Additions to a former list [Zool. Rec. xvi. *Moll.* p. 22, xvii. p. 20], and numerical relations of some species of *Clausilia*; Böttger, Nachr. mal. Ges. 1882, p. 150.

Zierenberg, near *Cassel.* 38 species of terrestrial shells observed, including *Azeca menkeana* (Pfr.), *Cyclostoma elegans* (Müll.), and *Acme polita* (Hartm.); this valley is especially favourable to land-shells, numerous spots of exposed limestone being scattered in it. Diemar, Nachr. mal. Ges. 1882, pp. 11–18.

Mount Taurus. Several terrestrial species observed on the green hornblend-slates, including a rather large number of albino specimens, by Kinkelin, Nachr. mal. Ges. 1882, pp. 7–11. *Helix personata*, Heusler, *l. c.* pp. 101 & 102.

Frankfort. G. Servain, Hist. d. Moll. Aceph. de Francfort, following the steps of Bourguignat in the minute distinction of species, enumerates 6 species of *Sphærium*, 4 *Pisidium*, 15 *Unio*, and 26 *Anodonta*, and described 12 of them as new. Notes on some rare species observed by O. Goldfuss, Nachr. mal. Ges. 1882, pp. 81–86.

5. *France.*

A. Locard, Catal. gen. moll. viv. de la France, gives a fresh enumeration of all land and fresh-water species hitherto observed in France, including many new or little known supposed species distinguished by Bourguignat and his followers, with full synonymy and localities. Descriptions of new and lately established species are given in an Appendix; these will be indicated *infrà*, the original works not being easily accessible.

The same author publishes Parts iii.–v. of his "Contributions à la f[illegible]e malacologique française," containing a monograph of the genus [illegible]*tia*, observations on the distribution of *Helix nemoralis*, *hortensis*, [illegible]*ratica*, and notes on some southern species recently found in the [illegible]s of Lyons. Abstract in J. de Conch. xxx. pp. 318–320.

[illegible]*rence.* Several local lists with some new species by Coutagne, Note sur la faune malacologique du bassin du Rhone, i. [1881].

Bonzac. Fresh-water shells; E. Benoist, Act. Soc. Linn. Bord. xxxv. P. v. p. xxxii.

Pyrenees. Two papers by P. Fagot, on the species allied to *Helix arbustorum* and *Pupa pyrenaica* (infrà), have not been seen by the Recorder.

6. *Alps.*

Mittenwald, Bavarian Alps. Notes on its malacological fauna by E. v. MARTENS, Nachr. mal. Ges. 1882, pp. 113–118.

Styria. Occurrence of some rather rare species and varieties of *Clausilia*, by H. TSCHAPECK, Nachr. mal. Ges. 1882, pp. 20–25.

Ahrenthal, Tirol. 12 species added to those before enumerated; CLESSIN, Mal. Bl. (2) v. p. 152.

Toblach, Bozen, and *Arco*, in S. Tirol. 33 terrestrial and 2 aquatic species enumerated by BÖTTGER, Nachr. mal. Ges. 1882, pp. 18–20.

Valfondo, Ampezzo, Tirol. Occurrence of *Clausilia funki, gredleriana*, and *letochana*, and list of other land-shells; V. GREDLER, Nachr. mal. Ges. 1882, pp. 131–135.

Lago di Toblino, S. Tirol. A few notes on its fresh-water shells by P. PAVESI, Atti Soc. Ital. xxv. p. 143.

Provincia di Como. 22 species of land snails and 8 fresh-water species observed near and in the small lake of Piano, between Menaggio and Porlezza, are enumerated by E. BONARDI, Boll. scient. No. 4, Dec. 1882, 8vo. Nearly the same and some others found in Vall' Intelvi, and between Lakes Como and Lugano; *id.* Atti Soc. Ital. xxv. pp. 147–162.

7. *Spain.*

Malacological excursions in the environs of Barcelona, Tarragona, Valencia, and Cartagena, Gibraltar, Algesiras, Tarifa, Malaga, Ronda, and Granada, described by W. Kobelt, JB. mal. Ges. ix. pp. 73–90 & 143–170.

Jaen, in Andalusia. New species of *Patula* and *Pupa*; Clessin, Mal. Bl. (2) v. pp. 187 & 188, pl. iv. figs. 3 & 4.

8. *Italy.*

The *Limacidæ* of Italy and their geographical distribution form the subject of a very interesting paper by M. LESSONA and C. POLLONERA. *Arion rufus* occurs south of the Alps only by acclimatation, and the genus *Arion* is wanting in the islands of Italy. More than a dozen species are peculiar to Italy, most of them living in Northern Italy or in the Apennines, others in Sicily. *Amalia gagates* is generally distributed on the shores of the Mediterranean. Mem. Acc. Tor. (2) xxxv. 73 pp., [illegible] s., and several woodcuts.

Province of Rome. 96 terrestrial and 55 fresh-water species w[illegible] synonymy enumerated by A. STATUTI, Bull. Soc. mal. Ital. viii. pp[illegible]

Brindisi. 12 species of land-snails enumerated by HESSE, J[illegible] Ges. ix. pp. 284 & 285.

Sardinia. MME. PAULUCCI gives a very elaborate and valuable account of the land and fresh-water shells, chiefly from collections made by Caroti in 1879, containing 86 terrestrial and 41 fresh-water species, including several new, with critical notes on some of them and allied Italian species; 31 species appear to be peculiar to Sardinia, many are

found also in Corsica, a large number are generally distributed over Southern Europe; among the most remarkable new species are to be mentioned *Helix carotii*, allied to *H. raspailii* (Payn), from Corsica, and *H. gennarii*. Bull. Soc. mal. Ital. viii. pp. 139–381, pls. i.–ix.

Sicily. L. Benoit has published a new catalogue of the land and fresh-water *Mollusca*, containing 266 species (title *suprà*).

9. *South-east Europe.*

Carniolia, Istria, and *Dalmatia.* Localities of some minute shells, Böttger, Nachr. mal. Ges. 1882, pp. 178–180.

Hungary. 5 species and 10 varieties of *Succinea* found near Buda-Pesth enumerated by J. Fitzgerald, J. of Conch. iii. p. 274.

Servia. H. Drouet, "Unionidæ de la Serbie," describes 13 species of *Unio* and 11 of *Anodonta* living in the Danube, Save, Drina, &c.; 13 of them are widely distributed in Europe, the rest either confined to Servia, or only found hitherto in neighbouring countries, such as Bosnia and Carniolia.

Greece (Attica, the Islands of Syra, Tinos, Zante, and Corfu). Descriptions of malacological excursions and lists of 71 terrestrial and 8 fresh-water species by P. Hesse, JB. mal. Ges. ix. pp. 283–336. New slugs by Hesse and Böttger, Nachr. mal. Ges. 1882, pp. 96–101.

10. *Africa.*

S. Thomé Island, W. Africa. 17 species of terrestrial species, including several new, by R. Greeff, Zool. Anz. 1882, pp. 516–521.

Angola and *Loango Coast.* 17 terrestrial and 9 fresh-water species collected by von Mechow and Buchner, including some new species, enumerated by E. v. Martens, JB. mal. Ges. ix. pp. 243–250. They show all the general character of Tropical African species, with no perceptible approach to special South African forms.

Somali-land. 33 terrestrial species and 4 aquatic, including *Melania tuberculata*, collected by G. Revoil, described and most of them figured by J. R. Bourguignat in Revoil's Faune et Flore des pays Çomalis, Moll., 108 pp. 4 pls. The genus *Helix* is represented by 5 species of the group of *H. pisana*; *Limicolaria* by some relatively small species; several species of *Bulimus*, group *Petræus*, and a number of *Cyclostomatidæ*, allied to *Otopoma* and *Lithidion*, for which the author proposes 3 new [illegible], are the most prominent figures. The allied Socotran and South [illegible]n species are also critically reviewed.

[illegible]e notes also concerning the same collection by C. F. Ancey, Nat. [illegible]i. No. 9, 1882. [Not seen by the Recorder.]

Socotra. Report on land-shells by H. H. Godwin-Austen in Rep. Brit. Assoc., 51 meeting, pp. 196 & 197 [*cf.* Zool. Rec. xviii. *Moll.* p. 23].

Eastern Africa. Notes on some slugs by Heynemann, Nachr. mal. Ges. 1882, pp. 180–184.

Lake-region. Note on *Paramelania* by E. A. Smith, Nature, xxv. p. 318.

Mayotte Island, Comores. 16 terrestrial, 5 fresh-water, and 7 brackish water species (many new), enumerated and described by A. Morelet, J. de Conch. xxx. pp. 185–200, pl. x.

Madagascar. 5 species operculated, 10 inoperculated land shells, 11 fresh-water Gastropods, and 4 fresh-water Bivalves, collected partly by W. Johnson in the environs of Antananarivo and in the north-western part of the island, and by W. D. Cowan [and M. Hildebrandt] in a more southern part of the island near Betsileo, enumerated and most of them described by E. A. Smith; 17 species are new. *Helix barrakporensis* (Pfr.) is also found in India, *Limosina ferruginea* (Krauss) in Southern Africa. All others are confined to Madagascar. P. Z. S. 1882, pp. 375–389, pls. xxi. & xxii. 10 terrestrial and 2 fresh-water species collected at Marovare, Eastern Madagascar, by Audebert, including some new, enumerated and described by A. Mousson, J. de Conch. xxx. pp. 37–48, pl. iii. The known species of *Nanina*, 10, including 6 new, by H. Dohrn, JB. mal. Ges. ix. pp. 370–377. 2 new species by Crosse & Fischer, J. de Conch. xxx. pp. 324 & 325.

Mauritius. Description of some new species, and critical notes concerning the occurrence, specific distinctness, and nomenclature of others, by A. Morelet, J. de Conch. xxx. pp. 85–106, pl. iv.

11. *Central and Eastern Asia.*

Hasrat Sultan Mountains, S.E. of Samarcand. 11 species of land-shells collected by Haberhauer, enumerated by H. Dohrn, JB. mal. Ges. ix. pp. 115–120. Besides some already known from Turkistan by the collections of the late P. A. Fedtschenko, there are some already known from Northern Syria and Hindostan, and 1 new *Zonites*.

Central Asia. 24 land and 17 fresh-water shells, collected by A. Regel, N. M. Przewalski, and Potanin, on both slopes of the Tianshan Mountains and in Eastern Mongolia, 3 collected by Richthofen in the Löss of China, and some new additions to the fauna of Turkistan and Khiva are enumerated and described by E. v. Martens in Mém. Ac. Petersb. xxx., No. 11, 65 pp. 5 pls. Varieties of *Limnæa stagnalis* and *auricularia* from the River Tarim, and *L. plicatula* (Benson), var. n., from Lake Kukunor, may be mentioned here. The species not before figured will be mentioned in the special part. A list of all known land and fresh-water shells of Central Asia, from the Altai to Ladak, and Kokand to the confines of China proper, is given, pp. 49 & 50, with special analytic tables of the species of *Helix*, pp. 19 & 20, and of *Buliminus*, p. 27. General[illegible] Molluscan fauna of Central Asia is rich in *Helix* belonging or near[illegible] group *Fruticicola*, in *Buliminus*, *Succinea*, and *Limnæa*; it agrees i[illegible] and other features with the general palæarctic fauna, chiefly the northern circumpolar part of it, and wants a number of genera characteristic of South Europe, and especially the genus *Clausilia*.

Preliminary notes on a collection made by A. Kuschakewitz in the mountainous regions from the Lakes Alakul and Issikul to the Pamir table-land, with some new species, by E. v. Martens, SB. nat. Fr. 1882, pp. 103–107.

Central China. New land shells from Inkiapo in the southern Tsin-ling, and from the province Se-chuan, by ANCEY, Le Nat. iv. No. 6, pp. 44 & 45, and No. 8, pp. 59 & 60, and by BÖTTGER, Nachr. mal. Ges. 1882, p. 69.

Middle China. P. M. HEUDE (title above) describes and figures a large number of terrestrial shells collected in the valley of the Yangtsekiang, in the Chinese provinces Hupe, Hunan, Kiangsi, Nganhwe, and Kiangsu, many of which are new species. The localities appear to be given very accurately, and the figures drawn in China by no special artist are recognizable and very meritorious, so that this paper is a very valuable contribution to Chinese malacology. The new species will be mentioned *infrà*.

Abstract and critical notes on the same by Crosse ; J. de Conch. xxx. pp. 134–137.

V. GREDLER enumerates the hitherto known land and fresh-water shells of China, 141 terrestrial and 27 fresh-water, a few of them new ; Mal. Bl. (2) v. pp. 165–187. He also gives some additions to a former paper on the snails of the province Hunan, and a list of 9 species collected by P. Zeno Möltner near Sinanfu, province Shantung ; JB. mal. Ges. ix. 38–50. The same new species are described in both papers.

O. v. MÖLLENDORFF reviews the known operculated land shells of China, 32 species, with critical notes ; JB. mal. Ges. ix. pp. 251–278 & 337–356.

List of fresh-water shells found near Ningpo by A. FAUVEL, Mém. Soc. Cherbourg (2) xxiii. [1881] pp. 179–181 & 197.

Province Quantung, Futsan, Hainan and *Macao.* Several new land shells, including some very peculiar, described by O. v. MÖLLENDORFF, JB. mal. Ges. ix. pp. 179–188.

Hongkong. 33 species of land shells enumerated by Eastlake, P. Ac. Philad. 1882, pp. 231–236.

Japan. 23 species of *Clausilia* collected by R. HUNGERFORD in Japan, among which are 12 new, by O. v. MÖLLENDORFF, J. A. S. B. li. pt. 2, pp. 1–13, pl. i. figs. 1–10.

12. *India.*

British India. H. H. GODWIN-AUSTEN begins a new work on the Land and Fresh-water *Mollusca* of India including South Arabia, the Malay Peninsula and some islands of the Indian Ocean, supplementary to Theobald & Hanley's "Conchologia Indica." The two first parts published in July, 1882, treat the genera *Kaliella, Microcystina, Cryptosoma, Sagdinella, Anadenus,* and *Hya[lo]limax.* He also publishes some [illegible] of living specimens of *Nanina,* drawn by the late F. Stoliczka, J. A. S. B. li. pt. 2, pp. 68–72, pl. v.

13. *Australia.*

New Caledonia. Review of the known species of *Helix* and allied forms, by an anonymous author in Le Nat., 1882, pp. 85–87.

Continent of Australia. E. A. SMITH gives a very valuable paper on

the fresh-water shells of Australia, enumerating all known species with critical remarks, and describing and figuring many new ones. It contains 11 species of *Melania*, 9 *Vivipara*, 1 *Larina*, 4 *Bithynia*, 1 *Gabbia*, 1 *Paludinella*, 1 *Amnicola*, 1 *Tatea*, 6 *Hydrobia*, 11 *Limnæa*, 52 *Physa*, 1 *Physopsis*, 6 *Planorbis*, 2 *Segmentina*, 1 *Ancylus*, 11 *Neritina*, 1 *Navicella*, 8 *Corbicula*, 4 *Spharium*, 3 *Pisidium*, 17 *Unio*, and 1 *Mycetopus*; finally 14 pseudo-Australian species are mentioned. J. L. S. xvi. pp. 255–317, pls. v.–vii.

R. TATE also enumerates the Australian fresh-water shells, viz., 16 species of *Limnæa*, 54 *Physa*, 1 *Physopsis*, 1 *Ancylus*, 1 *Gundlachia*, 7 *Planorbis*, 7 *Melania*, 10 *Paludina*, 1 *Valvata*, 1 *Navicella*, 7 *Neritina*, 7 *Bithynia*, 4 *Amnicola*, 2 *Bithynella*, 2 *Hydrobia*, 1 *Paludinella*, 1 *Tatea*, 2 *Pomatiopsis*, 2 *Assiminea*, 3 *Spharium*, 3 *Pisidium*, 9 *Corbicula*, 1 *Batissa*, 10 *Cyrena*, 1 *Mycetopus*, 18 *Unio*, 2 *Alasmodon*; P. Linn. Soc. N. S. W. vi. pp. 552–569. Note on some species of *Melania*, *Paludina*, *Physa*, *Unio*, *Alasmodon*, and *Corbicula* from New South Wales, by J. BRAZIER, *op. cit.* vii. pp. 83–86.

New Zealand. Anatomical notes concerning some land snails, systematic ones concerning the *Hydrobiidæ* and fresh-water Bivalves, by F. W. HUTTON, Tr. N. Z. Inst. xiv. pp. 143–160, pls. i.–v. 18 species of fresh-water *Mollusca*, genera *Aplexa*, *Planorbis*, *Latia*, *Melanopsis*, *Hydrobia* [*Potamopyrgus*], *Pisidium*, and *Unio*, enumerated by the same, P. Linn. Soc. N. S. W. vii. pp. 67 & 68.

Campbell Island. 1 new species of *Helix*, FILHOL, Bull. Soc. Philom. 1880.

14. *North America.*

A. G. WETHERBY continues his observations on the geographical distribution of North American fresh-water shells [see Zool. Rec. xvii. *Moll.* p. 27], distinguishing the following peculiar faunas:—

(A) The more northern circumboreal rather lacustrine fauna, represented chiefly by species of *Limnæa*, *Physa*, *Planorbis*, and *Anodonta*.

(B) Some species of *Unio* and *Anodonta* spread from Maine to the boundaries of Mexico, and from New York to Minnesota.

(C) The *Strepomatidæ* (North American *Melaniidæ*) peculiar to rapid stony rivers, plentiful in the east and very limited west of the Mississippi.

(D) The Ohio types of *Unio*, between the Ohio and Tennessee, the Appalachian mountains and the Mississippi.

Generally, the fauna of hilly regions are rather peculiar, the species them having a more limited geographical distribution, because variety of external physical conditions is greater in them than plains, and renders the natural selection in the adaptation to different localities more powerful. J. Cincinn. Soc., Oct. and Dec. 1881; also in Am. J. Sci. (2) xxiii. pp. 203–212. [The same can be said also concerning other parts of the world.—REC.]

Note on Wetherby's paper by R. ELLSWORTH CALL, Am. Nat. xvi. pp. 400–402.

R. STEARNS gives some interesting notes on the distribution of *Ano-*

[redacted]nd some other fresh-water shells in space and time within Western [redacted]orth America; P. Cal. Ac., Nov. 20, 1882.

Montana, Dakota, and *Minnesota.* Note on land shells collected by A. Krause, with some new varieties; E. v. MARTENS, SB. nat. Fr. 1882, pp. 138–141.

Fremont County, Iowa. List of 30 fresh-water shells, mostly *Unionidæ*, and 10 land shells, by R. E. CALL in his "History of Fremont County," 1880. The Nishnabotna River, in South-west Iowa, is the most western locality of *Unio pressus* (Lea); *id.* Am. Nat. xv. p. 392.

Saltville in *Virginia.* Univalves and bivalves collected by H. C. Lewis, identical with those of Houston River; LESLEY, P. Am. Phil. Soc. xix. p. 155.

Roan Mountains, North Carolina. Land shells by A. G. WETHERBY, J. Cincinn. Soc. iv., Dec. 1881.

15. *West Indies and Central America.*

St. Vincent. 14 inoperculate, including *Bulimus oblongus* (Müll.), and 2 operculated species of terrestrial *Mollusca* enumerated by LECHMERE GUPPY, P. Sc. Ass. Trinid. xii. 1881–82. The names also in J. de Conch. xxx. p. 302.

Mexico. H. STREBEL (title see above) concludes his valuable work on the Mexican terrestrial *Mollusca* by a fifth part, which treats of *Orthalicus, Bulimulus, Opeas, Spiraxis, Subulina,* with some new allied genera and finally *Vaginulus*; also in this part a number of anatomical descriptions of Mexican, or else American, species are given by G. PFEFFER.

16. *South America.*

New Granada. Some terrestrial species by DUNKER, JB. mal. Ges. ix. pp. 377–380.

Para, Brazil. Several land shells described by H. DOHRN, JB. mal. Ges. ix. pp. 97–114.

Province Rio Grande do Sul. Some new fresh-water species from Taguara del mundo novo, collected by V. Ihering, described by CLESSIN, Mal. Bl. (2) v. pp. 188–191, pl. iv. figs. 5–7.

b. MARINE MOLLUSCA.

1. *Arctic Seas.*

[redacted]FRIELE discusses 34 species and some varieties of *Buccinidæ*, col-[redacted]d during the Norwegian Expedition to the Arctic Seas in 1876–78, between Arctic Norway, Iceland, Jan Mayen, and Spitzbergen, and gives very valuable information concerning their occurrence, variability, dentition, ovicapsules, and embryonal shells; Norske Nordhavs Expedition, Zoologi, i., *Buccinidæ*, 38 pp. 6 pls.

40 species of *Gastropoda*, 2 *Solenoconchæ*, 2 *Pteropoda*, and 1 Cephalopod, none new, collected during the cruises of the Dutch vessel 'Willem

Barents' in the Arctic Sea between Spitzbergen and Novaya Zem[illegible] enumerated by T. W. VAN LIDTH DE JEUDE, Niederl. Arch. Zool., Suppl[illegible] pt. 3.

Varanger Fjord. Notes by POUCHET & DE GUERNE, C. R. xcv[illegible] pp. 1230–1232.

F. SCHNEIDER's paper on the *Mollusca* of Kvainangs Fjord in Tromsö Mus Aarsh. iv. 1881, has not been seen by the Recorder.

2. *Seas of Northern Europe.*

List of British marine shells, with localities, in the collection of the late R. MacAndrew by A. H. COOKE, J. of Conch. iii. pp. 340–379. A few marine shells from Weston-super-Mare, Clevedon, and Burnham, mentioned by CUNDALL, *l. c.* p. 267.

Belgian Coast. P. PELSENEER enumerates 3 species of Cephalopods, 5 Gastropods, and 30 Bivalves, the most common designedly not included; *Sepia rupellaria* (Orb.), *Kellia suborbicularis* (Mont.), *Saxicava arctica* (L.), and *Gastrochæna modiolina* (Lam.), are new for the fauna; Bull. Soc. mal. Belg. xvi.

Baltic, Inlet of Travemünde. 17 species of Bivalves, 24 of Gastropods, and 1 Cephalopod enumerated by C. ARNOLD, Arch. Ver. Mecklenb. xxxvi. pp. 14–16. Dars in Pomerania; some marine species enumerated by E. FRIEDEL, Nachr. mal. Ges. 1882, p. 87.

3. *Seas of Southern Europe.*

J. GWYN JEFFREYS enumerates the *Dentaliidæ*, *Chitonidæ*, *Patellidæ*, *Fissurellidæ*, and *Calyptræidæ* procured in the Atlantic and part of the Mediterranean during the expeditions of the 'Lightning' and 'Porcupine,' 1868–70, and gives several valuable additions to his former lists of the shells from those expeditions, published in 1878–81; P. Z. S. 1882, pp. 656–687, pls. xlix. & l.

Atlantic Shores of South West Europe. Rare or new species dredged during the French Expedition of 'Le Travailleur' in depths of 400–3307 mètres, by P. FISCHER, "Rapport sur la faune sous-marine," pp. 42–44, and in J. de Conch. xxx. pp. 49–53, 273–276 & 313.

Deep Sea Zone of the Mediterranean. P. FISCHER reports on the results of the dredgings of the French steamer 'Le Travailleur' in depths from 550–2660 mètres, partly near the South coast of France, partly bet[illegible] Oran and Gibraltar. 120 species have been collected there, but only [illegible] 30 of them can be regarded as abyssal; among them are several [illegible] have been hitherto only known as pliocene fossils, as, for exampl[illegible] *phon multilamellatus*, *Pleurotoma loprestiana*, *Columbella costulata*, [illegible] *subsoluta*, *Turbo rumettensis*, *Trochus gemmulatus* and *suturalis*, *Limopsis aurita* and *minuta*, *Leda messaniensis*, and some others hitherto only known from the Atlantic as *Pholadomya loveni* and *Modiola lutea*. The deep sea zone, with constant temperature of 55° F., extends in those parts of the Mediterranean from 250–3624 mètres; the deep sea species of the Mediterranean are also found in the Atlantic, but the arctic forms

[redacted]are fossilized in the glacial deposits of Sweden and the British isles appear no longer to exist as living in the Mediterranean, although they were abundant there during the newer pliocene period (deposits of Ficarazzi). Alphonse Milne-Edwards, "Rapport de la Commission pour la Faune sousmarine," pp. 18 & 19; also in C. R. xcv. pp. 1201–1203; J. de Conch. xxx. pp. 246 & 247, new species, pp. 49–53 & 273–276; Ann. N. H. (5) ix. pp. 37–41 & 477–479, and Le Nat. 1882, p. 121.

J. G. Jeffreys enumerates 36 species dredged near the Western Coasts of Italy and Sicily, in depths of 32–1970 fath., by the Italian surveying ship 'Washington' in 1881, some of which were only known hitherto as pliocene fossils; Ann. N. H. (5) x. pp. 25–37.

E. H. Giglioli gives preliminary notes on the same subject, with peculiar regard to the Cephalopods and Pteropods, in the Report of the third International Geographical Congress, and in Ann. Sci. Nat. (6) xiii. Art. 9.

J. G. Hidalgo continues his work on the marine *Mollusca* of Spain, figuring in the 17th part species of the genera *Pecten*, *Cardium*, *Chama*, *Saxicava*, *Clavagella*, *Pholas*, and *Tapes*.

E. Bucquoy & P. Dautzenberg begin a treatise on the sea shells of Roussillon, South coast of France, the first fascicle treating of the *Muricidæ*, including *Tritonium* and *Cancellaria*; the second of the *Buccinidæ*, including *Cassis* and *Columbella*, all illustrated by photographical figures; Moll. mar. de Roussillon. pts. i. & ii. pls. i.–v. & vi.–x.

List of shells found in the Department of Hérault by A. Granger, first part, Bull. Soc. Beziers, 1879. [Not seen by the Recorder.]

Adriatic. Notes on Stalio's statistical lists of Adriatic *Mollusca* by L. Pegorari, Atti Soc. Ven. Trent. vii. pp. 300–317.

Black Sea. J. Gwyn Jeffreys mentions 6 species (1 new) of *Mollusca* dredged by Admiral Spratt in 1856; Ann. N. H. (5) x. pp. 425–427. Some marine species collected by Retowski, enumerated by Weinkauff; Nachr. mal. Ges. 1882, pp. 70 & 71. A few general remarks concerning its fauna by E. v. Martens; SB. nat. Fr. 1882, pp. 151 & 152.

4. *East Coast of North America.*

New England, *Nova Scotia*, and *New Brunswick.* A. E. Verrill gives a very valuable paper on 255 species and varieties of marine *Mollusca* not described in the second edition of Gould's "Invertebrata of Massachusetts," [redacted] many are due to the dredging expeditions of the 'Fish Hawk' [redacted] deeper waters off the southern coast of New England. A large [redacted]r of them occur also on the coasts of Norway and England, and [redacted]others are nearly allied to species of the Mediterranean. The new species and those not before figured will be mentioned *infrà*; the figures are well executed. Tr. Conn. Ac. v. pp. 447–587, pls. xlii.–xliv., lvii. & lviii.

Provincetown, Cape Cod, Mass. 2 Cephalopods, 25 Gastropods, 23 Bivalves, enumerated by R. Rathbun, P. U. S. Nat. Mus. iii. [1880] pp. 116–133.

Southern Coast of New England. List of deep water *Mollusca* taken

off Martha's Vineyard in 1880–81, 9 Cephalopods, 63 Gastrop[illegible] Pteropod, and 24 Bivalves; with several new species, by A. E. VERRILL, P. U. S. Nat. Mus. v. pp. 315–343. Two living species of *Capulus hungaricus* (L.), hitherto only known from Europe, have been found there in 69 & 458 fath. Result of dredgings in 1882, with some new species; *id.* Am. J. Sci. (3) xxiv. pp. 364–366. Surface dredging in Vineyard Sound, *l. c.* p. 371; abstract in Am. Nat. xvi. p. 56.

VERRILL continues his researches on the Cephalopods of the East Coast of North America; Tr. Conn. Ac. v. pp. 259–446, pls. xxvi.–lvi. List of species found on the coast of New England since 1870; *id. l. c.* p. 450; abstract in Am. Nat. xvi. p. 233.

5. *Tropical Atlantic.*

Species common to the African and American Coasts are found only among the littoral animals, the larvæ of which can be carried by currents to considerable distances, but not in depths from 35–100 fath., where North Atlantic and Mediterranean forms prevail; T. STUDER, Zool. Anz. 1882, p. 353.

West Africa. 25 species of marine *Mollusca* dredged on the West Coast of Africa between 10° N. and 6° S. lat. in 37–150 fath., 14 of which are also known from the Mediterranean, and 4 species from depths exceeding 100 fath.; *id. l. c.* pp. 335, 336, 351–355 & 522.

Loanda. Some general notes on sea shells by E. PECHUËL-LOESCHE, Nachr. mal. Ges. 1882, p. 185.

West Indies. The known and some new species of *Nucula* and *Leda* enumerated by LECHMERE GUPPY, P. Sc. Assoc. Trinidad, xii. 1881–82.

6. *Indian and Polynesian Seas.*

Red Sea. Several new species by C. JICKELI, JB. mal. Ges. pp. 367–370.

New Caledonia. 60 species of *Cypræidæ* enumerated by R. ROSSITER, P. Linn. Soc. N. S. W. vi. pp. 817–831.

7. *Northern Pacific.*

Japan. W. DUNKER has published a very valuable special work on the marine *Mollusca* of Japan (title above), enumerating all known species, describing and figuring many new or little known, and giving va[illegible] useful remarks concerning several others; the collections made in [illegible] by J. Rein, E. Satow, and D. Brauns have supplied valuable mate[illegible] this work. In some species distinct localities, and even Japanese [illegible] of the shells, are given; the species which are new, or not figured be[illegible], will be mentioned in the special part.

Some notes on the occurrence of marine *Mollusca* in the Bay of Yeddo and Sagami by DÖDERLEIN, Arch. f. Nat. xlix. pp. 103, 107, 110, 111 & 119; several tropical species are offered for sale at Enoshima, but do not live there, they come from the Bonin or Liukiu Islands, p. 108.

J. KEEP, "Common Sea Shells of California," 74 pp. and 16 pls., con-

[redacted]igures of 95 species (well executed, according to W. Dall). [Not [redacted]en by the Recorder.].

Acapulco, S. Salvador, and *Panama*. 55 species collected by A. Krause, enumerated by E. v. Martens, SB. nat. Fr. 1882, pp. 140 & 141; some are nearly or quite identical with West Indian, e.g., *Columbella cribraria*.

8. *Australian Seas.*

Ralph Tate enumerates the species of shells collected by Preiss in Western Australia [1838-42], and described by Menke in his "Molluscorum Novæ Hollandiæ Specimen," 1843, giving the original descriptions and the names now adopted; he remarks that this fauna is essentially Indian, and shows conclusively that the tropical forms of Molluscan life prevail as far south as Swan River. P. Linn. Soc. N. S. W. vi. pp. 387–408.

Abstract of J. E. Tenison Woods's paper on the littoral *Mollusca* of N.E. Australia, by the Recorder, in Nachr. mal. Ges. 1882, pp. 91–95.

[redacted]oreton Bay. List of 27 species of *Cypræa*; Brazier, P. Linn. Soc. [redacted]. S. W. v. pp. 496–502.

[redacted]Oysters of New South Wales; J. Cox, P. Linn. Soc. N. S. W. vii. pp. 122–134.

The known Australian *Octopodidæ* enumerated; *id. op. cit.* vi. pp. 773–789.

New Zealand. Several additions and corrections to Hutton's last catalogue of New Zealand *Mollusca*, from comparison of specimens in the British Museum, are given by J. Gillies, Tr. N. Z. Inst. xiv. pp. 169–171. Anatomical notes on several Cephalopods and marine Gastropods; F. W. Hutton, *l. c.* pp. 162–167, pls. vi. & vii.

Palæontology of Recent Mollusca.

16 marine species collected in the older alluvial strata at Greifswalde, 2 of which are no longer found alive in the Baltic, and 7 others do not now occur alive in the region; E. Friedel, Nachr. mal. Ges. 1882, pp. 87 & 88. *Cardium edule* (L.) in diluvial strata in Berlin; *id. l. c.* p. 89.

Diluvial land shells from the Kesslerloch, near Thayingen, Schaffhausen, all recent, including *Helix nemoralis* (L.); Sterki, Nachr. mal. Ges. 1882, pp. 67 & 68.

[redacted]*lix pulveratrix* and *pulveratricula*, spp. nn., Löss of the Chinese pro- [redacted]Kansu, and *H. orithyia* (Martens, 1879), Löss of the province [redacted]; Martens, Centr. As. Moll. pp. 16, 17, & 12, pl. ii. figs. 18, 19, [redacted]3.

[redacted]ent land and fresh-water shells in the Iowa Löss; R. E. Call, Am. Nat. xv. [1881] p. 585.

In the northern portion of the desert region of Western North America, once the bed of great tertiary and quaternary lakes, whose eastern rim was formed by the Wahsatch Mountains, and whose western limit was the Sierra Nevada, varieties of *Anodonta nuttalliana* (Lea) are found in a fossilized state, lying on the surface, hidden among boulder-shaped masses

of hardened sedimentary matter. In the Colorado region, [illegible] associated with *Tryonia protea*, *Amnicola longinqua*, *Physa humerosa*, a[illegible] a *Planorbis* (probably *ammon*), in the ancient lake bottom of the Carson region, with remains of *Elephas*, *Equus*, &c.; R. STEARNS, P. Cal. Ac. Nov. 20, 1882.

Mauritius. 4 new subfossil species of *Cyclostoma*; MORELET, J. de Conch. xxx. pp. 90–93, pl. iv. figs. 1–4.

Bulimus gunni (Sow.), found fossil in the Travertine of Kent's Group, Bass Strait; BRAZIER, P. Linn. Soc. N. S. W. vii. p. 121.

HISTORICAL REMAINS AND CHANGES.

A. LOCARD enumerates the shells found in deposits of the river Saône, from the end of the quaternary epoch down to the Gallo-Roman times; inundations appear to have been more frequent in those days than at present. *H. pomatia* makes its first appearance in them, *H. aspersa* is still wanting. Ann. Ac. Macon (2) iv. [1881]. Abstract in J. de Conch. xxx. p. 254.

A. LOCARD states that *Helix rubella* (Risso), *cemenelea* (Risso), *putoniana* (Mabille), *acosmeta* (Bourg.), *neglecta* (Drap.), *trepidula* (Servain), *cespitum* (Drap.), *martinica* (Mabille), *lauta* (Lowe), *lineata* (Olivi), *pisana* (Müll.), *trochoides* (Poir.), *acuta* (Müll.), *Ferussacia locardi* (Bourg.), *Pupa quinque-dentata* (Born.), *megachilus* (Cristofori), and *farinesii* (Desmoul.), known before only from the Mediterranean shores of France, have been found recently also in the environs of Lyons, and concludes that they have migrated thither like some plants, of which he gives also several instances. Ann. Soc. Linn. Lyon, xxix.; also in his Contributions à la Faune malac. Franç., pt. 4, 24 pp.

J. B. GASSIES states that in Guyenne *Helix pomatia* is slowly extending its distribution, and that *H. strigella* (Dr.), which during the quaternary period was very common, is now very rare. The author attributes these changes to the extirpation of wood, and thinks that from the same cause some other small species will finally become extinct. On the contrary, *Helix lactea*, *vermiculata*, *boghariensis*, and *Leucochroa candidissima* which were introduced by O. Debeaux fifteen years ago, now propagate themselves. Bull. Soc. Linn. Bord. 1880. Abstract in J. de Conch. xxx. p. 256.

Bithynia tentaculata (L.) extends its habitat in North America; BEAUCHAMP, Am. Nat. xvi. p. 244.

Limnæa stagnalis (L.) introduced intentionally in New Z[illegible] HUTTON, Tr. N. Z. Inst. xiv. p. 157.

USE BY MAN.

General remarks on eatable snails and bivalves, by H. JORDAN, Humboldt i., pp. 137–145.

Note on the breeding of *Helix pomatia* in some parts of Europe, by RUDOLPH HESSELL, Bull. U. S. Fish Comm. i. p. 265.

Mediterranean. List of 65 species of edible Mollusks of the Mediter-

ranean, with their popular names in various parts of Italy [by the Recorder], in Amtliche Berichte über die Fischerei-Ausstellung, 1881, iv. pp. 24–26.

List of 14 Chinese species of Gastropods and 10 of Bivalves used as food, with their Chinese names; Fauvel, Mém. Soc. Cherb. (2) xxiii. [1881] pp. 197 & 198.

A. Issel has published a manual of oyster- and mussel-breeding (title *suprà*), describing the natural history of oysters generally and the varieties living in the Mediterranean particularly, the physical conditions favourable for their life and propagation, the rational management of oyster-breeding, and its practice in Italy and other countries, with suggestions for its amelioration; the breeding of mussels in Europe is also described, and that of *Novaculina* and of *Arca granosa* in China mentioned. Abstract by Sexoner in Zool. Gart. xxiii. p. 86.

For European, North American, and Australian oysters, see also in the special Part, *Ostreidæ*.

Some popular names for *Mya arenaria* and *Venus mercenaria* in North America incidentally mentioned by W. Dall, Am. Nat. xvi. p. 882.

General notes on pearls and pearl fishery, and special account of those of *Margaritana margaritifera* in Saxony, by H. Nitsche (and S. Friedländer), in Amtliche Berichte über die Fischerei-Ausstellung in Berlin, 1881, pp. 75–90, and Nachr. mal. Ges. 1882, pp. 49–64.

Dipsus plicatus (Solander) = *Symphynota lhuysi* (Dalry). On its occurrence at Ningpo, and the introduction of pieces of tin into the mollusk in order to get them overlayed by nacre; also on the production of artificial pearls, by introduction of spherical foreign bodies, in the province of Chekiang. Fauvel, Mém. Soc. Cherb. (2) xxiii. [1881] pp. 164–169.

Note on ornaments made out of shells (*Spondylus* and *Tridacna*) from Fiji, Bougainville, and Solomon Islands, by E. P. Ramsay, P. Linn. Soc. N. S. W., Aug. 30, 1882.

Haliotis. Several species exported from California; Dall, Am. Nat. xvi. p. 965.

The black fluid of *Sepia sinensis* (Orb.) is not used in China like ink, because the colour becomes pale after some time; Fauvel, Mém. Soc. Cherb. (2) xxiii. [1881] p. 136.

Notes on prehistoric heaps of sea or fresh-water shells as kitchen-middens in North America, chiefly New England and the Middle States, by C. Abbott, in his work, "Primitive Industry," a special publication of the Peabody Academy of Science (Salem: 1881), pp. 437–451; in many instances, the specimens are larger and more solid than those now living on the same shore, and *Venus mercenaria* (L.) was formerly rather abundant north of Cape Cod, where it is now very scarce and local.

Notes on certain aboriginal shell mounds on the coast of New Brunswick and of New England, by S. F. Baird, P. U. S. Nat. Mus. iv. pp. 292–297.

"Kitchen trash deposits," with recent species of *Unio* and Gastropods, the former broken up to mix with the clay of pottery, at Saltville, in Virginia; Lesley, P. Am. Phil. Soc. xix. p. 155.

Indications of worked shells (*Lunatia heros*) in the New England shell-

[redacted]ILL makes some remarks upon R. Owen's paper on new and rare *Cephalopoda*; Am. J. Sci. (3) xxiii. pp. 72–75.

Note on cuttle-fish catching in China, by Fauvel, Mém. Soc. Cherb. (2) xxiii. [1881] pp. 132–135.

Octopodidæ.

The known genera and 16 Australian species (none new), enumerated by J. Cox, P. Linn. Soc. N. S. W. vi. pp. 773–789.

Octopus pictus, sp. n., Brock, Z. wiss. Zool. xxxvi. p. 603, pl. xxxvii. fig. 3, Sydney.

Octopus maorum (Hutt.), radula; Hutton, Tr. N. Z. Inst. xiv. p. 162, pl. vi. fig. A.

Octopus punctatus (Gabb.) eaten by Italian fishermen in San Francisco; Dall, Am. Nat. xvi. p. 967.

Tremoctopus ocellatus, sp. n., Brock, Z. wiss. Zool. xxxvi. p. 601, pl. xxxvii. figs. 1 & 2, Messina.

Argonauta argo (L.), third fresh specimen found on the New Jersey coast; Lockwood, Am. Nat. xv. p. 908.

Ægopsidæ.

Cranchia reinhardti (Steenstrup), perhaps = *maculata* (Leach), described by Brock, Z. wiss. Zool. xxxvi. p. 605, pl. xxxvii. fig. 4, South Atlantic.

Chiroteuthis lacertosa, sp. n., Verrill, Tr. Conn. Ac. v. [1881] pp. 299 & 408, pl. lvi. fig. 1, East Coast of North America.

Brachioteuthis beanii (Verrill, 1881) also described by the author in Tr. Conn. Ac. v. [1881] p. 406, pl. lv. fig. 3, and pl. lvi. fig. 2.

Desmoteuthis, g. n. for *Leachia hyperborea* (Steenstr.); *D. tenera*, sp. n., New England, Verrill, *l. c.* pp. 302 & 412, pl. lv. fig. 2, and pl. lvi. fig. 3.

Ancistroteuthis (Gray). This genus is found also in the South Sea; Steenstrup, Overs. Dan. Selsk. 1882, pp. 150–152.

Moroteuthis, g. n., proposed for *Lestoteuthis robusta* (Dall), North Pacific; Verrill, Am. J. Sci. (3) xxii. [1881] p. 298, foot-note. It cannot be distinguished from *Ancistroteuthis*; Steenstrup, *l. c.* p. 150.

Cucioteuthis, g. n., Steenstrup, Overs. Dan. Selsk. 1882, pp. 153–164. For the giant Cephalopod, the arm of which was brought home by [redacted] and described by R. Owen, Tr. Z. Soc. xi. [1881], p. 150, [redacted]iii., and another (probably the same) species, pieces of the arm of [redacted]ere described by Harting, Verh. Ak. Amst. ix. [1860] pl. iii. [redacted] & 17. The chief generical character consists in the peculiar [redacted]en and nut-shaped basal part of the hooks. It is by no means sure, whether all arms or only the tentacular arms bear hooks. The synonymy of the species is the following: *Sepia unguiculata* (Molina, 1872) = *Onychoteuthis molinæ*, Lichtenst., 1818, = *Enoploteuthis molinæ* (Orbigny) = *E. cooki* (Owen, 1881, pt.). The dried piece of hind part of the body with the fins, attributed to the same animal by Owen, *l. c.* pl. xxxi. figs. 2–4, probably belongs to a species of *Architeuthis*. Steenstrup has

also some doubts whether the mandibles, pl. xxx., belong to th[illegible] genus as the piece of the arm.

Abralia megalops, sp. n., Verrill, Am. J. Sci. (3) xxiv. p. 364, South Coast of New England.

Gonatus (Gray). Gray's typical specimen is really identical with Möller's *Onychoteuthis? amœna*, both sexes of which are known, and very distinct from Verrill's *Gonatus amœnus*, from Cumberland Gulf. The genus *Gonatus* occurs also in the Southern hemisphere, specimens having been found in the stomach of *Diomedea exulans*, somewhat south of the Cape, by Danish sailors; Steenstrup, *l. c.* pp. 143–150.

Chelotcuthis rapax (Verrill) probably = *Lestoteuthis fabricii* (Steenstr.), Verrill, Tr. Conn. Ac. v. [1881] p. 387, and Am. J. Sci. (3) xxii. p. 297. It is identical with *Gonatus fabricii*; Steenstrup, *l. c.* pp. 143–146.

Ommastrephes illecebrosus (Lesueur); full description by Verrill, Tr. Conn. Ac. v.

Ommastrephes sloanii (Gray), radula; Hutton, Tr. N. Z. Inst. xiv. p. 162, pl. v. fig. n.

(*Architeuthis.*) Observations on some of the more important specimens described from other than North American sources; Verrill, Tr. Conn. Ac. v. [Feb. 1880] pp. 238–245. A large specimen cast ash[illegible] Nov. 10, 1881, at St. John's, Newfoundland, body 5½ feet, with tentacular arms 28 feet; *id.* Am. J. Sci. (3) xxiii. p. 71, also in "New York Herald," Nov. 25, 1881; photograph in Harper's "Weekly Journal of Civilization," Dec. 10, 1881.

Architeuthis [?] *verrilli*, sp. n., Kirk, Tr. N. Z. Inst. xiv. p. 248, pl. xxxvi. fig. 2, Cook Strait; length of head and body 9 feet 1 inch, tentacular arms 25 feet. Intermediate between *Architeuthis* and *Stenoteuthis*, but differing much from both, and provisionally retained in the former. Abstract in Am. J. Sci. (3) xxiv. p. 477.

Plectoteuthis (Owen, 1881) = *Architeuthis* (Steenstrup); the arm described by R. Owen, Tr. Z. S. xi. p. 156, pls. xxxiv. & xxxv., is a hectocotylized ventral arm of *Architeuthis*. Steenstrup, Overs. Dan. Selsk. 1882, pp. 164–168.

Mouchezia (Velain, 1877) probably = *Architeuthis* (Steenstrup), the sudden blunt termination of the arms is no generic character, but the effect of mutilation by sharks or toothed whales; *id. l. c.* p. 158.

Steenstrupia, g. n., near *Architeuthis*, longer and more slender, arms relatively much smaller and shorter; shell lanceolate, with a small terminal hood. *S. stocki*, sp. n., length of head and body 11 feet [illegible] sessile arms 4 feet 2 inches, Cook Strait. Kirk, Tr. N. Z. Inst. xiv. [illegible] pl. xxxvi. fig. 2; abstract in Am. J. Sci. (3) xxiv. p. 477.

Myopsidæ.

Loligo pealii (Lesueur), var. *borealis* and var. *pallida*, East Coast of North America; Verrill, Tr. Conn. Ac. v. [1881] pp. 316 & 317, pl. xxxiv. figs. 1 & 4, pl. xxxvii. figs. 2 & 9–11.

Loligo bleekeri (Keferstein) from Japan described; Brock, Z. wiss. Zool. xxxvi. p. 604.

…a pacifica, sp. n., Kirk, Tr. N. Z. Inst. xiv. p. 283, Wellington, New Zealand.

Inioteuthis japonica (Orb., as *Sepiola*), and *morsii*, sp. n., Yedo Bay; Verrill, Tr. Conn. Ac. v. [1881] p. 417.

Rossia, anatomical notes; J. Brock, Z. wiss. Zool. xxxvi. pp. 543–549.

Rossia megaptera, sp. n., Verrill, *l. c.* p. 349, East Coast of North America.

Sepiadarium and *Idiosepius*. Abstract of Steenstrup's paper on them [Zool. Rec. xviii. *Moll.* p. 37] in French; Arch. Z. expér. x. pl. xlvii.

P. Fischer establishes a third Order in the Class of *Cephalopoda* for the Ammonites and their allies, intermediate between the *Dibranchiata* and *Tetrabranchiata*. J. de Conch. xxx. pp. 55–57.

PTEROPODA.

Popular note on some *Pteropoda* and their use as food, by Heincke, in his work, "Die nutzbaren Tiere der nordischen Meere," 1882, p. 24, woodcuts pp. 30–32.

Pleuropus hargeri, sp. n., Verrill, Tr. Conn. Ac. v. p. 555, off George's Bank, New England.

Embolus triacanthus, sp. n., Fischer, J. de Conch. xxx. p. 49, Southern Spain, Atlantic, 1205 metres.

Cymbulia calceolus (Verrill), New England; Verrill, *l. c.* p. 553, pl. lviii fig. 33.

Sinusigera and *Macgillivraya* are probably embryonal shells of *Purpura* and *Dolium*: Jousseaume, Le Nat. iv. pp. 182 & 183.

GASTROPODA.

PECTINIBRANCHIA.

Critical remarks on Tryon's Manual of Conchology by Kobelt, JB. mal. Ges. ix. pp. 51–67, and by Dall, Am. Nat. xvi. pp. 874–876.

Muricidæ.

Murex. Alphabetical list of known species by Gaudion, Bull. Soc. Béziers (2) iii.

Murex richardi, sp. n., Fischer, Rapport Faune sous-marine, p. 43, and J. de Conch. xxx. p. 49, Biscayan Sea, 896 metres.

Murex pliciferus (Sow.), *rota* (Sow.) var. and *foliatus* (Martyn), Dunker, Moll. Jap. pp. 4–7, pl. iv. figs. 1, 2, 10 & 11, and pl. ii. fig. 3, Japan.

Muricopsis, subg. n. of *Murex* (not characterized) for *M. blainvillii*, Payr., = *cristatus* (Brocchi), Bucquoy & Dautzenberg, Moll. mar. de Roussillon, i. p. 19.

Murex erinaceus (L.), varieties *tarentinus* (Lam.), *cinguliferus* and *decussatus* (Gm., Risso) ; *iid. l. c.* p. 22, pl. ii. figs. 1 & 2.

Corallinia, subg. n. (not characterized) for *Murex aciculatus* (Lam.) = *corallinus* (Scacchi) ; *iid. l. c.* p. 24, pl. ii. fig. 4.

Hadriania, g. n. General form and thin outer lip as in *Fusus*, canal closed and longitudinally crispated varices as in *Murex*. *H. craticulata* (Brocchi, *Murex*), Mediterranean Sea ; *iid. l. c.* p. 33, pt. ii. pl. vi. fig. 1.

Pseudomurex perfectus, sp. n., P. Fischer, J. de Conch. xxx. p. 274, Atlantic, 400 metres.

Trophon clathratus (L.), var. *gunneri* (Loven), New England ; Verrill, Tr. Conn. Ac. v. p. 512, pl. xliii. fig. 8.

Trophon lintoni, sp. n., Verrill & Smith, Am. J. Sci. (3) xxiv. p. 365, South Coast of New England

Trophon breviatus, sp. n., Jeffreys, Ann. N. H. (5) x. p. 426, Black Sea, 45–50 fath.

Trophon acanthodes, W. Patagonia, 125 fath., *carduelis*, off Sydney, 410 fath., *declinans*, off Marion Island, 100 fath. ?, *aculeatus*, off Pernambuco, 350 fath., *septus*, Kerguelen, 28 fath., and *scolopax*, between Kerguelen and Heard Islands, 150 fath., spp. nn. ; Watson, J. L. S. xvi. pp. 386–392.

Trophonopis, subg. n. of *Trophon*, proposed by Bucquoy & Dautzenberg, Moll. mar. de Roussillon, i. p. 40, for *Murex muricatus* (Mont.), and *Fusus radis* (Phil.)

Purpuridæ.

Purpura heyseana, sp. n., Dunker, Moll. Jap. p. 40, pl. xiii. figs. 10 & 11, Japan.

Purpura hæmastoma (L.). *Sinusigera* is probably the embryonal shell of it. Jousseaume, Le Nat. iv. p. 182.

Polytropa striata (Martyn), synonymy, Brazier, P. Linn. Soc. N. S. W. v. p. 481.

Rapana lischkeana and *japonica*, spp. nn., Dunker, Moll. Jap. p. 43, Japan.

Latiaxis (Swains.), 17 species, some very closely approaching *Corallio-phila*, described and figured by Sowerby, Thesaurus, v. pt. 37, pp. 1–5, pl. ccccxxiv.

Pseudolivia (*Macron*) *stereoglypta*, sp. n., Sowerby, P. Z. S. 1882, p. 119, pl. v. fig. 8, locality unknown.

Leptoconchus rostratus (A. Ad.), Dunker, Moll. Jap. p. 45, p. vi. figs. 20 & 21, Japan.

Buccinidæ.

Neptunea. H. Friele distinguishes 4 groups in this genus, characterized by the dentition, exemplified by *N. despecta* [typical], *islandica* [*Sipho* (Mörch)], *turgidula* and (*Mohnia*) *malmi* ; Norske N. H. Exped., *Buccinidæ*, p. 5.

Neptunea despecta (L.), radula, Friele, *l. c.* p. 10, pl. iv. figs. 8–10, var. n. *fasciata*, near Beeren Island, 447 fath., var. *fornicata* (Fabr., *nec* Reeve)

...nata (Kobelt), Iceland, 10–20 fath., var. *borealis* (Philippi, ...us), = *Fusus fornicatus* (Reeve), Spitzbergen; *id. l. c.* pp. 9 & 10, embryonal shell of the latter, pl. i. fig. 7.

Neptunea lurida and *plicata* (A. Ad.); Dunker, Moll. Jap. p. 14, pl. iii. figs. 1–4, Japan.

Fusus (*Neptunea*) *dalli*, Fiji, and *futile* [*-is*], between Kerguelen and Heard Islands, 150 fath., spp. nn., Watson, J. L. S. xvi. pp. 379–381.

[*Neptunea* ?] *Fusus corpulentus*, sp. n., E. A. Smith, Ann. N. H. (5) ix. p. 344, woodcut, locality unknown.

Jumala, g. n. Median plate of the radula small, four-sided, without cuspids; lateral plates with a large external cusp and two smaller ones. *Fusus turtoni* (Bean, *Fusus*) and *ossiani* (Friele, 1879, *Neptunea*), Sea of Norway. Friele, *l. c.* pp. 6 & 7; shell, operculum, and ovicapsule of the second, pl. i. fig. 6; radula of both species, pl. iv. figs. 1–3 & 4–7.

Troschelia (Mörch, 1876) *berniciensis* (King, *Fusus*), Northern Norway; its ? ovicapsule and embryo. Friele, *l. c.* pp. 25 & 26, pl. iii. fig. 12.

Siphonorbis (Mörch), subg. of *Neptunea*, apex depressed, embryonal shell with narrow, gradually diminishing whorls. *N.* (*S.*) *ebur* (Mörch) = *Trophon sarsi* (Jeffr.) = *Fusus mœbii* (Dunker & Metzger), *N.* (*S.*) *fusiformis* (Brod., *Buccinum*) = *F. fenestratus* (Turt.), *dalli*, sp. n., Arctic Sea between Norway, Beeren Island, and Spitzbergen, *turrita* (Sars) = *tortuosa* (Kobelt), *lachesis* (Mörch) with var. n. *bicarinata*, Arctic Sea, 358 fath., *undulata*, sp. n., near Beeren Island, 190 fath., and *danielsseni* (Friele). Friele, *l. c.* pp. 17–23; shells, operculum, embryonal whorls, and ovicapsules of some of them, pl. ii. figs. 18–35, pl. xix. figs. 1–6; dentition, pl. v. figs. 1–13.

Mohnia (Friele), subg. of *Neptunea*, operculum spirally twisted, median plate of the radula unidentate, laterals bidentate. *N.* (*M.*) *mohni* (Friele), cold area of the North Sea, at a depth of from 600–1300 fath. Friele, *l. c.* pp. 5, 24 & 25; shell, operculum, and embryonal shell, pl. iii. figs. 7–11; dentition, pl. v. figs. 14 & 15.

Pseudoneptunea, v. *Fusus* (*Fasciolariidæ*).

Pyrulofusus deformis (Reeve, *Fusus*). Friele, *l. c.* p. 8; operculum, pl. i. fig. 8; radula, pl. iv. figs. 11–13.

Siphonalia longirostris, sp. n., Dunker, Moll. Jap. p. 16, pl. i. figs. 13 & 14, Japan.

Neptunea (*Sipho*) *islandica* (Chemn.), *turgidula* (Jeffr.), *gracilis* (Da-costa) = *S. glaber* (Verkrüzen), *hanseni* (Friele), *virgata* (Friele), *curta* (Jeffr.), with many synonyms, *kroeyeri* (Möller) = *arctica* (Phil.), and *latericea* (Möller) = *pellucida* (Hancock). Friele, *l. c.* pp. 10–17; living animals, operculum, embryonal shells, and ovicapsules, pl. i. figs. 9–26, pl. ii. figs. 1–17; dentition, pl. iv. figs. 14–18, pl. vi. figs. 1–16.

Sipho stimpsoni (Mörch, 1867) = *islandicus* (Gould, Invert. Mass., *nec* L.) = *curtus* (Jeffr., 1867, pt.) = *americanus* (Bell), with varr. *brevis* and *liratulus*, Verrill, Tr. Conn. Ac. v. pp. 499 & 500, foot-note; *S. pubescens*, sp. n., = *propinquus* (Verrill, 1878, *nec* Alder), *S. sabinii* (Gray), *glyptus*, sp. n., = *latericeus* (Verrill, 1880, *nec* Möller), *parcus*, sp. n., and *cælatus* (Verrill & Smith), New England, Verrill, *l. c.*, pp. 501–506, pl. xliii., fig. 6,

and pl. lvii. figs. 19–25, pl. lviii. fig. 1. Also in P. U. S. Nat. [illegible] pp. 319–321.

Fusus (*Sipho*) *pupula*, sp. n., Fischer, J. de Conch. xxx. p. 274, Atlantic, 608 metres.

Fusus (*Sipho*) *pyrrhostoma*, S.S.E. of Cape of Good Hope, 98 fath., *calathiscus* and *setosus*, off Marion Island and the Crozets, 1600 fath., *scalaris*, N.W. Patagonia, 125 fath., *regulus*, Kerguelen, 28 fath., and *edwardiensis*, between Marion and Prince Edward's Island, 140 fath., spp. nn., Watson, J. L. S. xvi. pp. 374–379.

Euthria lineata (Gm.), radula and operculum; Hutton, Tr. N. Z. Inst. xiv. p. 162, pl. vi. fig. b.

Metula, 4 species enumerated by Kobelt, JB. mal. Ges. ix. p. 26. *Fusus* (*Metula*) *philippinarum*, sp. n., Watson, J. L. S. xvi. p. 373, Philippines. *Metula lintea*, sp. n., Guppy, P. Sc. Ass. Trinid., xii. 1881–82, Gulf of Paria.

Clavella (Swains.), 3 species enumerated by Kobelt, JB. mal. Ges. ix. p. 28.

Buccinum. W. H. Dall publishes some very valuable remarks on sexual and individual variations in size, sculpture, periostracum, presence of keel, absence of operculum, &c., in several species of this genus; Nachr. mal. Ges. 1882, pp. 119–121. Criticisms thereupon by Verkrüzen, *loc. cit.* pp. 161–172.

Buccinum, s. str., number of cusps in the single plates variable; many transitional forms exist between the acknowledged species, some of which may be hybrids. *B. grænlandicum* is first met with north of the Polar Circle in Europe, where it occurs at first in company with *undatum* (L.). *B. finmarchianum* takes the place of the more southern *humphreysianum*, to be in turn succeeded by *hydrophanum*. *B. grœnlandicum* (Chemn.), varr. nn. *acuta* and *hybrida*, Hammerfest, littoral, var. near *B. sericatum* (Hanc.), Arctic Norway, 136–649 fath. *B. hydrophanum* (Hanc.), Arctic Norway, 634 fath., and Spitzbergen, 60 fath., with varr. *tumidula* (G. O. Sars), (n.) *elata*, and *marchi* (Friele), the last 350–650 fath. *B. nivale*, sp. n., Vestfjord, Norway, 457 fath. *B. sulcatum*, sp. n., Arctic Norway, 649 fath. *B. terra-novæ* (Beck) = *donovani* (Reeve) = *totteni* (Friele), Spitzbergen, 20–60 fath., *glaciale* (L.), Jan Mayen, *tenue* (Gray), Spitzbergen, 20–30 fath. Friele, Norske N. H. Exped., *Buccinida*; shells, pp. 26–35, pl. iii. figs. 13–24; ovicapsules of some, figs. 16 & 23; operculum of *B. nivale*, fig. 25; remarkable variations of the dentition in *B. undatum*, p. 27, pl. v. figs. 16 & 17, in the latter the number of cusps in the median plate varying in neighbouring rows in the same individual from 6 to 8.

Kobelt continues his valuable critical monograph of this genus in Küster's Conch. Cab. pt. 317, pp. 41–72, pls. lxxxiii.–lxxxviii. The following species are not figured in other works: *B. amaliæ* (Verkrüzen), p. 44, pl. lxxxiii. fig. 1, Newfoundland; *picturatum* (Dall), p. 60, pl. lxxxv. fig. 7, Aleutian Islands; *B. turritum* (Verkrüzen), p. 69, pl. lxxxvii. fig. 2, Newfoundland, is, according to him, a variety of *glaciale* (L.).

Buccinum undatum var. *acutum*, *B. finmarchianum* var. *pellucidum*, and *B. pulcherrimum*, sp. n., from Russian Lapland and the White Sea, *B. in-*

exhaustum (Verkr.), varr. *B. schrenki* and *middendorffi*, Saghalien, *herzensteini* and *grebnitzkii*, Awatcha Bay, Kamtschatka, spp. nn., and notes on other species of this genus described by Middendorff from specimens in the St. Petersburg Museum; Verkrüzen, JB. mal. Ges. ix. pp. 203–221, & 359.

W. Kobelt adds some observations concerning the same specimens. He thinks that no Pacific form can be united specifically with *B. undatum* (L.), unites *B. schrenki* with *ochotense* (Midd.), and *grebnitzkii* with *totteni* (Stimps.), but adds *B. verkruezeni*, sp. n., Dui Island, Saghalien. *B. pulcherrimum* is, according to him, of a very peculiar character, and perhaps no *Buccinum*; l. c. pp. 229–235. *B. grebnitzkii* is distinct from *totteni*; Verkrüzen, *l. c.* pp. 361–364.

Buccinum sandersoni, sp. n., off Martha's Vineyard, 258 fath., and *cyaneum* (Brug.) with var. *perdix* (Mörch) = *finmarchianum* (Verkrüzen), and *B. tenue* (Gray), New England, Verrill, Tr. Conn. Ac. v. pp. 490–495, pl. xliii. figs. 4 & 5, and pl. lviii. figs. 9 & 11. *B. gouldi*, new name for *ciliatum* (Gould, Invert. Mass.), *id. l. c.* p. 497. The first also in P. U. S. Nat. Mus. v. p. 318, and note on it by Verkrüzen, JB. mal. Ges. ix. pp. 357–359.

Buccinum alho-zonatum, sp. n., Kerguelen, and *B.? aquilarum*, sp. n., Azores, 1000 fath., Watson, J. L. S. xvi. pp. 358 & 359.

Liomesus (Stimps., 1865) has priority over *Buccinopsis* (Jeffr., 1867); Verrill, Tr. Conn. Ac. v. p. 498.

Buccinopsis (Jeffr.) 3 species, *Neobuccinum* (E. A. Smith) 1, and *Chlanidota* (Martens) 1 sp., enumerated by Kobelt, JB. mal. Ges. ix. p. 27.

Volutharpa (Fischer), general remarks on this genus, differences from *Bullia*, and enumeration of the 6 known species, to which *V. paulucciana*, sp. n., also from Japan, is added, by Tapparone-Canefri, J. de Conch. xxx. pp. 24–30; the new species, pl. ii. figs. 3 & 4.

Truncaria (Ad. & Rv.), 6 species described, 5 of them figured by Tryon, Man. Conch. iv. pp. 9 & 10, pl. v. figs. 54–58.

Cominella funerea (Gould), radula and operculum; Hutton, Tr. N. Z. Inst. xiv. p. 162, pl. vi. fig. c.

Pollia (Gray), 52 species enumerated by Kobelt, JB. mal. Ges. ix. pp. 21–26.

Pisania (*Bivona*), 31 species enumerated by Kobelt, *l. c.* pp. 18–21.

Phos naucratoros, Admiralty Islands, and *bathyketes*, Philippines, Watson, J. L. S. xvi. pp. 360–362, spp. nn.

Northia (Gray), 3 species described and figured by Tryon, *l. c.* p. 9, pl. v. figs. 50–53.

Nassidæ.

Tryon, Manual of Conchology, iv. pp. 1–8, comprises in this family the following genera:—*Northia*, *Truncaria*, *Bullia* with 11 subdivisions, *Neritula*, *Desmoulea*, *Ptychosalpinx* (tertiary); the dentition of *Bullia* is figured, pl. iii. figs. 20 & 21, that of *Nassa*, figs. 22–25, of *Neritula*, fig. 26, that of the other genera is unknown.

Nassa (Lam.). 135 species and several varieties, regarded by former

authors as species, described and figured, *id. l. c.* pp. 17–64, pl. vii.–pl. xviii. fig. 348; the living animals of some species are also figured.

Nassa incrassata (Müll.), *pygmæa* (Lam.), *costulata* (Renier), and *corniculum* (Gmelin), their varieties in the Mediterranean; Bucquoy & Dautzenberg, Moll. mar. de Roussillon, pt. ii. pp. 44–49, 52–54 & 56–58, pt. iii. pls. xi. & xii. fig. 120.

Nassa edwardsi, sp. n., Fischer, Rapport Faune sous-marine, p. 18, and J. de Conch. xxx. p. 50, Southern Coast of France, 680–2660 metres.

Nassa ? nigro-labra (Verrill, 1880), New England, Verrill, Tr. Conn. Ac. v. p. 512, pl. lviii. fig. 12.

Nassa levukensis and *agapeta*, Fiji, 12 fath., *psila*, Torres Straits, 155 fath., *brychia*, Azores, 620 fath., *babylonica*, Philippines, 375 fath., *capillaris*, Fernando Noronha, 25 fath., and *ephamilla*, New Zealand, 700 fath.; Watson, J. L. S. xvi. pp. 363–371: spp. nn.

Neritula (Plane.), 3 species described and figured by Tryon, *l. c.* pp. 64 & 65, pl. xviii. figs. 353–360.

Desmoulea (Gray), 6 species, all from Africa or Japan, described and figured, *id. l. c.* pp. 65 & 66, pl. xviii. figs. 361–379; 9 species enumerated by Kobelt, JB. mal. Ges. ix. pp. 28 & 29.

Bullia (Gray), 11 typical species, 3 of subg. *Buccinanops* (Orb.), 2 of subg. *Pseudostrombus* (Kl.), and 1 of *Adinus* (H. & A. Ad.), described and figured by Tryon, *l. c.* pp. 11–16, pls. v. fig. 59, vi. fig. 98.

Bullia (*Adinus*) *crosseana*, sp. n., Tapparone-Canefri, J. de Conch. xxx. p. 23, pl. ii. figs. 1 & 2, locality unknown.

Olividæ.

In *Olivella leucozonias* and *biplicata* (Sow.), the internal walls are reabsorbed; in *Oliva* proper, *Agaronia*, and *Ancillaria*, this is not the case. Crosse & Fischer, J. de Conch. xxx. pp. 181–183, pl. viii. figs. 15 & 16.

Oliva (*Olivella*) *amblia* and *ephamilla*, off Pernambuco, 350 fath., and *vitilia*, St. Thomas, West Indies, 390 fath., Watson, J. L. S. xvi. pp. 341–343: spp. nn.

Fusidæ.

Fusus (Lam.), 84 known species enumerated by Kobelt, JB. mal. Ges. ix. pp. 8–17.

Fusus bocagii, sp. n., Fischer, Rapport sur la Faune sous-marine, p. 43, and J. de Conch. xxx. p. 49, West Coast of Spain and Portugal, 1068–2018 metres.

Fusus (*Colus*) *radialis*, off the Cape of Good Hope, 150 fath., *sarissophorus*, off Pernambuco, 350 fath., Watson, J. L. S. xvi. pp. 382–283: spp. nn.

Fusus lacteus, sp. n., Dunker, Moll. Jap. pp. 12 & 13, pl. ii. figs. 11 & 12, Japan.

Fusus pagoda and *pagodoides*, see *Columbarium*, among the *Pleurotomidæ*. For other so called species of *Fusus*, see among the *Buccinidæ*.

Pseudoneptunea, subg. n. of *Fusus*, for *F. multangulus* (Phil.) and *varicosus* (Chemn.), W. Kobelt, JB. mal. Ges. ix. p. 17.

...ria (Lam.), 17 species described and figured by Sowerby, Thesaurus, v. pt. 37, pp. 9–15, pls. ccccxxv.–ccccxxvii.

Fasciolaria rutila, off the Cape of Good Hope, 150 fath., and *maderensis*, off Teneriffe, 78 fath., Watson, J. L. S. xvi. pp. 336 & 337: spp. nn.

Fasciolaria glabra, sp. n., Dunker, Moll. Jap. p. 48, pl. xii. figs. 15 & 16, Japan.

Latirus troscheli, sp. n., Löbbecke & Kobelt, JB. mal. Ges. ix. p. 1, pl. i. fig. 1, Philippines.

Latirus carotianus = *Turbinella ustulata* (Kobelt, *nec* Reeve), *fischerianus*, New Caledonia, *funiculatus* and *melanorrhynchus*, localities unknown, spp. nn., and *scabrosus* (Reeve) var. n. *nigritellus*; Tapparone-Canefri, J. de Conch. xxx. pp. 31–37, pl. ii. figs. 6–13.

Turbinellidæ.

Turbinella (Lam.) in restricted sense, type *pyrum* (L.), to which *rapa* (Gmel.) is added as a variety, 4 species, and *Vasum* (Bolt.), type *muriaticum* [*muricatum*] (Born), 7 species, forming a special family *Turbinellidæ*, are described and figured by Tryon, Man. of Conch. iv. pt. 2, pp. 66–73, pls. xix.–xxi.; dentition of *Vasum*, pl. ii. fig. 1.

Mitridæ.

Tryon, *l. c.* pp. 106–109, arranges this family as follows:—*Mitra* (Lam.), *Volutomitra* (Gray), *Thala* (H. & A. Ad.), *Strigatella* (Swains.), *Zierliana* (Gray), *Mitroidea* (Pease), *Dibaphus* (Phil.), *Turricula* (Kl.), *Cylindra* (Schum.), and *Imbricaria* (Schum.). Dentition of *Volutomitra*, pl. ii. fig. 8, of *Mitra*, figs. 9–11, of *Zierliana*, fig. 12, of *Turricula*, fig. 13, of *Cylindra*, fig. 15, and three fossil uncharacterized genera.

Mitra (Lam.), 82 species described and figured; *id. l. c.* pp. 111–128, pls. xxxii.–xxxvii.

Mitra cryptodon, sp. n., P. Fischer, J. de Conch. xxx. p. 273, Atlantic, 1900 metres.

Mitra hanleyana (Dunker, 1877) = *wrighti* (Crosse), and *bronni* (Dunker) = *suluensis* and *fusco-apicata* (E. A. Smith), Dunker, Moll. Jap. p. 52, pls. ii. figs. 6 & 7, & v. figs. 5 & 6; *M. salmonea* (Sow.) var., *id. l. c.* p. 256, pl. v. figs. 9 & 10, all from Japan.

Mitra melvillii, sp. n., Sowerby, P. Z. S. 1882, p. 118, pl. v. fig. 7, locality unknown.

Volutomitra fragillima, sp. n., Watson, J. L. S. xvi. p. 334, Kerguelen, 28 fath.

Belomitra [see *Pleurotomidæ*].

Volutidæ.

Tryon, Man. of Conch. iv. pt. 2, pp. 73–78, arranges this family as follows:—*Cymbium* (Klein), *Melo* (Humphr.), *Voluta* (L.) including *Volutolyria* (Crosse), *Lyria* (Gray), and *Microvoluta* (Angas); he enumerates 11

Fasciola burchardi (Dunker), Dunker, Moll. Jap. p. 55, pl. iv. figs. 3 & 4, Japan.

Engina xantholeuca, sp. n., Sowerby, P. Z. S. 1882, p. 119, pl. v. fig. 9, Mauritius.

Marginellidæ.

Marginella and *Pseudomarginella*. J. Carrière repeats the strange statements concerning the difference of radula and operculum in inhabitants of scarcely discernible shells of *Marginella glabella*; Z. wiss. Zool. xxxvii. pp. 99–120, pl. ix. Abstracts in J. R. Micr. Soc. (2) ii. pp. 604 & 605; and Arch. Sci. nat. (3) vii. pp. 265–267.

Marginella roscida (Verrill, 1880), ? = *carnea* (Storer); Verrill, P. U. S. Nat. Mus. v. p. 317.

Conidæ.

Conus mediterraneus (Hwass), varieties, Bucquoy & Dautzenberg, Moll. mar. de Roussillon, pt. ii. pp. 82 & 83, pt. iii. pl. xiii. figs. 11–22.

Conus prytanis, Galapagos Islands, *semivelatus*, Red Sea, *wilmeri*, Andaman Islands, *evelynæ* and *dianthus*, localities unknown, spp. nn., and *textile* (L.), var. n. *euetrios*, Sowerby, P. Z. S. 1882, pp. 117, 118 & 120, pl. v. figs. 1–6.

Conus weinkauffi, sp. n., Löbbecke, JB. mal. Ges. ix. pp. 90 & 188, pl. iv. figs. 1–3, New Caledonia?. *C. kobelti*, id. *l. c.* p. 189, pl. iv. figs. 4 & 5, locality unknown.

Pleurotomidæ.

Pleurotoma dalli, sp. n., Verrill & Smith, Tr. Conn. Ac. v. p. 451, pl. lvii. fig. 1, and P. U. S. Nat. Mus. v. p. 323, off Martha's Vineyard, New England, 94–146 fath.

Pleurotoma (— ?) *albata*, sp. n., E. A. Smith, Ann. N. H. (5) x. p. 210, Persian Gulf. *P.* (— ?) *sex-costata*, sp. n., *id. l. c.* p. 305, Singapore.

[*Columbarium*] *Fusus pagoda* (Less.), operculum, Dunker, Moll. Jap. p. 13, pl. i. figs. 8–10, Japan. *Fusus pagodoides*, sp. n., Watson, J. L. S. xvi. pp. 383–385, off Sydney, 410 fath.

Drillia subauriformis (E. A. Smith)?; Dunker, Moll. Jap. p. 24, pl. iv. figs. 5–7, Japan.

Pleurotoma (*Drillia*) *exculpta*, *amblia*, *aglaophanes*, St. Thomas, W. Indies, 390 fath., *tholoides* and *lophoessa*, Pernambuco, 350 fath., spp. nn., Watson, J. L. S. xvi. pp. 247–253.

Pleurotoma (*Crassispira*) *microstoma*, Ceylon, *atramentosa* and *flavocarinata*, Panama, *caribbæa* and *melanacme*, West Indies, and *latizonata*, locality unknown, spp. nn.; *cubensis* and *albo-pustulata*, new names for *luctuosa* and *albo-maculata* (Orb.), preoccupied. E. A. Smith, Ann. N. H. (5) x. pp. 210–213.

Pleurotoma (*Clavus*) *interpunctata*, *interstrigata*, and *bellula*, West Indies, *hottentota* and *caffra*, South Africa, *coffea*, Philippine Islands, and

fossil genera, proposed mostly by Gabb & Conrad, all of which are probably subgeneric to *Voluta*; dentition of *Cymbium*, pl. ii. fig. 2, *Melo*, fig. 3, of *Voluta*, figs. 4–6, of *Lyria*, fig. 7. [The author does not appear to know Schacko's paper on the dentition of *Voluta* and *Cymbium*; see Zool. Rec. xviii. *Moll.* p. 43.]

Voluta (L.), 68 species and some varieties, distributed into 15 subgenera, described and figured by Tryon, *l. c.* pp. 82–101, pls. xxiv.–xxix.

Lyria (Gray), 16 species described and figured, *id. l. c.* pp. 102–105, pl. xxxi. figs. 133–150.

Cymbiola lutea, sp. n., Watson, J. L. S. xvi. p. 331, W. of New Zealand, 275 fath.

Volutilithes abyssicola (Ad. & Rv.), full grown specimen, height 3·8; described by Watson, *l. c.* pp. 327–329.

Provocator, g. n. Shell smooth, fusiform, having the apex of *Ancillaria*, the enamelled suture of *Bullia*, the pillar-folds of *Voluta*, and the sinus of *Pleurotoma*. *P. pulcher*, sp. n., between Kerguelen and Heard Island, 150 fath., height 3·6. Watson, *l. c.* pp. 329 & 330.

Wyvillea, g. n. Shell ovate, cymbiform, thin, rough, spire high scalar, apex mamillate and irregular, suture canaliculate; mouth large, ovate, inner lip with a wide-spread thinnish callus; pillar perpendicular, with a very slight turn, without teeth, but with an abrupt break of the edge about the middle of its length; no operculum. *W. alabastrina*, sp. n., height 6·6, off Marion Islands and the Crozets, 1600 fath. *Id. l. c.* p. 332.

Microvoluta australis (Angas), Tryon, *l. c.* p. 105, pl. xxxi. figs. 151 & 152.

Cymbium (Klein), 5 species admitted and figured; *id. l. c.* pp. 78–80, pl. xxii. figs. 1–13.

Melo (Humphr.), only 4 species with numerous varieties admitted and described; *id. l. c.* pp. 80–82, pl. xxiii.

Columbellidæ.

Columbella costulata (Cantraine, *Fusus*, 1837) = *haliaeti* (Jeffr.), Mediterranean, 85–544 fath., Jeffreys, Ann. N. H. (5) x. p. 32.

Columbella (*Anachis*) *ostreicola*, sp. n., Sowerby, P. Z. S. 1882, p. 119, pl. v. fig. 10, Florida, on *Ostrea virginiana*.

Columbella (*Pyrene*) *strix* and *stricta*, spp. nn., St. Thomas, W. Indies, 390 fath., Watson, J. L. S. xvi. pp. 338–340.

Columbellopsis, subg. n. of *Columbella*, not characterized; type, *C. minor* (Scacchi), Bucquoy & Dautzenberg, Moll. mar. de Roussillon, pt. ii. p. 77, pt. iii. pl. xiii. figs. 9 & 10.

[?] *Columbella choava* (Reeve), no operculum, median plate of the radula without teeth; Hutton, Tr. N. Z. Inst. xiv. p. 163, pl. vii. figs. o & p.

Astyris diaphana and *pura*, spp. nn., New England, 65–487 fath., formerly confounded with *rosacea* (Gould) and *zonalis* (Linsley), Verrill, Tr. Conn. Ac. v. pp. 513–515, the former, pl. lviii. fig. 2, and also in P. U. S. Nat. Mus. v. pp. 322 & 323.

Fasciola burchardi (Dunker), Dunker, Moll. Jap. p. 55, pl. iv. figs. 3 & 4, Japan.

Engina xantholeuca, sp. n., Sowerby, P. Z. S. 1882, p. 119, pl. v. fig. 9, Mauritius.

Marginellidæ.

Marginella and *Pseudomarginella*. J. Carrière repeats the strange statements concerning the difference of radula and operculum in inhabitants of scarcely discernible shells of *Marginella glabella* ; Z. wiss. Zool. xxxvii. pp. 99–120, pl. ix. Abstracts in J. R. Micr. Soc. (2) ii. pp. 604 & 605 ; and Arch. Sci. nat. (3) vii. pp. 265–267.

Marginella roscida (Verrill, 1880), ? = *carnea* (Storer) ; Verrill, P. U. S. Nat. Mus. v. p. 317.

Conidæ.

Conus mediterraneus (Hwass), varieties, Bucquoy & Dautzenberg, Moll. mar. de Roussillon, pt. ii. pp. 82 & 83, pt. iii. pl. xiii. figs. 11–22.

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Conus weinkauffi, sp. n., Löbbecke, JB. mal. Ges. ix. pp. 90 & 188, pl. iv. figs. 1–3, New Caledonia ?. *C. kobelti*, id. *l. c.* p. 189, pl. iv. figs. 4 & 5, locality unknown.

Pleurotomidæ.

Pleurotoma dalli, sp. n., Verrill & Smith, Tr. Conn. Ac. v. p. 451, pl. lvii. fig. 1, and P. U. S. Nat. Mus. v. p. 323, off Martha's Vineyard, New England, 94–146 fath.

Pleurotoma (— ?) *albata*, sp. n., E. A. Smith, Ann. N. H. (5) x. p. 210, Persian Gulf. *P.* (— ?) *sex-costata*, sp. n., *id. l. c.* p. 305, Singapore.

[*Columbarium*] *Fusus pagoda* (Less.), operculum, Dunker, Moll. Jap. p. 13, pl. i. figs. 8–10, Japan. *Fusus pagodoides*, sp. n., Watson, J. L. S. xvi. pp. 383–385, off Sydney, 410 fath.

Drillia subauriformis (E. A. Smith) ? ; Dunker, Moll. Jap. p. 24, pl. iv. figs. 5–7, Japan.

Pleurotoma (*Drillia*) *exculpta*, *amblia*, *aglaophanes*, St. Thomas, W. Indies, 390 fath., *tholoides* and *lophoessa*, Pernambuco, 350 fath., spp. nn., Watson, J. L. S. xvi. pp. 247–253.

Pleurotoma (*Crassispira*) *microstoma*, Ceylon, *atramentosa* and *flavocarinata*, Panama, *caribbæa* and *melanacme*, West Indies, and *latizonata*, locality unknown, spp. nn. ; *cubensis* and *albo-pustulata*, new names for *luctuosa* and *albo-maculata* (Orb.), preoccupied. E. A. Smith, Ann. N. H. (5) x. pp. 210–213.

Pleurotoma (*Clavus*) *interpunctata*, *interstrigata*, and *bellula*, West Indies, *hottentota* and *caffra*, South Africa, *coffea*, Philippine Islands, and

albo-angulata, *spinosa*, *diversa*, *amanda*, *quadrilirata*, localities unknown, spp. nn., *id. l. c.* pp. 206–208.

Pleurotoma (*Clionella*) *quadruplex*, sp. n., Watson, J. L. S. xvi. p. 258, W. of Azores, 1000 fath.

Pleurotomella packardi (Verrill, 1872), *agassizi* and *pandionis* (Verrill, 1880), New England, fully described, also the dentition; Verrill, Tr. Conn. Ac. v. pp. 453–456, pl. xliii. fig. 9, and pl. lvii. figs. 3–5.

Mangelia cerina (Kurtz & Stimps.); *id. l. c.* p. 488, woodcut, New England.

Pleurotoma (*Mangelia*) *modica* and *filicincta*, Japan, *trizonata*, Philippines, *rufo-cincta*, Porto Cavalho, America, *ordinaria*, Chili and Peru, *inepta* and *mille-striata*, West Indies, *caledonica*, New Caledonia, *pellii*, Persian Gulf, and *minutistriata*, *platychila*, *flexuosa*, *opalina*, and *acutangulus*, localities unknown, spp. nn., and *decora*, new name for *costata* (Gray, Reeve, *nec* Pennant); E. A. Smith, *l. c.* pp. 213–218.

Defrancia nodulosa, *tenella*, and *convexa*, spp. nn., Jeffreys, Ann. N. H. (5) x. pp. 32 & 33, Mediterranean, 611–1216, 1963 & 217 fath.

Pleurotoma (*Defrancia* = *Clathurella*) *rubro-apicata*, *asperulata*, and *reticulata*, Japan, *piperata*, Straits of Corea, *capensis*, South Africa, *albicaudata*, Persian Gulf, *moretonica*, Queensland, *commoda*, California, and *trifilosa*, *alternans*, *subgranosa*, and *associata*, localities unknown; E. A. Smith, *l. c.* pp. 296–300.

Pleurotoma (*Glyphostoma*) *soror*, Persian Gulf, *rubro-cincta*, Fiji Islands, *bathyraphe*, Philippines, *biseriata* and *obtusicostata*, localities unknown, spp. nn., and *exquisita*, new name for *vittata* (Reeve, *nec* Hinds); *id. l. c.* pp. 303–305.

Pleurotoma (*Daphnella*) *souverbiei*, Swan River, *supercostata*, Japan, *macandrewi*, Persian Gulf, *butleri*, Philippines, *tenuiclathrata*, *tenella*, and *gealii*, localities unknown, spp. nn., *id. l. c.* pp. 300–303.

Bela pygmæa, *incisula*, *gouldi*, *concinnula*, spp. nn., and *hebes* (Verrill, 1880), *pingeli* (Möller), *scalaris* (Möller), = *turricula* (Gould, Invert. Mass., *nec* Montague), *harpularia* (Couth.), *cancellata* (Stimps.), *decussata* (Couth.), with var. n. *pusilla*, and *bicarinata* (Couth.), all from New England, exactly described and figured by Verrill, Tr. Conn. Ac. v. pp. 457–483, pl. xliii. figs. 10–16, and pl. lvii. figs. 7–16; the new ones also in P. U. S. Nat. Mus. v. pp. 326–328.

Belomitra, g. n., shell like that of *Bela*, but pillar-lip provided with numerous small deep plaits: *B. paradoxa*, sp. n., Atlantic, 627 metres, P. Fischer, J. de Conch. xxx. p. 275.

Taranis morchi (Malm), and *pulchella* (Verrill), New England; Verrill, Tr. Conn. Ac. v. pp. 486 & 487, pl. lvii. figs. 17 & 18.

Pleurotoma (*Taranis*?) *turritispira*, sp. n., E. A. Smith, Ann. N. H. (5) x. p. 306, Japan.

Terebridæ.

Terebra lischkeana (Dkr.), *læbbeckeana* (Dkr.), and *triseriata* (Gray); Dunker, Moll. Jap. pp. 71 & 72, pl. v. figs. 13–20, Japan.

Cancellariidæ.

Cancellaria imbricata, sp. n., Watson, J. L. S. xvi. p. 325, off Cape of Good Hope, 150 fath.

Cancellaria (*Admete*) *specularis* and *carinata*, id. *l. c.* pp. 325–327, Kerguelen, 28–30 fath. : spp. nn.

Cassididæ.

Apollon leucostoma (Lam.) var. ; Löbbecke & Kobelt, JB. mal. Ges. ix. p. 2, pl. i. fig. 2.

Dolium bairdi (Verrill & Smith), nucleus; Verrill, P. U. S. Nat. Mus. v. p. 329. Also found in deep water of the West Indies; Dall, Am. Nat. xvi. p. 885.

Macgillivraya is probably the embryonal shell of *Dolium* ; Jousseaume, Le Nat. iv. p. 183.

Cypræidæ.

Porcellana (Rump.) ; priority claimed for it over *Cypræa* (L.), by Brazier, P. Linn. Soc. N. S. W. v. p. 503. [Ante-Linnean; Rec.]

60 known species from New Caledonia enumerated by R. Rossiter, P. Linn. Soc. N. S. W. vi. pp. 817–831.

Cypræa, *Luponia*, and *Trivia* : 9 species collected at Victoria by J. F. Bailey, enumerated by Brazier, *op. cit.* vii. pp. 117–121.

Cypræa citrina (Gray) found on the Rowley Shoals, N.W. Coast of Australia ; *id. l. c.* p. 322.

Cypræa tabescens, var. n. *alveolus*; Tapparone-Canefri, J. de Conch. xxx. p. 30, pl. ii. fig. 5, Mauritius.

Cypræa hirundo (L.) var. n. *rouxi* and *C. clandestina* (L.) var. *aberrans*, Ancey, Le Nat. 1882, No. 7, p. 55, New Caledonia.

Malformed specimen of *Cypræa poraria* (L.), destitute of white dots, aperture shaped like the figure 8 ; Brazier, P. Linn. Soc. N. S. W. vi. p. 202.

Ovulidæ.

Ovula (Brug.). List of known species by H. C. Weinkauff, JB. mal. Ges. ix. pp. 171–179.

Volva depressa (Sow.), N. W. Australia ; Brazier, P. Linn. Soc. N. S. W. v. p. 482. *Ovulum depressum*, var. n. *rosea* ; Rossiter, *tom. cit.* p. 323, Lifoa, Loyalty Islands.

Radius adamsi (Dkr., *Volva*) ; Dunker, Moll. Jap. p. 102, pl. xiii. figs. 3 & 4, Japan.

Naticidæ.

Lunatia nana (Möller), *levicula* (Verrill, 1880), and a deep water variety of *heros* (Say), New England; Verrill, Tr. Conn. Ac. v. pp. 516 & 517, the first pl. xlii. fig. 9.

Neverita reiniana, sp. n., Dunker, Moll. Jap. p. 62, pl. iv. figs. 15 & 16, Japan.

Sigaretus (Lam.), including *Naticina* (Gray); 28 species described and figured by Sowerby, Thesaurus, v. pt. 38, pp. 39–47, pls. ccccxli.–ccccxlii. *bis*.

Marseniidæ.

Lamellaria pellucida (Verrill, 1880) with var. n. *gouldi*, New England, 86–458 fath., Verrill, Tr. Conn. Ac. v. p. 518, pl. lviii. figs. 3–5, and P. U. S. Nat. Mus. v. p. 329.

Marsenina glabra (Couth., 1838) = *micromphala* (Mörch), *prodita* (Loven), and *ampla* (Verrill), New England; Verrill, Tr. Conn. Ac. v. pp. 517 & 518, pl. xlii. figs. 1–4.

Trichotropidæ.

Torellia fimbriata, sp. n., with var. n. *tiarella*, and *T. vestita* (Jeffr.), New England, 52–258 fath., Verrill, *l. c.* pp. 520 & 521, pl. lvii. fig. 27, dentition, fig. 27*a*, and pl. xlii. fig. 5; also in P. U. S. Nat. Mus. v. pp. 330 & 331.

Xenophoridæ.

Xenophora: facts and thoughts concerning it, by W. H. Dall, Address Am. Ass. Montreal Meet. 1882, p. 15.

Struthiolariidæ.

Struthiolaria papulosa (Martyn), radula remarkably like that of the *Calyptræidæ*; Hutton, Tr. N. Z. Inst. xiv. p. 163, pl. vi. fig. 11. [Seven plates in each row, as normally in the *Taenioglossa*, whereas *S. mirabilis* (E. A. Smith), *Perissodonta*, Martens, has 13; Zool. Rec. xiii. *Moll.* p. 27.]

Cerithiidæ.

Cerithium kobelti (Dkr.), Dunker, Moll. Jap. p. 106, pl. iv. figs. 8 & 9, Japan.

Vertagus pfefferi, sp. n., *id. l. c.* p. 108, pl. iv figs. 12–14, Japan.

Cerithiella, new name for *Lovenella* (G. O. Sars, preoccupied in *Hydroidea*), *C. whiteavesi* (Verrill, 1880), New England, 200–500 fath.; Verrill, Tr. Conn. Ac. v. p. 522, pl. xlii. fig. 7.

Lampania aterrima, sp. n., Dunker, Moll. Jap. p. 109, pl. v. figs. 7 & 8, Japan.

Melaniidæ.

The genera and species of this family, according to A. Brot's monograph in the new edition of Chemnitz, enumerated by Kobelt, JB. mal. Ges. ix. pp. 121–142.

...recticosta, sp. n., Martens, JB. mal. Ges. ix. p. 248, Murie Camlet, Angola.

Melania forestieri, sp. n., Crosse & Fischer, J. de Conch. xxx. p. 112, pl. vii. fig. 4, Cambodia.

Melania queenslandica, *elseyi*, and *subsimilis*, spp. nn., *balonnensis* (Conrad) = *tetrica* (Conrad) = *incerta* (Brot), *denisoniensis* and *venustula* (Brot), all from Australia; E. A. Smith, J. L. S. xvi. pp. 257–262, pl. v. figs. 1–13.

Melania tatii, new name for *tetrica* (Conrad, *nec* Gould) = *balonnensis* (Brot, *nec* Conrad), New South Wales and Queensland, distinguished from *M. balonnensis* (Conrad), Lower Murray River; Brazier, P. Linn. Soc. N. S. W. vi. pp. 551 & 552.

Melania californica, sp. n., Clessin, Mal. Bl. (2) v. p. 189, pl. iv. fig. 8, California.

Paramelania: note on it by E. A. Smith, Nature, xxv. p. 218.

Doryssa audeberti, sp. n., Mousson, J. de Conch. xxx. p. 47, pl. iii. fig. 7, Madagascar. Is no *Doryssa*, but a form of *Melanatria fluminea* (Gmel.); *id. l. c.* p. 183.

Melanatria johnsoni, sp. n., E. A. Smith, P. Z. S. 1882, p. 383, pl. xxii. figs. 6 & 7, River Kamony, N. W. Madagascar.

Turritellidæ.

Turritella auro-cincta, sp. n., Martens, SB. nat. Fr. 1882, p. 107, Friendly Islands.

Litorinidæ.

Litorina. Weinkauff continues and finishes his monograph in Küster's Conch. Cab. pts. 315 & 318, pp. 41–114, pls. vi.–xiv.; *L.* (*T.*) *pfeifferianus*, new name for *nodulosa* (Pfr., *nec* Gmel.) = *tuberculata* (Orb., *nec* Wood), p. 46, and *cubana*, sp. n., p. 68, pl. ix. figs. 2 & 3, Cuba. He brings up the number of known species to 131, 118 of which are described and figured by him, some copied from other works.

Littorina cincta (Q. & G.) and *cærulescens* (Lam.) [*diemenensis*, Q. & G.] radula, Hutton, Tr. N. Z. Inst. xiv. p. 164, pl. vii. figs. D, E.

Lacuna glacialis (Möller), figured from New England specimens by Verrill, Tr. Conn. Ac. v. p. 522, pl. xlii. fig. 6.

Modulus morleti, sp. n., Fischer, J. de Conch. xxx. p. 109, pl. vii. fig. 2, New Caledonia.

Fossarus elegans, sp. n., Verrill & Smith, Tr. Conn. Ac. v. p. 522, pl. lvii. fig. 28, and P. U. S. Nat. Mus. v. p. 331, off Martha's Vineyard, 100 fath.

Fossarina varius[-*a*] (Hutt.): the operculum and radula resemble those of *Littorina*; Hutton, Tr. N. Z. Inst. xiv. p. 164, pl. vii. figs. B, C. But in *Fossarina petterdi* (Brazier), the operculum is multispiral, and the dentition that of the *Trochidæ*; id. P. Linn. Soc. N. S. W. vii. p. 66.

Teretropoma, g. n.: shell and operculum like those of *Torinia*, dentition, according to the author, similar to that of *Litorina*; lives on the rocks,

a few metres above the breaking of the waves. *T. perrieri*, [illegible] Dakar, Coast of Senegal. Rochebrune, Bull. Soc. Philom. 1881, [illegible] stract in J. de Conch. xxx. p. 249 (the author places it in the *Cyclost[illegible] macea*).

Rissoidæ.

Rissoina assimilis, *dimidiata*, and *angulata*, spp. nn., Jickeli, JB. mal. Ges. ix. pp. 368 & 369, Red Sea.

Rissoa: 2 plates without letterpress by Weinkauff in Küster's Conch. Cab. pt. 318.

Cingula harpa (Verrill, 1880), *globulus* (Möller), *areolata* (Stimps., as *Turritella*), *jan-mayeni* (Friele), and *castanea* (Möller), New England and Gulf of St. Lawrence; Verrill, Tr. Conn. Ac. v. pp. 523–525, pl. xlii. fig. 8, pl. xliii. figs. 1–3, and pl. lviii. fig. 6.

Pachydrobia spinosa var. n. *acuminata*, Ancey, Le Nat., 1882, p. 69, Cambodia.

Amnicola zopissa, sp. n., and *granulum* (Villa), Sardinia; Mme. Paulucci, Bull. Soc. mal. Ital. viii. pp. 338 & 339, pl. ix. figs. 8 & 9.

Amnicola siculina, sp. n., Benoit, Nuov. Catal. p. 103, Sicily.

Hydrobia ortygia and *calcarea*, spp. nn., *id. l. c.* pp. 159 & 160, Sicily.

Hydrobia brazieri, *petterdi*, and *angasi*, spp. nn., and *victoriæ* (Tenison Woods), Australia, E. A. Smith, J. L. S. xvi. pp. 269–271, pl. vii. figs. 20–23.

Thermohydrobia zinnigasensis, sp. n., warm springs of Zinnigas, Sardinia, and *aponensis* (Martens), Abano; Mme. Paulucci, Bull. Soc. mal. Ital. viii. pp. 340 & 341, pl. ix. figs. 6 & 7.

Potamopyrgus cumingianus (Fischer), from the northern part of the north island of New Zealand and valley of the Waikato, is distinct as to radula from *P. corolla* (Gould), which occurs in the South Island, and from *antipodum* (Gray), throughout the whole of New Zealand; their synonymy explained. *P. pupoides*, sp. n., estuary of the Avon and Heathcote Rivers, N. Z. The two first-named only live in fresh water, the third extends also into brackish water, to which the last is confined. Hutton, Tr. N. Z. Inst. xiv. pp. 143–146, pl. i. figs. A–H.

Bythinella schotzii [*scholtzii*], from Silesia, living animal described; Merkel, Nachr. mal. Ges. 1882, p. 66.

Belgrandia (Bourg.), *gibba* (Drap.), S. France, *lusitanica* (Paladilhe), Coimbra, *targioniana* (Paulucci, MS.), sp. n., Florence, *thermalis* (L.) = *saviana* (Issel), S. Giuliano, near Pisa, *delpretiana* (Paulucci, MS.), sp. n., Viareggio, Upper Italy, *gibberula* (Paladilhe), S. France, *moitessieri* (Bourg.), S. France, *varica* (Paget), Nice, *cylindracea* (Paladilhe), Dép. Aube, *bourguignati* (St. Simon), Toulouse, *sequanica* (Bourg.), Troyes, *marginata* (Mich.), Dép. Var and Pyrénées-orientales, described and figured, and some dubious and fossil species enumerated by Clessin, Mal. Bl. (2) v. pp. 132–151, pls. ii. & iii.

Paludinella sorgica and *provincialis*, spp. nn., Coutagne, Note, Fn. mal. Rhone, i. [1881]. Vaucluse and Rognac, S. France.

Vitrella (Clessin), *quenstedti* (Wiedersh.), Falkenstein-cave, Württemberg, *perkhaueri* (Clessin), Rothenburg, Bavaria, *pellucida* (Benz.), Cann-

stadt, Württemberg, *turrita* (Clessin), Erlangen, Bavaria, *acicula* (Held.), Munich, *gracilis*, sp. n., Carniolia, *rougemonti*, sp. n., from a well in Munich, *tschapecki* (Clessin), cave near St. Martin in Styria, *helvetica*, sp. n., Waldshut, Upper Rhine Valley, *sterkiana*, sp. n., St. Gallen, *charpii* (Paladilhe), Doubs and Haute-Saone, *drouetiana*, sp. n., Chatillon, French Jura, and *allingensis* (Clessin), quaternary, near Regensburg, all described and, with one exception, figured. The author states that, probably, all live in limestone caves, and that only dead specimens are found in the alluvial deposits of rivers; he thinks that every species is confined to one cave. *Locardia* (Folin) and *Lhotelleria* (Bourg.) are probably generically identical with *Vitrella*, to which *Lartetia* and *Paladilhia* (Bourg.) may be nearly allied. Clessin, Mal. Bl. (2) v. pp. 114–129, pls. i. & ii. figs. 11 & 12.

Lhotelleria (Bourg.). Pillar lip flattened, base of the aperture somewhat produced into a gutter; lives in fresh and brackish water. Bourguignat, Lettres malacologiques, pp. 41 & 42. *L. letourneuxi* and *pechaudi* (Bourg.), figured, *ibid.* figs. 7–9 & 10–12.

Lartetia (Bourg., 1869), characterized by the prominent external wall of the aperture, and its drawing back at the suture. *L. michaudi*, *terveri*, both in the alluvial deposits of the Rhone, near Lyons, *lacroixi* and *burgundina*, cold spring near Beaune, Dép. Côte d'Or, *rayi* (Bourg., MS.), alluvial deposits of the Seine, Dép. Aube, spp. nn., *charpii* (Paladilhe, *Hydrobia*), Combe-des-Bois, Dép. Doubs, and *diaphana* (Mich., *Paladina*), alluvial deposit of the Rhone near Lyons. Locard, Monogr. du genre Lartetia, Contributions à la faune Malac. Franç. iii. 24 pp., pl., figs. 1–14, also in Ann. Soc. Linn. Lyon, xxix. Abstract in J. de Conch. xxx. p. 318.

Paladilhia robiciana, sp. n., Clessin, Mal. Bl. (2) v. p. 130, pl. ii. fig. 15, Ulrichsberg, in Carniolia.

Moitessieria lineolata, sp. n., Coutagne, Note Fn. mal. Rhone, i. [1881], alluvial deposits of the Rhone.

Rissoellidæ.

Dardania, g. n. Shell like a smooth *Rissoa*; operculum with a long shelly process from below the nucleus; tentacles long, setaceous. *D. olivacea*, sp. n., Lyttelton Harbour, New Zealand, on seaweed in rock-pools. Hutton, Tr. N. Z. Inst. xiv. p. 147, pl. i. fig. K. [Perhaps = *Jeffreysia*, Ald.; Rec.]

Paludinidæ.

[Bythi]nara vera (Frauenf.) [*Listeri*, Forbes] var., animal pale orange, [with] black points, Danzig; Schuman, Schr. Ges. Danz. (2) v. pt. 4. *[Bythi]nara waterhousii* and *kingi* (Ad. Angas), Arnheims Land, N. Australia, *tricincta* and *dimidiata*, spp. nn., N. Australia; E. A. Smith, J. L. S. xvi. pp. 264–266, pl. vii. figs. 14–17.

Cleopatra trabonjiensis, sp. n., *id.* P. Z. S. 1882, p. 384, pl. xxii. figs. 10 & 11, Madagascar.

Bithynia proxima (Frauenf.) from Sardinia; Mme. Paulucci, Bull. Soc. mal. Ital. viii. p. 334, pl. ix. fig. 5.

Bithynia anapensis, sp. n., Benoit, Nouv. catal. p. 101, Anapo River, Sicily.

Bithynia australis, sp. n., E. A. Smith, J. L. S. xvi. p. 267, pl. vii. fig. 18, Victoria River, N. Australia.

Tatea rufilabris (A. Ad., *Diala*) = *Bithynia huonensis* (Tenison Woods). New South Wales and Tasmania; *id. l. c.* p. 268, pl. vii. fig. 19.

Ampullariidæ.

Ampullaria. 224 recent species, including *Lanistes*, enumerated by Gaudion, Bull. Soc. Béziers, iv. [1879].

Ampullaria madagascariensis, sp. n., E. A. Smith, P. Z. S. 1882, p. 384, pl. xxii. figs. 8 & 9, Central Madagascar.

Ampullaria subscutata, sp. n., Mousson, J. de Conch. xxx. p. 46, pl. iii. fig. 6, Madagascar.

Calyptræidæ.

Trochita novæ-zeelandiæ (Lesson) radula; Hutton, Tr. N. Z. Inst. xiv. p. 163, pl. vii. fig. A.

Capulus dilatatus (A. Ad.); Dunker, Moll. Jap. p. 258, pl. xii. figs. 12–14, Japan.

Scalariidæ.

Scalaria tenuisculpta, sp. n., Martens, SB. nat. Fr. 1882, p. 107, Cape Verde Islands.

Scalaria dalliana and *pourtalesi* (Verrill & Smith, 1880), *S.* (*Opalia*) *andrewsi*, sp. n., and *S.* (*Cirsotrema*) *lecana*, sp. n., New England, 100–146 fath.: Verrill, Tr. Conn. Ac. v. pp. 526 & 527, pl. lvii. figs. 32–35; also P. U. S. Nat. Mus. v. p. 332.

Acirsa gracilis (Verrill, 1880), New England; *id. l. c.* p. 528, pl. lvii. fig. 31.

Aclis striata (Verrill, 1880), *walleri* (Jeffr.), and *tenuis*, sp. n., *id. l. c.* p. 528, pls. lvii. fig. 36, lviii. figs. 13 & 19, New England.

Solariidæ.

Solarium, embryonal shell sinistral, visible within the umbilicus; Jousseaume, Le Nat. 1882, p. 158.

Solarium boreale (Verrill & Smith, 1880), New England, 115–146 [illegible] Verrill, *l. c.* p. 529, pl. lvii. figs. 29 young, 30 adult.

[*H*]*Omalaxis? lirata*, sp. n., *id. l. c.* p. 529, Rhode Island, 8½ f[illegible]

Ianthinidæ.

Ianthina (Lam.). 11 species described and figured by Sowerby, Thesaurus, v. pt. 38, pp. 49–53, pl. ccccxliii. & ccccxliv.; many of Reeve's species united with others as varieties.

Ianthina communis (Lam.), radula; Hutton, Tr. N. Z. Inst. xiv. p. 164, pl. vii. fig. F.

Reclusia erythræa, sp. n., Jickeli, JB. mal. Ges. ix. p. 367, Dahlak Islands, Red Sea.

Pyramidellidæ.

Syrnola solidula (Dkr., *Obeliscus*) var. n. *fasciata*; Jickeli, JB. mal. Ges. ix. p. 367, Suez.

Elusa rueppelli, sp. n., *id. ibid.*, Red Sea.

Turbonilla emertoni, sp. n., *bushiana*, new name for *formosa* (Verrill & Smith, preoccupied), and *rathbuni*, Verrill, Tr. Conn. Ac. v. pp. 536 & 537, pl. lviii. figs. 14 & 16; also in P. U. S. Nat. Mus. v. p. 335, New England.

Turbonilla smithi, Verrill, Tr. Conn. Ac. v. p. 538, pl. lviii. fig. 18. Transferred to *Eulimella*; id. P. U. S. Nat. Mus. v. p. 335.

Eulimella smithi and *polita* (Verrill), New England, 85–120 & 20 fath.; *id.* Tr. Conn. Ac. v. p. 538, the former pl. lviii. fig. 18, the latter in woodcut; and P. U. S. Nat. Mus. v. p. 335.

Menestho bruneri, sp. n., *id. ll. cc.* pp. 539 & 335, off Newport, Rhode Island, 487 fath.

Eulimidæ.

Eulima caledonica (Morlet), Ancey, Le Nat. 1882, p. 55.

Stilifer stimpsoni (Verrill), New England, on *Echinus drœbachiensis* and *curtus*, sp. n., off Martha's Vineyard, 410 fath.; Verrill, Tr. Conn. Ac. v. p. 535, the former figured in woodcut; also in P. U. S. Nat. Mus. v. p. 334.

RHIPIDOGLOSSA.

Neritinidæ.

Neritina fulgetrum (Reeve) from Madagascar; E. A. Smith, P. Z. S. 1882, p. 387, pl xxii. figs. 23 & 24.

Neritina wallacii (Dohrn) figured by Schepman, Tijdschr. Nederl. Dierk. Ver. vi. p. 20, pl. ii. fig. 4.

Neritina rangiana (Souv.), var. from Aden; Ancey, Le Nat. 1882, p. 68.

[illegible]icella. Monograph by the Recorder finished in Küster's Conch. [illegible]. 315, pp. 41–56, pls. vii. & viii.; description of *N. reticulata* (Rv.) and [illegible]ens (Recl.), with several varieties, figures of the same and of *N.* [illegible] Recl.) and *tessellata* (Lam.), and geographical distribution.

Trochidæ.

Radula of *Turbo smaragdus* (Martyn), *Anthora tiarata* (Q. & G.), *Zizyphinus punctulatus* (Martyn), *Cantharidus texturatus* and *pupillus* (Gould), *huttoni* (Smith), and ? *tenebrosus* (A. Ad.), Hutton, Tr. N. Z. Inst. xiv. pp. 165 & 166, pl. vii. figs. G–N.

Turbo filosus (Phil.) var. *glabrata* (Phil., *Trochus*) in the recent state,

Mediterranean, 217 fath., operculum shelly ; Jeffreys, Ann. N. H. (5) x. p. 31.

Uvanilla heimburgi, sp. n., Dunker, Moll. Jap. p. 130, pl. vi. figs. 6 & 7, Japan.

Collenia rubra and *purpurascens*, spp. nn., *id. l. c.* pp. 128 & 129, pl. xii. figs. 1–3 & 7–9, Japan.

Cyclostrema dalli, sp. n., Verrill, Tr. Conn. Ac. v. p. 532, pl. lvii. fig. 39, and P. U. S. Nat. Mus. v. p. 333, New England, 487 fath.

Trochus vaillanti, sp. n., Fischer, Rapp. Faune sous-marine, p. 43, and J. de Conch. xxx. p. 50, Coast of Portugal, 1224 metres.

Trochus ottoi (Phil.) and *wiseri* (Calcara) = *gemmulatus* (Phil.), in the recent state, Mediterranean, 214–970 fath. ; Jeffreys, Ann. N. H. (5) x. p. 31.

Oxystele kaneni, sp. n., Dunker, Moll. Jap. p. 142, pl. xii. figs. 4–6, Japan.

Euchelus smithi, sp. n., *id. l. c.* p. 259, pl. vi. figs. 16–19, Japan.

Huttonia, g. n. : distinguished from *Euchelus* by the deep notch at the anterior end of the columella. For *Euchelus bellus*, Hutton, and *H. iricolor*, Waikanae, and *H. hamiltoni*, Wellington, spp. nn. ; Kirk, Tr. N. Z. Inst. xiv. pp. 282 & 283.

Zizyphinus folini, sp. n., Algeria, 900 metres, and *suturalis* (Philippi, known hitherto only as fossil), Mediterranean Coast of Morocco ; Fisher, Rapp. Faune sous-marine, p. 44, and J. de Conch. xxx. p. 50.

Calliostoma bairdi (Verrill & Smith, 1880), south of Martha's Vineyard, 65–192 fath., living animal figured ; Verrill, Tr. Conn. Ac. v. p. 530, pl. lvii. fig. 26.

Enida japonica (A. Ad.), Dunker, *l. c.* p. 144, pl. xii. figs. 17 & 18, Japan.

Trochus (*Solariella*) *lusitanicus*, sp. n., Fischer, J. de Conch. xxx. p. 51, Coast of Portugal, 307 metres.

Margarita regalis and *lamellosa* (Verrill & Smith, 1880), Verrill, Tr. Conn. Ac. v. 2, p. 530, pl. lvii. figs. 37 & 38, New England.

Macharoplax obscura var. *bella* (Verkrüz.), and varr. nn. *planula* and *carinata*, New England, 43–335 fath., *id. l. c.* pp. 521 & 522.

Macharoplax hidalgoi, sp. n., Fischer, Rapp. Faune sous-marine, p. 43, and J. de Conch. xxx. p. 51, Gulf of Gascony, 896–1226 metres.

Umbonium adamsi, sp. n., Dunker, Moll. Jap. p. 135, pl. vi. figs. 3–5, Japan.

Haliotididæ.

Pleurotomaria, enumeration of the 4 hitherto known recent [illegible] and remarks on most of the known specimens having been inhabited by hermit crabs, the similarity of colour in all, &c. ; Crosse, J. de Conch. xxx. pp. 1–22. *P. adansoniana* (Crosse & Fischer), pl. l., compared with *rumphi* (Schepman), *id. l. c.* pp. 183 & 184, the latter figured by Schepmen, Tijdschr. Nederl. Dierk. Ver. vi. p. 23, pl. ii. figs. 1–3.

Haliotis (L.). 71 species described and figured by Sowerby, Thesaurus, v. pts. 37 & 38, pp. 17–37, pls. ccccxxviii.–ccccxl. *bis*, including *H.*

hanleyana, sp. n., p. 26, pl. ccccxxxi. fig. 28, locality unknown, *alternata* sp. n., p. 23, pl. ccccxxxv. fig. 51, Malta, Gibraltar, Mozambique[?], *grayana* new name for *marmorata* (Gray, *nec* Linn.), p. 20, pl. ccccxxxviii. fig. 87, pl. ccccxl. *b*, fig. 111, locality unknown, *echinata*, sp. n., p. 18, pl. ccccxl. *b*, fig. 124, locality unknown; the last, according to the author himself, quite possibly the unworn young state of *H. gigantea*.

Haliotis exigua (Dkr.), Dunker, Moll. Jap. p. 148, pl. vi. figs. 8–10, Japan.

Fissurellidæ.

Emarginula multistriata, sp. n., Jeffreys, Ann. N. H. (5) x. p. 30, Mediterranean, 217 fath., and Western Coast of Spain, 292–374 fath.

Puncturella (Lowe), *Cranopsis* (A. Ad.), *Rimula* (Defr.), and *Semperia* (Crosse), differentiated by P. Fischer, J. de Conch. xxx. p. 278.

Puncturella clathrata, sp. n., and *profundi* (Jeffr., 1877), Atlantic, 'Porcupine' Expedition, Jeffreys, P. Z. S. 1882, pp. 675 & 676, pl. l. figs. 10 & 11.

Rimula asturiana, sp. n., Fischer, Rapp. Faune sous-marine, p. 43, and J. de Conch. xxx. p. 51, Gulf of Gascony, 1107–2018 metres; identified with *Puncturella* (*Cranopsis*) *crabicia* (Fischer) by Jeffreys & Watson, *l. c.* p. 277.

Fissurisepta granulosa, sp. n., Jeffreys, P. Z. S. 1882, p. 675, pl. l. fig. 9, Atlantic, 'Porcupine' Expedition.

Fissurella tanneri, sp. n., Verrill, P. U. S. Nat. Mus. v. p. 333, off Delaware Bay, 104 fath.

Fissurella melvilli, sp. n., Sowerby, P. Z. S. 1882, p. 120, pl. v. fig. 11, locality unknown.

Cocculina, g. n. Shell resembling that of *Patella*, but no eyes, only one asymmetrical gill; dentition closely resembling that of *Parmophorus* and *Helicina*; the internal and external anatomy also present a curious mingling of features supposed "to be characteristic of the *Docoglossa* and the *Rhipidoglossa*." *C. rathbuni* and *beani*, spp. nn., off Martha's Vineyard, South Coast of New England, 100–416 fath., also off the West Indies, 399–502 fath., 'Porcupine,' Expedition, Dall, P. U. S. Nat. Mus. iv. p. 402, and v. p. 334; Ann. N. H. (5) x. pp. 12–16; also Verrill, Tr. Conn. Ac. v. p. 533. The author proposes a new family, *Cocculinidæ*, for it.

[illegible]culina spinigera, sp. n., Jeffreys, P. Z. S. 1882, p. 683, between the [illegible]des and Færöes, 516 fath., commensal with *Idas argenteus* on deserted [illegible]f *Teredo*.

DOCOGLOSSA (CYCLOBRANCHIA).

W. H. Dall treats on the dentition of this Order generally, taking as typical that of the *Patellidæ*, with three lateral and three marginal plates on each side; this number is reduced in the *Acmæidæ* and *Lepetidæ* either by suppression or coalescence of some plates, so that the three lateral plates seem to be soldered into one in *Pectinodonta*, and even those of both

sides into one unpaired plate in *Lepeta*, while in the latter two, in *Lepetella* one, and in *Pectinodonta* no marginal plates are developed. He gives an analytical table of all known genera with their dental formula, dividing this Order as follows :—

Sub-Order *Abranchiata*, no external branchiæ; embryonic shell spiral. Only family *Lepetidæ*, subfamily *Lepetinæ*, gen. *Lepeta*, Gray, including *Pilidium* (Forb.) and *Cryptobranchia* (Midd.), and subfam. *Lepetinellinæ*, gen. *Lepetella*, Verr.

Sub-Order *Protobranchiata*, external branchiæ; embryonic shell conical.

Fam. *Acmæidæ*, a plumose cervical branchia; no rhachidian tooth; gen. *Pectinodonta*, *Scutellina*, *Acmæa*, *Collisella*, *Lottia*, *Scurria*.

Fam. *Patellidæ*, no cervical branchia, but a cordon of branchial lamellæ on both sides.

(*a*) Branchial cordon complete; gen. *Ancistromesus*, with a rhachidian tooth; *Patella*, *Patinella*, and *Nacella* without it.

(*b*) Branchial cordon interrupted in front; gen. *Helcion*, *Helcionisicus*, and *Patina*, all without rhachidian tooth.

P. U. S. Nat. Mus. iv. (April, 1882) pp. 411–414; abstract in Ann. N. H. (5) x. pp. 24–26.

Acmæidæ.

Tectura (Milne-Edwards) has priority over *Acmæa* (Esch.); *T. rugosa*, *pusilla*, *adunca*, and *galeola*, spp. nn., Jeffreys, P. Z. S. 1882, pp. 671 & 672, pl. l. figs. 2–5, Atlantic 'Porcupine' Expedition.

Patella solandri (Colenso, Tasm. J. of Nat. Sc. ii. [1841 ?]), Tokomara Bay, North Island of New Zealand, Colenso, Tr. N. Z. Inst. xiv. p. 168; = *Acmæa fragilis* (Chemn.), Kirk, N. Z. J. Sci. i. p. 213.

Pectinodonta, g. n. Allied to *Scutellina*, blind, dentition composed of one large pectinate lateral plate on each side of the median line. *P. arcuata*, sp. n., Dall, P. U. S. Nat. Mus. iv. p. 409, St. Thomas and Sta. Lucia, West Indies, 226 fath.; Ann. N. H. (5) x. pp. 21 & 22.

Lepetidæ.

Propilidium scabrosum, *pertenue*, and *compressum*, spp. nn., Jeffreys, P. Z. S. 1882, p. 674, pl. l. figs. 6–8, Mediterranean and Atlantic, 'Porcupine' Expedition.

Lepetella tubicola, Verrill & Smith, Am. J. Sci. (3) xx. [1880], Dall; P. U. S. Nat. Mus. iii. p. 375 and iv. p. 408. Shell and anatomy in *Lepeta*, but eyes distinct, radula provided with true lateral teeth, scale-shaped uncini; nucleus of the shell subspiral. Dall proposes a new subfamily, *Lepetellinæ* for it. Found in old tubes of *Hyalinœcia*, off Martha's Vineyard, South of Cape Cod; Verrill, Tr. Conn. Ac. v. p. 534.

[This genus was by mistake wrongly placed in the *Cerithiopsidæ* in the preceding Record, *Moll.* p. 46.]

CHITONIDÆ.

B. HALLER gives an elaborate anatomy of two species of *Chitonidæ*, *Chiton siculus* (Gray) and [*Acanthochætes*] *fasciicularis* (L.), describing more particularly the nervous system, the intestinal tract and its glands (of which he calls one the "sugar gland," because its secretion changes amylon into sugar; this is the "pharyngeal sac" of former authors), the renal organ, the sexual organs, and the blood vessels. He dwells on the relations of the body cavity to the internal organs; the intestine is supported by a mesenterium only in its last part, the genital gland is fixed by an anterior and posterior ligament, and the author comes to the conclusion that the body cavity is originally formed by right and left parts, into which the organs have been invaginated; the pericardium and the ligaments of the genital gland being formed originally by the epithelial layer of the body cavity. As to the relations of the *Chitonidæ* to *Neomenia*, the author thinks that both are collateral groups, the arrangement of the nervous ganglions being more primitive in the *Chitonidæ* than in *Neomenia*, though many other points of the organization are reversed. Arb. z. Inst. Wien, iv. 3, pp. 323–395 (1–74), with 7 pls.

A. SEDGWICK states that in *Chiton discrepans* (Leach), and *cancellatus* (Leach) the kidney is a paired, unsegmented, reflexed gland with paired openings into the pallial groove and pericardium, and agreeing closely with that of *Anodonta*; but it is beset by a number of branched globular cœca, lying in the hinder part of the body cavity, and forming a mass of tubes apparently interlacing with those of the opposite side; this portion has been seen and described by Von Ihering as an unpaired kidney opening to the exterior by a median pore; the generative gland is unpaired and dorsal, its ducts paired and opening into the pallial groove between the 13th and 14th gill. P. R. Soc. xxxiii. pp. 121–127, with 2 woodcuts; abstract in J. R. Micr. Soc. (2) ii. pp. 179 & 180.

KOWALEWSKY's paper on the development of *Chiton*, Zool. Anz. 1882, pp. 307–310; see General Subject.

All the generic divisions recognized by the late P. P. Carpenter & W. H. Dall, recent and fossil, are brought together and their chief characteristics tabulated, and many generic names proposed by former authors are restricted or better characterized; DALL, P. U. S. Nat. Mus. iv. pp. 279–291. The following observations occur:—

[illegible]*toplax*, *Callistoplax*, and *Angasia* (Carpenter, 1879) characterized,

[illegible]*ozona*, pp. 283 & 286, new name for *Ceratophorus* (Carp., *nec* [illegible]).

[illegible]*ochiton*, pp. 283 & 287, new name for *Hemphillia* (Carp., *nec* Binney).

Fannettia, pp. 284 & 287, new name for *Fannia* (Gray, *nec* Desvoidy).

Lucilina, pp. 284 & 287, new name for *Lucia* (Gould, *nec* Swainson).

Middendorffia (Carp. MS.), pp. 284 & 287, new name for *Dawsonia* (Carp., preoccupied).

Beanella, ibid., new name for *Beania* (Carp., *nec* Johnstone).

Species of *Chitonidæ* found in deep water on the American Coast, enumerated by W. Dall, P. U. S. Nat. Mus. iv. pp. 410 & 411, and Am. N. H. (5) x. p. 23.

Chiton rarinota, sp. n., Jeffreys, P. Z. S. 1882, p. 668, Atlantic, 'Porcupine' Expedition.

Placophora (*Euplacophora*) *atlantica*, sp. n., Verrill & Smith, Am. J. Sci. (3) xxiv. p. 365, South Coast of New England.

[SOLENOGASTRA.]

A. A. W. Hubrecht gives a brief account of the organization of *Neomenia*, *Proneomenia*, and *Chætoderma* compared with that of *Chiton* and *Chitonellus*, with several diagrammatic figures; Q. J. Micr. Sci. xxii. pp. 212–218.

Neomenia. Kowalewsky & Marion, in a preliminary account of their researches upon this genus, express an opinion that what has been hitherto considered as the hinder end is really the anterior, and what has been described as the penis is the radula; Zool. Anz. 1882, pp. 61–64. Hubrecht opposes this view, and thinks that the animals observed by the two authors belong to the genus *Proneomenia*, not to *Neomenia*; tom. cit. pp. 84–86, also in Arch. Z. expér. x. pp. xxxiii.–xxxvii.

Neomenia coralliophila, sp. n., described by A. Kowalewsky, Nachr. Ges. Mosc. xliii.

Proneomenia. Note by Hubrecht, Rep. Brit. Ass., 51st meeting, p. 673.

TECTIBRANCHIA.

Actæonidæ.

Actæon nitidus, sp. n., = *Auriculina insculpta* (Verrill, 1880, *nec* Montagu, sp.), Verrill, Tr. Conn. Ac. v. p. 540, pl. lviii. fig. 21, South of Martha's Vineyard, South Coast of New England, 312–487 fath.

Actæon giganteus, sp. n., Dunker, Moll. Jap. p. 160, pl. ii. figs. 8 & 9, Japan.

Buccinulus fraterculus, sp. n., *id. l. c.* p. 161, pl. xiii. figs. 21–23, Japan.

Ringicula cabrai, Red Sea ?, *senegalensis*, Coast of Senegal, 72 m[illegible]s, *admirabilis* and *schlumbergeri*, Mediterranean, spp. nn., Morlet, Conch. xxx. pp. 201–204, pl. ix. figs. 1–4.

Choristidæ.

Choristes elegans (Carpenter, 1872, post-pliocene fossil in Canada), found in the recent state off Martha's Vineyard, South Coast of New England, 255 fath. Verrill proposes a new family for it, characterized by the heliciform shell, with the periostracum continuous between the whorls; lip continuous, columella without a fold; operculum paucispiral. Animal with frontal tentacles united by a fold and with simple posterior

tentacles; jaws well developed; radula with three rows of rhachidian teeth, broad bilobed inner lateral teeth, and two rows of small hook-shaped outer lateral teeth; eleven teeth in one row; gill large, attached to the inner surface of the mantle on the left side of the neck, and extending over to right side, consisting of numerous lamellæ. A perfect, but small specimen, 6 mm. long. Tr. Conn. Ac. v. pp. 540–542, pl. lviii. fig. 27, radula, fig. 27*a*, and P. U. S. Nat. Mus. v. pp. 337 & 338.

Bullidæ.

Cylichna semisulcata, sp. n., Dunker, Moll. Jap. p. 163, pl. xiii. figs. 7–9, Japan.

Cylichna ? dalli, sp. n., Verrill, Tr. Conn. Ac. v. 542, and P. U. S. Nat. Mus. v. p. 336, New England, 335 & 266 fath.

Diaphana gemma (Verrill, 1880), New England; *id. l. c.* p. 543, pl. lviii. fig. 22.

Hydatina inflata (Dkr.); Dunker, *l. c.* p. 162, pl. ii. figs. 14–16, Japan.

Philine amabilis (Verrill) and *tincta*, sp. n., Verrill, *l. c.* p. 544, the former, pl. lviii. figs. 23 & 24, the latter also P. U. S. Nat. Mus. v. p. 337, New England.

Aplysiidæ.

Notarchus punctatus (Phil.). A nearly microscopical internal shell, 1 mm. long, found in it by A. Vayssière, J. de Conch. xxx. pp. 271–273.

Aplysia hamiltoni, sp. n., Kirk, Tr. N. Z. Inst. xiv. p. 283, Napier.

Pleurobranchidæ.

Umbrella and *Tylodina*: nucleus spiral and heterostrophic; Jeffreys, P. Z. S. 1882, p. 673.

Pleurobranchæa tarda (Verrill, 1880), New England; Verrill, Tr. Conn. Ac. v. p. 546, pl. lviii. fig. 26.

Koonsia, g. n. Head, tentacles, proboscis, and gill as in *Pleurobranchæa*. Back swollen and overhanging with a distinct mantle-edge all round; foot narrow, prolonged posteriorly, with a glandular groove near the end beneath, and a conical papilla above, near the tip; verge armed with small hooks. *K. obesa*, sp. n., off Martha's Vineyard, 216–258 fath., and off Delaware Bay, 312 fath.; Verrill, Tr. Conn. Ac. v. (July, 1882) p. 545, and P. U. S. Nat. Mus. v. pp. 338 & 339.

NUDIBRANCHIA.

Doridide.

Doris complanata (Verrill, 1880), New England; Verrill, Tr. Conn. Ac. v. p. 549, pl. lviii. fig. 34.

Doris wellingtonensis (Abraham) radula; Hutton, Tr. N. Z. Inst. xiv. p. 166, pl. vi. fig. 6.

Doris luctuosa, sp. n., T. F. Cheeseman, Tr. N. Z. Inst. xiv. p. 213, Auckland Harbour.

Heterodoris robusta, sp. n., Verrill & Emerton, Tr. Conn. Ac. v. p. 54[illegible] pl. lviii. fig. 35, dentition fig. 35 *a*, *b*, New England.

Doridopseidæ.

Doridopsis mammosa, Abraham (1877), identified from Mongonui on *Zostera*, and redescribed by T. F. Cheeseman, Tr. N. Z. Inst. xiv. p. 214.

Polyceridæ.

Issa lacera (Müll.) and *ramosa* (Verrill, 1880), New England; Verrill, Tr. Conn. Ac. v. p. 547, pl. xlii. fig. 11, and pl. lviii. fig. 36, dentition fig. 36*a*.

Tritoniidæ.

Scyllæa edwardsi (Verrill, 1878), New England: attached to *Zostera* and *Sargassum*; Verrill, Tr. Conn. Ac. v. p. 550, pl. xlii. fig. 10.

Æolidiæ.

S. Trinchese is publishing a splendid work on the *Æolidiæ* of Genoa, with beautiful coloured plates. The Recorder has hitherto seen only the parts indicated above in the list of authors; the contents of the first will be mentioned here.

Æolis plicata, sp. n., New Zealand, and *corfii* (Hutt.), and radula of both; Hutton, Tr. N. Z. Inst. xiv. p. 166, pl. vi. fig. E, F, J, K.

Caliphylla tricolor (Trinchese) and *mediterranea* (Costa); Trinchese, Æolid. i. pls. i.-iv., whole animal and anatomical particulars.

Coryphella nobilis and *stimpsoni* (Verrill), New England; Verrill, Tr. Conn. Ac. v. p. 552, pl. xlii. figs. 14 & 15.

Fiona nobilis (Ald. & Hanc.), specimens from New England described; *id. l. c.* p. 551.

Tergipes doriæ and *capellinii* (Trinchese); Trinchese, *l. c.* pls. xxiv.-xxvii.

Galvina picta (Ald. & Hanc.) and *flava* (Trinch.); *id. l. c.* pls. xxviii.-xxxi.

Amphorina alberti (Quatref.) and *cærulea* (Montagu); *id. l. c.* pls. xxx., xxxii. & xxxiii.

Acanthopsole (Trinch., 1871) *rubro-vittata*, Costa; *id. l. c.* pls. xxxiv. & xxxv.

Ercolania pancerii, *siottii*, and *uziellii* (Trinchese); *id. l. c.* pls. v.-xiv.*a*, whole animal; anatomy chiefly of the second species.

Placida tardii, *viridis*, *brevirrhina* (Trinchese); *id. l. c.* pls. xv.-xviii.

Hermæa dendritica (Ald. & Hanc.) and *brevicornis* (Costa); *id. l. c.* pls. xix. & xx.

Hermæina maculosa (Trinchese); *id. l. c.* pls. xxi.-xxiii.

Limapontiidæ.

Rhodope veranii, first described as a Mollusk by Kolliker, in 1867, = *Sidonia elegans* (M. Schultze), described as *Turbellaria*; it has no heart, blood-vessels, gills, renal organ, or radula analogous to that of the *Mollusca*; but, on account of the infra-œsophageal commissure of the central nervous ganglions, its otocysts being ciliated inside, and the lateral opening of its genital organs, is to be considered as a low form of Gastropods. L. v. Graff, Morph. JB. viii. pp. 73–84, pl. ii. R. Bergh, on the contrary, thinks it better placed with *Turbellaria*; Zool. Anz. 1882, pp. 550–553.

PULMONATA.

J. Wood-Mason (P. A. S. B. 1882, pp. 61–64) subdivides the Stylommatophorous *Pulmonata* as follows :—

1. *Craspedophora*, possessing a ciliated peripodium (*suprà*, Generalities).
   (*a*) A peripodial pit at its posterior extremity: *Arion*, *Geomalacus*, *Dendrolimax*, *Cryptosoma*, *Austenia*, *Tennentia*, *Parmarion*, *Girasia*, *Helicarion*, *Nanina*, *Microcystis*, *Macrochlamys*, *Sitala*, *Ariophante*, *Rotula*, *Euplecta*, *Eurypus*, *Martensia*, *Macroceros*, *Xesta*, *Rhysota*, *Ventridens*, ? *Thalassia*, *Sesara*, *Durgella*, *Odontoprion*, ? *Caldwellia*, and *Ferussacia*.
   (*b*) Peripodial pit absent: *Limax*, *Oopelta*, *Parmacella*, *Anadenus*, *Philomycus*, *Vitrinopsis*, *Vitrinoconus*, *Vitrina*, *Hyalina*, *Gastrodonta*, *Trochomorpha*, *Plectopylis*, *Videna*, &c.
2. *Lipocraspeda*. No distinct peripodium. The families *Helicidæ* [including also *Succinea*, *Orthalicus*, *Clausilia*, *Pupa*, &c.], *Testacellidæ*, and *Vaginalidæ*.

[The first group, with peripodial pit, coincides essentially with the family *Arionidæ*, as proposed by Gray in the Catalogue of *Pulmonata* of the British Museum, 1855, pp. 3 & 51, or the *Phorepora* of Desmoulins, Act. Soc. L. Bord. iii. 1824.—Rec.]

On ovo-viviparous inoperculate land snails; Rochebrune, Bull. Soc. Philom. (7) vi. pp. 219–225.

Agnatha.

Trigonochlamys imitatrix (Böttg.), pharynx and radula described, jaw smooth, radula of the type of the *Testacellidæ*; *Mabillea* (Bourg., 1877) is also probably nearly allied to it. Hesse, JB. mal. Ges. ix. pp. 29–32, pl. ii. figs. 1*a*–1*e*.

Testacella maugei (Fér.). J. Darker Butterell describes its method of swallowing a worm after transfixing it by the extruded odontophore (radula); J. of Conch. iii. p. 277.

Daudebardia rufa (Dr.), *hassiaca* (Clessin), and *brevipes* (Dr.), note on their occurrence near Cassel; Diemar, Nachr. mal. Ges. 1882, pp. 44–46 & 89–91. Some species figured by Kobelt; Rossm. Iconogr. (2) i. pl. i.

Daudebardia novoseelandica (Pfr.), no jaw, teeth of the radula needle-shaped, with a central process of attachment, in oblique rows; Hutton, Tr. N. Z. Inst. xiv. p. 152, pl. iii. fig. E, and pl. iv. fig. M.

Paryphanta busbii (Gray), no caudal gland, no jaw, teeth needle-shaped, with middle prominence, in oblique rows; *id. l. c.* p. 153, pl. iv. figs. A & L. [This snail must therefore, in future, be placed among the *Agnatha* or *Testacellidæ*.—REC.]

Pseudosubulina, g. n. Shell resembling that of *Subulina*, distinctly costulated; apex globular; no solid jaw, teeth of the radula needle-shaped, as in the *Testacellidæ*, median tooth rudimentary. Not ovo-viviparous. *P. berendti* (Pfr., *Achatina*), Mexico, and probably also *chiapensis* (Pfr.); shells of both described and figured by Strebel, Mexik. Land-conch. v. pp. 117–119, pl. vii. figs. 7 & 17; anatomy of the former by Pfeffer, *ibid.* pl. xviii. figs. 5–8 & 23.

Ennea splendens, sp. n., Von Möllendorff, JB. mal. Ges. ix. p. 183, Prov. Quan-tung, China.

Ennea martensi, sp. n., near *insignis* (Pfr.), West Africa, and *dohrni*, new name for *monodon* (Martens, 1876, *nec* Morelet); E. A. Smith, J. of Conch. iii. pp. 301 & 302. *Ennea dohrni*, sp. n., *E. filicosta* (Morelet, as *Carychium*); Martens, JB. mal. Ges. ix. p. 247, Angola [somewhat later in date of publication].

Ennea glabra, *diodon*, *brevicula*, *oryza*, *costellata*, and *vermis*, spp. nn., Morelet, J. de Conch. xxx. pp. 189–193, pl. x. figs. 5, 6, 8, 9, 13, & 14, Mayotte Island, Comores.

Gibbulina (*Gonidomus*) *mauritiana* (Morel.), probably only a variety of *modiolus* (Fér.), *palanga* (Fér.), a more cylindrical variety, and questions of nomenclature concerning *G. versipolis* (Fér.) and *palangula* (Morelet); *id. l. c.* pp. 96–98.

Streptaxis regius and *dunkeri* var. *clausa* (Löbbecke, 1881); Löbbecke, JB. mal. Ges. ix. pp. 3 & 4, pl. i. figs. 3 & 4.

Streptaxis borealis, sp. n., Heude, Moll. terr. Fl. Bleu, p. 79, pl. xviii. fig. 26, Province Nganhwei, China.

OXYGNATHA.

Analytical key to the genera of *Arionidæ* and *Limacidæ*, by Godwin-Austen, Land and Freshw. Moll. of India, ii. pp. 64 & 65.

Limax, critical notes on some species; Heynemann, Nachr. mal. Ges. 1882, p. 127.

Limax maximus (L.) and *cinereus* (Lister), varieties in colour, and variation in the presence of a lateral point in the lateral teeth; Esmark, N. Mag. Naturv. xxvii. pp. 82, 92, & 93. *L. agrestis* (L.), abnormal double-pointed median tooth, p. 89, fig. 1.

Lehmannia marginata (Müll.); in young specimens, all teeth of the radula are provided with lateral points, whereas in full grown the lateral point is only present in the marginal teeth; also the number of teeth in one transverse row is smaller in young specimens. *Id. l. c.* pp. 94–96, figs. 3–5.

Limax variegatus (Dr.), specimens from Epirus, and *L. conemenosi*, sp. n., Prevesa; Böttger, Nachr. mal. Ges. 1882, p. 99.

Limax variegatus (Dr.), also from Chile; Heynemann, Nachr. mal. Ges. 1882, p. 186.

Limax eustrictus (Bourg.), dentition; *id. l. c.* p. 129, woodcut.

Limax genei, *perosinii*, and ? *melitensis*, spp. nn., Lessona & Pollonera; Mem. Acc. Tor. (2) xxxv., Italy.

Limax molestus (Hutt.) = *agrestis* (L.), jaw and radula figured; Hutton, Tr. N. Z. Inst. xiv. p. 154, pl. iii. figs. H & P.

Agriolimax panormitanus, sp. n., Lessona & Pollonera, *l. c.*, Sicily.

Amalia tyrrhena, *insularis*, *dæderleini*, *sicula*, and *ichnusæ*, spp. nn., *iid. l. c.*, Italy.

Amalia kobelti, sp. n., Hesse, Nachr. mal. Ges. 1882, pp. 95 & 316, and JB. mal. Ges. ix. pl. xii. fig. 1, Greece. *A. hessii*, sp. n., Böttger, Nachr. mal. Ges. 1882, p. 96, Corfu.

Milax antipodum (Gray), and *emarginatus* (Hutt.), jaw and radula; Hutton, Tr. N. Z. Inst. xiv. p. 156, pl. iii. figs. G, L, Q, & S, pl. iv. fig. S.

Urocyclus (Gray). Anatomical and critical notes concerning it; jaw oxygnath, median and lateral teeth of the radula tricuspidate, marginal teeth bicuspidate; *Parmarion flavescens* (Keferst.) and probably also *Dendrolimax* (Heynem.) belong to this genus. *U. comorensis*, *vittatus*, and *longicauda*, spp. nn., the two former from Mayotte Island, the last from Nossi-comba. P. Fischer, J. de Conch. xxx. pp. 261–271, pls. 11 & 12.

Dendrolimax martensi, sp. n., Usambara, E. Africa, and note on *Urocyclus buchholzi* (Martens); Heynemann, Nachr. mal. Ges. 1882, pp. 182–184.

Vitquesnelia atlantica (Morel.), described by F. d'Arruda Furtado, J. Sci. Lisb. 1882, pp. 305–309, pl.

Vitrina alpestris (Clessin), animal and dentition described, the latter compared with those of *elongata*, *diaphana*, *brevis*, and *pellucida*; Clessin, Mal. Bl. (2) v. pp. 153 & 154.

Vitrina, table of 7 species living on the Azores; Furtado, Ann. N. H. (5) ix. p. 397.

Vitrina sinensis, sp. n., Heude, Moll. terr. Fl. Bleu, p. 11, pl. xiii. fig. 5, Ning-kow, Middle China.

Vitrina conquisita and *riepiana*, spp. nn., Jickeli, JB. mal. Ges. ix. p. 366, Habab, N. E. Africa.

Vitrina madagascariensis, sp. n., E. A. Smith, P. Z. S. 1882, p. 379, pl. xxi. figs. 6 & 7, Central Madagascar.

Helicarion (Fér.), note on the anatomy of an Australian species; Godwin-Austen, Land and Freshw. Shells of India, p. 65.

Helicarion sinense [*-sis*], sp. n., Heude, Moll. terr. Fl. Bleu, p. 11, pl. xiii. fig. 4, Mountains of Middle China.

Cryptosoma (Theobald, 1857), *præstans* (Gould), living animal, radula, and genital organs described and figured; Godwin-Austen, *l. c.* pp. 14–17, pl. iv.

G. Pfeffer, Abh. Ver. Hamb. vii. pt. 2 (1882), arranges the snails which were formerly united in the genus *Nanina* from an anatomical point of view as follows:—

Sub-family *Naninine* [= *Naninidæ*, Zool. Rec. xv. *Moll.* p.

I. Series *Macrochlamys–Parmarion*. Mantle-lobes much develop… shell more or less reduced, in some genera internal.

Macrochlamys (Bens.), including *sogdiana* and *turanica* (Martens), *splendens* (Hutt.), *honesta* (Gould, Semper, *nec* Stoliczka), and *resplendens* (Troschel).

Helicarion, Fér., subg. s. str., jaw toothed, radula typical. *H. suturalis* and *plicatulus* (Martens), *cuvieri* (Fér.), *permollis* (Stoliczka), and some other species anatomically described by C. Semper.

Zonitarion, subg. n. (name only, 1878), jaw without tooth, teeth of the radula in overlapping rows, their sides flattened. *Z. semimembranaceus* (Martens) and *resiliens* (Beck).

Dendrolimax (Dohrn), *Parmarion* (Fischer), *Tennentia* (Humbert), and *Urocyclus* (Gray); *Parmarion pupillaris* (Fischer) and *Urocyclus flavescens* (Keferstein) are also described.

II. Group of the genus *Xesta*. Either the mantle-lobes or the tripartite quality of the foot or both reduced, sometimes obsolete.

Xestina (Pfeffer, 1878); *H. politissima* (Pfr.) may belong to it.

Xesta (Albers); *X. citrina* (L.), *limbata* (Martens), *vitellus* (Shuttl.), *fulvizona* (Mouss.), *wallacii* (Pfr.), and *distincta* (Pfr.).

Ariophanta (Desmoul.), no cœcal appendages at the penis; the lines of growth in the shell form a much more acute angle with the suture than in *Xesta*. *A. lævipes* (Müll.), *cidaris* (Lam.), *explanata* (Q. & G.), *martini* (Pfr.).

Hemiplecta (Albers); *H. isabellina* (Pfr.), *siamensis* (Pfr.), *setigera* (Sow.), *gummata* (Pfr.).

Rhysota (Albers).

Euplecta (Semper); *E. subopaca* (Pfr.), *layardi* (Pfr.), *subconoidea* (Pfr.).

III. The genus *Eurypus* (Semper) is distinct by a very small flagellum, and the absence of glandulæ mucosæ. *E. hoyti* (Garr.) and *cascus* (Gould).

IV. Series *Thapsia–Lamprocystis*. No glandulæ mucosæ; cœcal appendages gradually disappearing.

Thapsia (Albers); *T. calamechroa* (Jonas), *chrysosticta* (Morelet) [= *mechowi*, Dohrn], *indecorata* (Gould), *renitens* (Morelet); *T. troglodytes* (Morelet) is anatomically somewhat different from the rest.

Lamprocystis, g. n., = *Microcystis* of most authors, not of Beck, whose first species are American; mantle lobes more or less reduced; jaw with a feeble median tooth; ovo-viviparous. *L.* (*M.*) *excrescens* (Mouss.), *firmostyla* (Mouss.), *perpolita* (Mouss.), *myops* (Semper), *succinea* (Pfr.).

V. Series of *Trochonanina*, characterized by the want of a true retractor of the penis, but provided with an appendicular gland. Self-fecundation in some of them.

Martensia; *M.* (Semper), *mossambicensis* (Pfr.).

Inozonites, g. n. Mantle lobes complete; genital organs very

Sub-family *Naninine* [= *Naninidæ*, Zool. Rec. xv. *Moll.* p.

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Macrochlamys (Bens.), including *sogdiana* and *turanica* (Martens), *splendens* (Hutt.), *honesta* (Gould, Semper, *nec* Stoliczka), and *resplendens* (Troschel).

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V. Series of *Trochonanina*, characterized by the want of a true retractor of the penis, but provided with an appendicular gland. Self-fecundation in some of them.

Martensia; *M.* (Semper), *mossambicensis* (Pfr.).

Inozonites, g. n. Mantle lobes complete; genital organs very

simple, only a terminal glandular sac at the penis, which is connected by a muscle with the uterus. *Helix filo-cincta* (Pfr.), Philippines.

Trochonanina (Mouss.); *T. radians* (Mouss.), and *schmeltziana* (Mouss.).

Trochozonites, g. n. One or two mantle lobes; cavity of the penis communicating with the oviduct, but apparently without external orifice. (Arch. f. Nat. 1878, pp. 422 & 423.) West African. *T. percarinatus* (Martens) and *ibuensis* (Pfr.).

The author has made anatomical researches on the species which are here mentioned.

Oxytes blanfordi (Theob.) and *koondaensis* (Blanf.), figures of living animal; Godwin-Austen, J. A. S. B. li. pt. 2, p. 69, pl. v. figs. 1 & 2.

Rhyssota conferta (Pfr., 1858) = *haughtoni* (Bens., 1863), figure of living animal; *id. l. c.* p. 70, pl. v. fig. 6.

Bensonia mainwaringi (Nev.), figure of living animal; *id. l. c.* p. 69, pl. v. fig. 3.

Nanina hildebrandti, *anobrachys*, *eos*, *thalia*, *hestia*, *basalis*, spp. nn., Dohrn, JB. mal. Ges. ix. pp. 370–377, Madagascar. *Helix* (*Nanina*) *cleamesi*, sp. n., E. A. Smith, P. Z. S. 1882, p. 379, pl. xxi. figs. 8 & 9, Central Madagascar.

Nanina erratica, *fuchsiana*, *microgyra*, and *clausa*, spp. nn., Heude, Moll. terr. Fl. Bleu, pp. 12–14, pls. xiii. figs. 3, 8, & 10, and xix. fig. 6, Middle China.

Macrochlamys cincta, sp. n., Von Möllendorff, JB. mal. Ges. ix. p. 183, Isl. Hainan.

Macrochlamys tugurium (Bens.), figure of living animal; Godwin-Austen, J. A. S. B. li. pt. 2, p. 69, pl. v. fig. 4.

Euplecta ornatissima and *camura* (Bens.), *crossii* (Pfr.), and an undetermined species, figures of living animals; *id. l. c.* p. 70, pl. v. figs. 5, 7, 8 & 10.

Kaliella barrakporensis (Pfr.) = *sivalensis* (Hutt.), *aspirans* (Blanf.), *fastigiata*, *nana*, and *bullula* (Hutt.), *cherraensis*, *khasica*, *munipurensis*, *sigurensis*, *jaintiaca*, *costulata*, *subcostulata*, *perakensis*, *elongata*, *gratiosa*, *nagaensis*, *teraiensis*, *resinula*, *sikkimensis*, *thotaensis*, *flatura*, and *animula*, spp. nn., all from British India, the first found also in Madagascar. Godwin-Austen, Land and Freshw. Moll. of India, pp. 1–10 & 19–24, pls. i. figs. 1–13, ii. figs. 1–12, v. figs. 1–10; dentition of *K. barrakporensis*, p. 19, pl. v. fig. 11. [Some of these species look almost like young shells.]

Sitala (H. Ad., 1865) = *Conulema* (Stoliczka, 1871), *S. infula* and *attegia* (Bens.), *culmen* and *confinis* (Blanf. & Stol.), *palmaria*, *arx*, and *rimicola* (Bens.), *injussa*, *tricarinata*, ? *tertiana*, and *gratulator* (Blanf.), *mononema* (Bens.), *gromatica*, *haroldi*, *phulongensis*, *limata*, *sub-bilirata*, and *crimani*, spp. nn., all from British India, described and figured, with table of all known species. *Id. l. c.* pp. 25–44, pls. viii.–x.; dentition of the two first copied from Stoliczka, pp. 27 & 30, pl. viii. figs. 1 & 2, *d*, *e*.

Trochonanina peliostoma, sp. n., Martens, JB. mal. Ges. ix. p. 250, Barava, Eastern Africa.

Nanina (*Medyla*) *salmonea*, sp. n., Aucey, Le Nat. iv. p. 119, Cachar.

Microcystis schmackeriana, sp. n., Von Möllendorff, JB. mal. Ges. ix. p. 184, Hongkong.

Microcystina rinki (Mörch), Nicobars, anatomy and radula, *warneforti*, Andamans, *marchiana*, Kondul Isl., Bay of Bengal, *cryptomphalus*, Lower Bengal, and *harrietensis*, Andamans, spp. nn., Godwin-Austen, *l. c.* pp. 11–16, pl. iii.

Zonites latissimus, sp. n., Dohrn, JB. mal. Ges. ix. p. 117, South of Samarcand.

Selenites (Fischer) *vancouverensis* (Lea), *concava* (Say), *voyana* (Newc.), with var. n. *simplicilabris*, *sportella* (Gould), and *duranti* (Newc.), the last forming subg. n. *Haplotrema*, comparatively described; Ancey, *l. c.* pp. 110 & 111.

Ammonoceras nitidulus and *amazonicus*, spp. nn., Prov. Pará, Brazil, and *A. trochilionoides* (Orb.) = *spirillus* (Gould), all more nearly allied to *Streptaxis* than to *Hyalina*; Dohrn, JB. mal. Ges. ix. pp. 97–99. *Hyalinia hemphilliana* (Binn.), and *ingersolli* (Bland), are to be placed in the subgenus *Ammonoceras*; Ancey, *l. c.* p. 29.

Hyalina. M. Schepman has examined the dentition of numerous species, and arranges them according to differences in the dentition, which is figured for all the species mentioned as follows:—

1. *Conulus* (Fitz.), *H. fulva* (Drap.), dentition pl. vi. fig. 1.
2. *Zonitoides* (Lehm.), *H. nitida* (Müll.) and *excavata* (Bean), pl. vi. figs. 2 & 3.
3. *H. olivetorum* (Gm.), *hiulca* (Jan.), *nitens* (Mich.) and *nitidula* (Dr.), the two last very closely allied, pl. vi. figs. 4–7.
4. *H. pura* (Alder), pl. vi. fig. 8.
5. *H. filicum* (Kryn.), *koutaisiana* (Mouss.), *draparnaldi* (Beck), *villæ* (Mortillet), *alhambræ* (sp. n. ?), *cellaria* (Müll.), *alliaria* (Millet), *helvetica* (Blum) and *glabra* (Stud.), dentition pls. vii. & viii. figs. 9–17.
6. *H. hammonis* (Strom.) and *petronella* (Charp.), pl. viii. figs. 18 & 19.
7. *Vitrea* (Fitz.), *H. crystallina* (Müll.) var. *subterranea* (Bourg.) and *diaphana* (Stud.), pl. viii. fig. 20 & 21. JB. mal. Ges. ix. pp. 236–243, pls. vi.–viii.

Clessin subdivides the same genus also according to the dentition as follows:—

1. *Euhyalina* (Alb.), *H. cellaria* (Müll.), *balmii* (Hid.), *draparnaldi* (Beck), *glabra* (Stud.), *hiulca* (Jan.), *alliaria* (Mill.)
2. *Polita* (Held.), type *H. pura* (Alder), also *H. nitens* (Mich.), *radiatula* (Ald.), *petronella* (Charp.), *arborea*, *indentata*, *minuscula* (Say), and *milium* (Morse).
3. *Vitrea* (Held.), *H. crystallina* (Müll.), and *binneyana* (Morse).

The dentition of the species here mentioned is shortly described. Mal. Bl. (2) v. pp. 154–161.

Hyalina cellaria (Müll.), *draparnaldi* (Beck), and *glabra* (Stud.), number and size of the teeth and number of points in the single teeth increasing by age; Sterki, Nachr. mal. Ges. 1882, pp. 172–178.

Hyalina (*Egopina*) *tetuanensis* (Kobelt); Kobelt, Iconographie (2) i. p. 9, pl. ii. fig. 20, Morocco.

Hyalinia (*Retinella*) *antoniana*, sp. n., Mme. Paulucci, Bull. Soc. mal. Ital. viii. p. 169, pl. ii. fig. 3, Sardinia.

Hyalinia chersa and *stochadica* (Bourguignat, 1878 & 1877); Locard, Cat. Moll. Fr. pp. 301 & 302, France.

Hyalinia albinella, sp. n., *nevilliana*, sp. n., *balmii* (Shuttl.), *libysonis* (Paulucci, 1879), *oppressa* (Shuttl.), *pura*, var. *lenticula* (Held.), all from Sardinia, *porroi*, sp. n., Genoa, *obscurata* (Porro), Corsica, *tropidophora* (Mabille), = *obscurata* (Pfr. & Kobelt, *nec* Porro), Corsica, *isseliana*, sp. n., and *meridionalis* (Paulucci, 1881), both in Central and Southern Italy, distinguished and figured; Paulucci. *l. c.* pp. 147–168, pl. i. figs. 1–5, pl. ii. figs. 1 & 2, and 4 & 5, pl. ix. figs. 12 & 13.

Hyalina lentiformis, sp. n., Kobelt, Nachr. mal. Ges. 1882, p. 123, Minorca.

Hyalina tetuanensis (Kob.) figured by Kobelt, Rossm. Iconogr. (2) i. pl. fig. 20.

Hyalinia clessini, Tinos, *zakynthia*, Zante, and *blanci*, Syra, spp. nn., and notes on some other Grecian species; Hesse, JB. mal. Ges. ix. pp. 318 & 319, pl. xii. figs. 2–4.

Hyalina planula, *rathouisi*, *planata*, *mamillaris*, *sinensis*, *zikawciensis*, *sekingeriana*, *colombeliana*, *bambusicola*, *spelæa*, *castaneola*, *imbellis* and *gredlingeriana*, spp. nn., Heude, Moll. terr. Fl. Bleu, pp. 14–19, pl. xiii. figs. 6, 7, 9, & 11–16, pl. xix. figs. 6, 9 & 11, pl. xx. fig. 31, Middle China.

Hyalinia (*Vitrea*) *diaphana* (Stud.), including as varieties *subrimata* (Reinh.) and var. n. *subelata*, Southern Italy; Paulucci, *l. c.* pp. 170–180. *H.* (*V.*) *petricola* and *targioniana*, spp. nn., *ead. l. c.* pp. 180 & 182, pl. ii. figs. 6 & 7, Sardinia.

Hyalina subrimata (Reinh.), *depressa* (Sterki), *dubrueili* (Clessin), *reitteri* (Böttg.), *hyblensis* (Parr.), *contortula* (Kryn.), figured by Kobelt, Iconogr. (2) i. pp. 11–16, pl. iii. fig. 25, pl. iv. figs. 35 & 38–41.

[*Hyalina*] *Zonites pseudodiaphanus*, sp. n., Coutagne, Note fn. mal. Rhone, i. 1881, Rognac, Southern France

Hyalina (*Zonitoides?*) *loana*, sp. n., Gredler, JB. mal. Ges. ix. p. 40, and Mal. Bl. (2) v. p. 170, Prov. Hunan, China.

Hyalinia (*Conulus*) *fulva* (Müll.) [Drap.], varieties; Paulucci, *l. c.* pp. 185–190.

[redacted]*alina* (*Conulus*) *spiriplana*, sp. n., Gredler, JB. mal. Ges. ix. p. 39, [redacted]. Bl. (2) v. p. 170, Prov. Hunan, China.

[redacted]*us cacaus* (Guppy) = *Guppya livida* (Guilding); Guppy, P. Sc. [redacted]nidad, xii. 1881–2.

[redacted]*odiscus fimbriatus*, sp. n., Wetherby, J. Cincinn. Soc. iv. [Dec. 1881], Roans Mountains, North Carolina.

[*Gastrodonta*] *Hyalina significans*, (Bland), figured by Harper, J. Cincinn. Soc. iv. p. 258.

Helix? (*Sagdinella*) *didrichseni* (Mörch), figured from original specimen; Godwin-Austen, Land and Freshwater Moll. of India, p. 45, pl. ix. fig. 1, Nicobars. Animal unknown.

AULACOGNATHA.

Arion. Critical note on some species; Heynemann, Nachr. mal. Ges. 1882, p. 127.

Arion subfuscus, var. n. *albus*; B. Esmark, N. Mag. Naturv. xxvii. p. 98, Osterdalen, in Central Norway, at a height of 2300 feet.

Arion fallax, sp. n., Sterki, Nachr. mal. Ges. 1882, pp. 150–153, Switzerland.

Arion pegorarii, sp. n., Lessona & Pollonera, Mem. Acc. Tor. (2) xxxv. Italy.

Arion dupuyanus (Bourg.) and *Geomalacus bayani* (Jouss.), = *A. bourguignati* (Mabille), juv.; *id. ibid.*

Arion incommodus (Hutt.) = *fuscus* (Müll.), jaw and radula figured; Hutton, Tr. N. Z. Inst. xiv. p. 154, pl. iii. figs. K & R.

Ariunculus isseli (Bourg., MS.), sp. n., Lessona & Pollonera, *l. c.* Italy.

Letourneuxia (Bourg.), not sufficiently distinct from *Arion*; Heynemann, Nachr. mal. Ges. 1882, pp. 129 & 130.

Anadenus (Heynem., 1863), *altivagus* (Theob.) = *giganteus* (Heynem.), anatomical description, *jerdoni*, Kashmir, and *blanfordi*, Darjiling, spp. nn., Godwin-Austen, *l. c.* pp. 46–54, pls. vii. & viii.

Geomalacus maculosus (Allman), anatomically described; *id. l. c.* pp. 60–63, pl. xii. figs. 1–8.

Ariolimax columbianus (Gould), var. n. *heavoxi*; Wetherby, J. Cincinn. Soc. iv. [Oct. 1881], California.

Helix. P. Fischer in his Manual de Conchyliogie, fasc. 5, pp. 470–472, adopts 16 subgenera in this genus, subordinating many others, more or less reasonably, to them.

Helix. European and North African species:—

Helix (*Patula*) *jaenensis*, sp. n., Clessin, Mal. Bl. (2) v. p. 187, pl. iv. fig. 3, Jaen, Andalusia. "Perhaps a variety of *H. rupestris*."

Helix (*Gonostoma*) *supra-costata*, sp. n., Kobelt, Nachr. mal. Ges. 1882, p. 123, Tetuan.

[*Fruticicola*] *Helix mosellica, aubiniana, limonia, dumorum, vellavorum, lepidophora, buxetorum, nemetana, rusinica* (all Bourguignat, 1878), *venetorum* and *villula* (Bourg., 1880), *separica, cussetensis, ceyssoni, indola, langsdorffi, cotinophila, veprium, silanica, odeca, hylonomia, subli[illegible], innoxia, leptomphala, subbadiella, vendoperanensis, vocoutiana, chor[illegible]* and *microgyra* (all Bourg., MS.), spp. nn., *dubisiana* (Coutag[illegible] *hypsellina* (Hauterive, MS.), and *isarica*, spp. nn., Locard, C[illegible] Fr. pp. 337–319, France.

Helix ararica, sp. n., Locard, Ann. Ac. Macon (2) iv. 1882, also J. de Conch. xxx. p. 252, Banks of the Saône, near Macon, allied to *H. plebeia*, (Dr.)

Helix cantiana (Mont.) var. n. *almonis*, Statuti, Bull. Soc. mal. Ital. viii. pp. 31 & 32, vineyards near Rome.

Helix (*Trichia*) *corsica* (Shuttl.) and *perlevis* (Shuttl.), both from

[illegible] Corsica; Mme. Paulucci, Bull. Soc. mal. Ital. viii. pp. 200 & [illegible], pl. iii. figs. 4 & 5.

Helix reitenbacheri (Zeleb.), *grelloisi* (Bourg.), *cubova* (Parr.), *westerlundi* (Blanc.), figured by Kobelt, Rossm. Iconogr. (2) i. pl. v. figs. 52–55.

Leucochroa rimosæ (Jan., 1832) = *bætica* (Rossm., 1853), Sardinia, and its varieties; Paulucci, *l. c.* pp. 191–194.

[*Xerophila*] *Helix ammonis* (Ad. Schmidt) including *discrepans* (Tiberi), Central Italy, *H. cricetorum* (Müll.), Southern Germany, and *H. candicans* (Ziegl.), Hungary, are very distinct according to their genital organs, especially the sagitta amatoria; Hesse, JB. mal. Ges. ix. pp. 33–37, pl. ii. figs. 2–4.

Helix caperata (Mont.) found at Sonderburg in Holstein; Von Martens, SB. nat. Fr. 1882, p. 28.

Helix dantii, *groboni*, *nomephila*, *mauriana*, *frayssiana*, *mouqueroni*, *crema*, *lirouxiana*, and *limara* (all Bourguignat, 1880), *lugduniaca* (Mabille, 1881), *virgultorum*, *morbihana*, *tardii*, *talepora*, *acosmeta*, *velaviana*, *triphera*, *pisanorum*, *armoricana*, *marioniana*, *bertini*, *honorati*, *citharistensis*, *vicianica*, *hypæana*, *deferiana*, *scrupœa*, *coutagnii*, *jeaubernati*, *acosmia*, *subintersecta*, *pictonum*, *lathræa*, *misara*, *sitifiensis*, and *naudieri* (all Bourg., MS.), *xera*, *agna*, and *fædata* (Hagenmüller, MS.), *dasilvæ*, *mendozæ*, and *ogiaca* (Servain, MS.), *didymopsis* (Fagot, MS.), *bolenensis*, *nautica*, *psaropsis*, and *aginnica*, spp. nn., Locard, Cat. Moll. Fr. pp. 323–346, France.

Helix (*Xerophila*) *tuta*, *hillyeriana*, *dohrni*, *quisquiliæ*, spp. nn., *herbicola* (Shuttl.), *sardiniensis* (Villa), and *trochoides* (Poiret) var. n. *infulata*, all from Sardinia, Paulucci, *l. c.* pp. 245–262, pl. vii. figs. 1–5, 7 & 8.

Helix andalusica, Algesiras, and *simiarum*, Gibraltar, spp. nn., Kobelt, JB. mal. Ges. ix. pp. 70 & 71.

Helix interpres (Westerlund), belongs to the subgenus *Xerophila*, with *H. chalcidica* (Mouss.) var. *didyma* (Westl.), both from Hymettus in Attica; Hesse, JB. mal. Ges. ix. p. 323, pl. xii. figs. 5 & 6.

Helix florentiæ (Ponsonby, MS.), Tangier, *ponsonbii*, Oran, *sigensis*, Nemours, in Algeria, *lemoinii* (Debeaux, MS.), Oran, spp. nn., Kobelt, JB. mal. Ges. ix. pp. 68–70.

Helix (*Cochicella*) *conoidea* (Drap.) var. n. *calaritana*, Paulucci, *l. c.* p. 263, pl. vii. fig. 6, Sardinia.

[*Euparypha*] *Helix alibrandi* and *anxurina* (Rigacci, 1874, name only), distinguished from *H. pisana* (Müll.), the former from Civita Vecchia, the latter from Terracini; Statuti, Bull. Soc. mal. Ital. viii. pp. 37–39.

[illegible]*ta*] *Helix arbustorum* var. n. *fragilis*, nearly unicolorous, Trondh[illegible] Norway, at heights of 3000–5000 feet, B. Esmark, N. Mag. [illegible] xxvii. p. 99; British localities continued, Taylor, J. of Conch. i[illegible] 257–259, additions, pp. 302–305; varieties, Clessin, CB. Ver. R[illegible]b. 1882. *Helix xatartii* (Farines), *canigorica* (Boubée), and *xanthalæa* (Bourg.), Pyrenees, distinct from *arbustorum* (L.), P. Fagot, "Espèces des Pyrénées Orientales du groupe de *Helix arbustorum*," [not seen by the Recorder]. *Helix fagoti* (Bourguignat, MS.), Locard, Cat. Moll. Fr. p. 306, Costa Bona, Pyrenees.

[*Campylæa*] *Helix crombezi* (Millière, MS.), *chiophila*, *lautaretiana*, *pelvouxiana*, and *amathia*, spp. nn., Locard, *l. c.* pp. 320–322, French Alps,

the first near *cornea* (Dr.), the following near *glacialis* (F[illegible]) *alpina* (F. B.), the last allied to *cingulata* (Stud.).

Helix (*Tacheocampylæa*) *carotii*, sp. n., Paulucci, *l. c.* p. 203, pl. iii. fig. 1, Sardinia; allied to *raspailii* (Payr.).

[*Tachea*] *Helix nemoralis* (L.) and *hortensis* (Müll.), variations found in France, and differences of both species, *H. subaustriaca* (Bourg.) from the Southern Alps in France, and *H. sylcatica* (Drap.), the oldest species of this group, occurring in the lower pleistocene of Germany; Locard, Ann. Soc. Linn. Lyon, xxix., also in his Contributions à la faune. Mal. Franc. v. 24 pp.

[*Macularia*] *Helix lactea* (Müll.), several varieties, with var. n. *alybensis* [?], *tagina* (Servain) and *bathylæma* (Bourg.), and *H. punctata* (Müll.), several varieties, *H. juilleti* var. n. *beguirensis* (Debeaux, MS.), *dupotetiana* (Terv.), varieties, *jourdaniana* (Bourg.) var. *major*, Tlemcen, and *zaffarina* (Terv.) var. n. *zelleri*, Mascara; Kobelt, Iconogr. (2) i. pp. 27–32, pls. viii.–x. & vii. fig. 64.

Helix codringtoni (Gray) and *kurdistana* (Parr.), varieties figured; *id. l. c.* pp. 26 & 27, pl. vii. figs. 63 & 65.

Helix serpentina (Fér.), Pisa, Leghorn, and Sardinia, var. *trica*, = *H. magnettii* (Mabille, *nec* Cantraine), Provence, var. n. *isaræ*, and *isilensis*, Sardinia, and var. *jaspidea* (Mabille), Leghorn, Corsica, and Sardinia; *H. hospitans* (Bonelli) = *magnettii* (Cantr.), distinct species from Sardinia, with var. n. *alabastrina*; *H. carx* (Cantr.), Sardinia, with var. n. *adjaciensis*, Corsica; *H. cenestinensis* (Crosse & Debeaux) var. n. *suburbana*, Sardinia; *H. pudiosa* and *villica*, spp. nn., Sardinia, all discussed and figured by Paulucci. Bull. Soc. mal. Ital. viii. pp. 207–238, pls. iii. figs. 3 & 6, iv. figs. 5 & 6.

Helix (*Macularia*) *gennarii*, sp. n., Paulucci, *l. c.* p. 206, pl. iii. fig. 2, Sardinia.

Helix (*Macularia*) *alcyone*, sp. n., Kobelt, Nachr. mal. Ges. 1882, p. 122, Southern Morocco.

[*Iberus*] *Helix oberndærferi*, sp. n., Kobelt, Nachr. mal. Ges. 1882, p. 70, and Iconogr. (2) i. p. 25, pl. vi. fig. 62, Mallorca.

[*Pomatia*] *Helix koræœlica*, *promœca*, *pyrgia*, and *pachypleura* (Bourguignat, MS.), spp. nn., Locard, Cat. Moll. Fr. pp. 302–305, France.

[*Pomatia*] *Helix christophii* (Böttg.), Kobelt, Iconogr. (2) i. p. 27, pl. vii. fig. 66, Adscharia.

Helix. Asiatic species:—

Helix helvola (Frivaldszky), Kobelt, Iconogr. (2) p. 16, pl. v[illegible], Siberia.

Helix duplo-cincta and *paricincta* (Martens, 1879) with several va[illegible]s, from Kulja, Martens, Centr. As. Moll. pp. 4 & 5, pl. i. figs. 1–7 & 8–13; anatomy of them by Schacko, *ibid.* pp. 56–60, pl. v. figs. 1–9. They agree most with *H. fruticum* (Müll.).

Helix przewalskii (Martens, 1881), at the River Tetunga, confines of Mongolia and the Chinese province Kansu: Martens, *l. c.* p. 12, pl. ii. fig. 9; anatomy by Schacko, *l. c.* pp. 60–63, pl. v. figs. 10–12; radula

[redacted]nat of *Campylæa*, genital organs and jaw nearer those of *[redacted]cicola*.

Helix cavimargo (Martens, 1879), Kulja; Martens, *l. c.* p. 16, pl. ii. fig. 17.

Helix (*Vallonia*) *ladacensis* (Nevill), from the Tianshan; Martens, *l. c.* p. 3, pl. iii. fig. 3.

Helix apollinis, valley of Naryn River and Alai Mountains, and *mesoleuca*, Kizil Art, both in Central Asia, spp. nn., Martens, SB. nat. Fr. 1882, pp. 105 & 106.

Helix pulchella, *orphana*, *dejeana*, *giraudeliana*, *filippina*, *laciniata*, *billiana*, *ravidula*, *phragmitum*, *huberiana*, *graminum*, *arundinetorum*, *initialis*, *accrescens*, *aubryana*, *biconcava*, *squamosella*, *nautarum*, *micacea*, *barbosella*, *moreletiana*, *percussa*, *hæmatozona*, *magnaciana*, *uncopila*, *straminea*, *cremata*, *sempriniana*, *lepidostola*, *thoracica*, *phyllophaga*, *dormitans*, *obstructa*, *buliminoides*, *pseudobuliminus*, and *buliminus*, spp. nn., Heude, Moll. terr. Fl. Bleu, pp. 20–48, pls. xiii. fig. 17 & 18, xiv. fig. 5–12, xv. figs. 2, 3, 6, 9 & 10, xvi. figs. 1–6, 10, & 11, xvii. figs. 1–6, 29, & 30, xx. figs. 12–20, Middle China [some of the names pre-occupied]. *Helix outangensis* and *houaiensis*, new names for *biconcava* and *obstructa* (Heude, both pre-occupied); *H. straminea* (Heude, *nec* Albers), too near *similaris* (Fer.). Crosse, J. de Conch. xxx. p. 136.

Helix (*Trichia*) *semihispida*, sp. n., Ancey, Le Nat. iv. p. 119, Inkiapo.

Helix (*Fruticoconus*) *trochulus*, Hainan, and *H. eastlakeana*, mainland near Hongkong, spp. nn., Möllendorff, JB. mal. Ges. ix. pp. 184 & 185; the latter near *trisinuata* (Martens).

Helix zenonis, sp. n., Gredler, JB. mal. Ges. ix. p. 48, and Mal. Bl. (2) v. p. 172, Sinanfu, Prov. Shantung; allied to *H. tectum-sinense* (Mart.).

Helix (*Gonostoma*) *subobvoluta*, sp. n., Ancey, Le Nat. iv., p. 45, Inkiapo.

Helix (*Ægista*) *gerlachi* (Möllend.), note on it, var. *abrupta* (Martens), perhaps = *trichotropis* (Pfr.); Gredler, JB. mal. Ges. ix. pp. 41 & 42.

Helix (*Ægista*) *amphiglypta*, sp. n., Ancey, *l. c.* p. 44, Western Szechuen.

Helix (*Plectopylis*) *subchristinæ*, sp. n., Western Szechuen, and *H. christinæ* (H. Ad.) = *subsimilis* (Desh.), *id. ibid.*

Plectopylis cutisculpta, sp. n., Möllendorff, JB. mal. Ges. ix. p. 184, Southern China.

Helix (*Cochlostyla*?) *xanthoderma*, sp. n., *id. l. c.* p. 185, Prov. Kwantung.

Helix hæmastoma, note on its eggs; Stewart, J. L. S. (3) v. [1881], p. 310.

Helix. African species:—

Helix comaliana, *tiani*, *tohenica*, spp. nn., and *pisaniformis* (Bourg., 1881), all belonging to the group of *H. pisana*; Bourguignat, in Revoil's Faune et flore Çomali, Moll. pp. 8–12, pl. iv. figs. 67–76, Somali-land.

Helix mutica, *micra*, and *radiolata*, spp. nn., Morelet, J. de Conch. xxx. pp. 186 & 187, pl. x. figs. 1–3, Mayotte Island, Comores.

Helix pulchella (Müll.), found at Madagascar; *id. l. c.* p. 95.

Helix (*Ampelita*) *shavi* (E. A. Smith, 1879), E. A. Smith, [illegible] p. 382, pl. xxii. figs. 1–3; *H.* (*Amp.*) *eurychila*, sp. n., Crosse, J. Conch. xxx. p. 324; *Ampelita basizona*, sp. n., Mousson, *ibid.* p. 41, pl. iii. fig. 2; *H.* (*Amp.*) *gonostyla*, sp. n., Ancey, Le Nat. iv. p. 119; all from Madagascar.

Helix (*Macrocyclis*?) *covani* (E. A. Smith), Madagascar; E. A. Smith, P. Z. S. 1882, p. 381, pl. xxi. figs. 10–12. [Belongs rather to *Ampelita*.]

Helix (*Helicophanta*) *bicingulata*, sp. n., South-east Madagascar, and note on the localities of 4 allied species; Smith, *l. c.* pp. 380 & 381, pl. xxi. figs. 13 & 14. *Helicophanta audeberti*, sp. n., Mousson, J. de Conch. xxx. p. 38, pl. iii. fig. 1, Madagascar.

Helix (*Cochlodryas*) *cerina* (Mor.), varieties of colour; Ancey, *l. c.* p. 29, Madagascar.

Pachystyla mauritiana (Lam.) = var. of *inversicolor* (Fér.); Morelet, J. de Conch. xxx. p. 95.

Ctenophila, g. n. for *Helix caldwelli* (Bens), and *vinsoni* (Desh.); Ancey, *l. c.* p. 69.

Helix. Australian species:—

Patula coma (Gray), *hypopolia* (Pfr.), and *ignifiua* (Reeve), jaw and radula described by Hutton, Tr. N. Z. Inst. xiv. pp. 150 & 151, pl. iii. figs. A–C, and pl. iv. figs. G–F. See also *Goniognatha*.

Helix campbellica, sp. n., Filhol, Bull. Soc. Philom. [1880], abstract in J. de Conch. xxx. p. 157, Campbell Island.

The New Caledonian spp. of *Helix* are arranged by an anonymous author [Ancey?], Le Nat. iv. pp. 85–87, in 13 natural groups, which he calls genera, and among which the following are new:—

Pseudomphalus, for *Helix fabrii* and *gentilsiana*, Cr.

Monomphalus, for *Helix baveyi* and *heckeliana*, Cr. These two belong, perhaps, to the *Testacellidæ* near *Diplomphalus*.

Micromphalia, for *H. abax*, *vieillardi*, and *caledonica*, Cr.

Platystoma [pre-occupied in fishes and fossil-shells, Rec.], for *H. baladensis* and *astur*, Souv., *turneri*, Pfr., *perroquiniana*, Cr., &c.

Rhytidopsis, for *H. chelonitis* and *prevostiana*, Cr.; jaw ribbed.

Pararhytida, for *H. dictyodes*, Pfr., and *mouensis*, Cr.

Microphyura, for *H. microphis*, Cr.

Helix. North American species:—

Patula solitaria (Say) var. n. *occidentalis*, Crossing, Columbia, and *P. strigosa* (Gould) var., Flathead River, Montana; Martens, SB. nat. Fr. 1882, p. 140.

Patula bryanti, sp. n., Harper, J. Cincinn. Soc. iv. p. 258 *bis*, [1881], North Carolina.

Polygyra sampsoni, sp. n., Wetherby, Tr. Cincinn. Soc. iv. [Dec., 1881], Arkansas.

Helix (*Mesodon*) *devia* (Gould), passing into *mullani* (Bland & Cooper); Ancey, Le Nat. iv. p. 29.

Helix (*Mesodon*) *chilhoweensis*, (Lewis), distinct from *sayi* (Binney); Thomson, J. of Conch. iii. p. 273.

Ampelita rowelli (Newc.), found on the Salt River Mountains, Arizona; Prime, Am. Nat. xvi. p. 909. [Belongs rather to *Lysinoe*.]

Helix. South American species:—

Helix gyroplatys, sp. n., Antioquia, in Colombia, and *suborbicula*, sp. n., = *orbicula* (Pfr., *nec* Orb.), Dohrn, JB. mal. Ges. ix. pp. 99 & 100.

Helix neogranadensis (Pfr.), var.; Dunker, JB. mal. Ges. ix. p. 377, pl. xi. figs. 5 & 6, Ecuador.

Solaropsis rugifera and *diplogonia*, Eastern Peru, *elaps*, Prov. Pará, spp. nn., Dohrn, JB. mal. Ges. ix. pp. 100–102.

[*Dryptus*] *Bulimus lugubris*, sp. n., Dunker, JB. mal. Ges. ix. p. 378, pl. xi. figs. 1 & 2, Pasto, Colombia.

Bulimus (*Eurytus*) *callistoma* and *semperi*, spp. nn., Dohrn, JB. mal. Ges. ix. p. 103, pl. iii. figs. 1–5, Antioquia.

Bulimus (*Odontostomus*) *dæringi*, sp. n., and *philippii* (Döring), Kobelt, JB. mal. Ges. ix. pp. 5–7, pl. i. figs. 6 & 7, Sierra de Cordoba, Argentine States. *Odontostomus ciaranus*, sp. n., Ciara, Brazil, *O. occultus* (Reeve), = *parallelus* (Pfr.), Sta. Catarina, plaits in the aperture variable; *O. neglectus* (Pfr.); *O. sexdentatus* (Spix), distinct from those of Pfeiffer & Reeve, and *O. scabrellus* (Anthony): Dohrn, JB. mal. Ges. ix. pp. 104–106; the first pl. iii. fig. 14, the last fig. 9.

Achatina buchneri, sp. n., Martens, JB. mal. Ges. ix. p. 245, Kuilu river, Angola.

Limicolaria revoili, *gilbertæ*, *rochebruni*, *armandi*, *perrieriana*, *maunoiriana*, *milne-edwardsiana*, *leontinæ* and *rabaudi*, spp. nn., Somali-land, Bourguignat, in Revoil's Faune et Flore Çomali, Moll. pp. 40–52, pl. ii. figs. 24–42, most of them very small for this genus. Anatomy of the first, pp. 97–101, pl.

Limicolaria subconica, sp. n., Martens, JB. mal. Ges. ix. p. 246, Chinchoxo, Coast of Loango.

Bulimus (*Rachis*) *moreletianus*, sp. n., Ancey, Nat. Sicil. i. No. 9, Somali-land.

Bulimus (*Rachis*) *nigrolineatus* (Reeve); E. A. Smith, P. Z. S. 1882, p. 382, pl. xxii. fig. 4, Central Madagascar.

Leptomerus [? Rec.] *dohrni* and *hispidus*, spp. nn., Greeff, Zool. Anz. 1882, pp. 520 & 521, S. Thomé Island, W. Africa.

Bulimus (*Petræus*), first group, large-sized, inflated at the base; *B. fragosus* (Fér.), Yemen, and *forskali* (Beck), Arabia: second group, shell bellied in the middle; *B. candidus* (Lam., *Pupa*), South Arabia and Socotra, *micraulaxus*, sp. n., = *aratus* (Küst., *nec* Recluz), *prochilus*, sp. n., Socotra, *latireflexus* (Reeve), Mascate, *yemenicus* (Paladilhe), Aden, and *labiosus* (Müll.), Socotra and Cape Guardafui, *revoili*, *maunoirianus*, *raveyrianus*, *macropleurus*, *bertrani*, *tiani*, *georgi*, *pauli*, *delagenieri*, spp. nn., Somali-land: third group, shell cylindrical; *B. sabæus* (Bourg., 1876), Yemen, *hedjazicus*, sp. n., between Jedda and Mecca, and *brugnieri*[*i*], new name for *labiosus* (Brugnière, *nec* Müll.), all described, and except the last figured by Bourguignat, in Revoil's Faune et Flore Çomali, Moll. pp. 13–39, pls. i. figs. 1–18, ii. figs. 19–23. Anatomy of *B. revoili*, pp. 91–96, pl.

Bulimus (*Achatinelloides*) *artafelionus*, sp. n., Ancey, Le Nat. iv. p. 60, locality unknown, perhaps Socotra.

Buliminus zebra (Oliv.) var. *spoliata* (Parr.), Attica and Island Tinos, and var. n. *obsoleta*, Attica, and *B. pseudogastrum*, sp. n., = *gastrum* of most authors, Syra, distinct from *gastrum* (Ehrenb.), from the Lebanon; Hesse, JB. mal. Ges. ix. pp. 326–329, *B. gastrum*, pl. xii. fig. 7.

Buliminus labiellus (Martens) var. n. *kokandensis*, Margelan, Kokand, *sogdianus* (Martens) var. n. *kuldshanus*, Kulja, *corniculus*, sp. n., Kulja, Martens, Centr. As. Moll. pp. 21–23, the latter two pl. iii. figs. 3 & 9.

Buliminus (*Napæus*) *prælongus*, *armandi*, and ?*pinguis*, spp. nn., Ancey, Le Nat. iv. pp. 59 & 60, Inkiapo, Central China, the last near *B. macroceramiformis* (Desh.). *B.* (*N.*) *compressicollis* and *albo-reflexus*, id. *tom. cit.* pp. 44 & 45, Inkiapo.

Buliminus minutus, *subminutus*, *brachystoma*, *utriculus*, *obesus*, *funiculus*, *pallens*, *fuchsianus* and *hyemalis*, spp. nn., Heude, Moll. terr. Fl. Bleu, pp. 49–54, pls. xvii. figs. 7–17, and xx. fig. 25, Middle China; *B. thibetanus* and *giraudelianus*, spp. nn., *id. l. c.* p. 54, pl. xvii. figs. 9 & 11, subfossil near Yerkalo, Eastern Tibet.

Buliminus rufistrigatus (Bens.) var. n. *hunancola*; Gredler, JB. mal. Ges. ix. p. 44, Prov. Hunan, China.

Buliminus (*Chondrula*) *entodon*, sp. n., Wjernoje, near Mount Alatau, and *B.* (*Petræus*) *dissimilis*, sp. n., somewhat resembling *Gibbulina*, Arassanbulak, south of Kulja, Martens, SB. nat. Fr. 1882, pp. 106 & 107.

Zua davidia, sp. n., Ancey, Le Nat. iv. p. 45, Inkiapo.

Cionella zacynthia (Roth), found on Corfu; Hesse, JB. mal. Ges. ix. p. 330.

Azeca dohrni, sp. n., Paulucci, Bull. Soc. mal. Ital. viii. p. 271, pl. viii. fig. 1, Sassari, Sardinia.

Azeca silvicola, sp. n., Benoit, Nuov. Catal. p. 82, Madonie, Sicily.

[*Cæcilianella*] *Achatina acicula* found upon bones in an early British burying ground, 3 feet below the surface; Housmann, J. of Conch. iii. p. 317. *Cionella acicula* (Müll.) var. n. *bettgeri*; Hesse, JB. mal. Ges. ix. p. 332, pl. xii. fig. 8, Tinos, Greece. *Cæcilianella vittæ*, *cristallina*, *spadaforensis*, *maritima*, *splendens*, *montana*, and *elegans*, spp. nn., Benoit, Nuov. Catal. pp. 89–92, Sicily.

Stenogyridæ, family *Subulininæ*, anatomical description, structure of the radula, peculiarities of the radula; Pfeffer, in Strebel's Mex. Land Conch. v. pp. 97 & 98.

Stenogyra decollata var. n. *claviformis*, Nemours in Algeria, Kobelt, JB. mal. Ges. ix. p. 71.

Stenogyra (*Clavator*) *johnsoni*, sp. n., E. A. Smith, P. Z. S. 1882, p. 382, pl. xxii. fig. 5, Central Madagascar.

Stenogyra vestita, *hyemalis*, *filaris*, *funicularis*, *nankingensis*, *lucidula*, *lapillina*, *spoliata*, *inflatula*, and *turgidula*, spp. nn., Heude, Moll. terr. Fl. Bleu, pp. 55–59, pl. xvii. figs. 18–28, Middle China.

Stenogyra nutans and *striatissima*, sp. n., Gredler, Mal. Bl. (2) v. p. 176, China, the former figured without name in JB. mal. Ges. viii. [1881] pl. i. fig. 4, the latter described in JB. mal. Ges. ix. p. 49.

Stenogyra ferriezi and *simplex*, spp. nn., Morelet, J. de Conch. xxx. pp. 187 & 188, pl. x. figs. 11 & 12, Mayotte Island, Comores.

Opeas caracasense (Reeve), variations, Mexico, Venezuela, Haiti, *O. rarum* (Miller) Ecuador, *subula* (Pfr.), Mexico, Cuba, St. Thomas, *guatemalense*, Guatemala, *micrum* (Orb.), Brazil, *acutius* (Miller), *aciculiforme* (Miller), *octogyrum* (Pfr.), Venezuela, and *swiftianum* (Pfr.), St. Thomas, conchologically compared and figured by Strebel, Mex. Land Conch. v. pp. 99–108, pls. vii lower part figs. 1–6 & 8, xvii. figs. 8, 9, 13–17, 26, 29 & 30. Anatomical description of *O. caracasense* and *junceum* (Gould), by Pfeffer, *ibid.* pp. 101 & 105, pl. xviii. figs. 2, 4, 9, 10, 11 & 22.

Subulina trochlea (Pfr.), Yucatan, including as variety *S. guayaquilensis* (Miller), shell, soft parts, jaw and dentition described by Strebel & Pfeffer, Mex. Land Conch. v. pp. 114–116, pls. vii. fig. 16, xvii. fig. 32, xviii. figs. 1, 12–16, & 18–21. *Achatina* (*Subulina*) *subcrenata* and *costulata*, spp. nn., Greef, Zool. Anz. 1882, p. 519, S. Thomé Island, W. Africa.

Lamellaxis, g. n. Shell resembling that of *Opeas*, but provided with a distinct lamellar plait on the pillar lip. The species belonging to this genus have been placed by most authors in the genus *Spiraxis* (C. B. Adams), but the typical species of this author appear to be different. *L. mexicanus* (Pfr., *Spiraxis*), two forms from Mexico, *modestus*, sp. n., Mexico, *salleanus* (Pfr.), Haiti, *venezuelensis*, (Pfr.), Caracas, *æquatorius* (Miller) Ecuador, *imperforatus*, sp. n., Mexico, *filicostatus*, sp. n., Guatemala, and *striosus* (C. B. Adams, *Achatina*), Jamaica, conchologically described and figured by Strebel, Mex. Land Conch. v. pp. 109–114, pls. vii. figs. 14, 15, 18 & 19, xii. fig. 13, xvii. figs. 1–7 & 10.

Volutaxis, g. n. Shell resembling *Subulina*, whorls convex, with deep sutures, slowly increasing, perpendicularly plaited, pillar distinctly twisted; apparently not viviparous. *V. sulciferus* (Morelet, *Spiraxis*), *berendti* (Pfr., *Spiraxis*), *tenue-costatus*, *miradorensis*, *similaris*, *conferte-costatus*, *conferte-striatus* and *nitidus*, spp. nn., *linearis* (Pfr., *Spiraxis*), all Mexican, and *rectus* (Pfr., *Bulimus*), Haiti, shells described and figured by Strebel, Mex. Land. Conch. v. pp. 119–125, pls. vii. figs. 9–13, and xvii. figs. 11 & 12. 18–25, and 33–37. The author also refers *Spiraxis acus* (Shuttl.) *melanielloides* (Gundl.) and *blandi* (Crosse & Fisch.) to this genus, and places it among the *Testacellidæ*, but its anatomy is not yet known.

Pyrgia, g. n., near *Stenogyra*, umbilicated, with pillar plait; *P. umbilicata*, sp. n., St. Thomé, W. Africa, Greeff, Zool. Anz. 1882, p. 518.

Pupa polyodon (Drap.) found on the hills of Palestrina; Statuti, Bull. Soc. mal. Ital. viii. p. 69.

Pupa philippii (Cantr.), Greece, teeth in the aperture very variable; Hesse, JB. mal. Ges. ix. p. 333.

Pupa leptocheilos [*-chilus*], sp. n., = *pyrenaica* (Farines), distinct from *megachilus* (Jan.), Pyrenees; P. Fagot, Note sur le veritable *Pupa pyrenaica*. [Not seen by the Recorder.]

Pupa tingitana, Beni Hosemar, near Tetuan, *algesiræ*, Algesiras and *vasconica*, Orduna, spp. nn., Kobelt, JB. mal. Ges. ix. pp. 71 & 72.

Pupa bettyeriana, sp. n., Clessin, Mal. Bl. (2) v. p. 188, pl. iv. fig. 4, Jaen, Andalusia.

Pupa cylindracea (Dac.) [*umbilicata* (Drap.)] var. n. *misella*; Paulucci, Bull. Soc. mal. Ital. viii. p. 278, pl. viii. fig. 2, Sardinia.

Pupa signata (Mouss., 1873), = *cristata* (Martens, 1874), = *muscorum* var. *lundstræmi* (Westerlund), Transcaucasia, Siberia, Turkistan, Yarkand, Mongolia; Martens, Centr. As. Moll. p. 28.

Pupa edentula (Dr.), found living on the undermost part of the stalk of *Spirea filipendula*, one inch beneath the level of the ground; Clessin, Mal. Bl. (2) v. pp. 6–8.

Pagodina bourguignati, sp. n., Coutagne, Note fn. mal. Rhone, i [1881], Rognac.

Pupa larvula, *cryptodon*, *atoma*, and *monas*, spp. nn., Heude, Moll. terr. Fl. Bleu, pp. 75–78, pl. xviii. figs. 18, 19, 20, & 23, Middle China.

Pupa tripunctum, sp. n., Morelet, J. de Conch. xxx. p. 189, Mayotte Island, Comores.

Vertigo bollesiana (Morse) var. n. *arthuri*, Martens, SB. nat. Fr. 1882, p. 140, Dakota. *Vertigo simplex* (Gould), found near Cedar Keys, Florida; Upson in "Our Home and Science Gossip" (Rockford, Illinois, 1881).

Balea perversa (L.) var. *deshayesiana* (Bourg.), Paulucci, Bull. Soc. mal. Ital. viii. p. 286, Sardinia.

Parabalea, g. n., distinct from *Balea* by the want of plaits in the aperture, and the malleolated surface; perhaps nearer to *Peronæus*. *P. dohrniana*, Nevill (*Balea*, 1881), Peru; Ancey, Le Nat. iv. p. 60.

Clausilia silesiaca (A. Schmidt), very near *commutata* (Rossm.), only distinct by the shape of the spiral lamella, and *C. labiosa*, sp. n., Carniolia, hitherto confounded with the former; Clessin, Nachr. mal. Ges. 1882, pp. 135–137.

Clausilia melanostoma (F. J. Schm.), *commutata* (Rossm.), *mucida* (Ziegl.), *ventricosa* (Drap.), several varieties, and *tettelbachiana* (Rossm.), in Styria; Tschapeck, Nachr. mal. Ges. 1882, pp. 20–25.

Clausilia kuesteri (Rossm.) var. n. *sancta* and var. n. *sophiæ*, all from Sardinia; Paulucci, Bull. Soc. mal. Ital. viii. pp. 288–290, pl. viii. figs. 3 & 4.

Clausilia funki (Küst.) and *gredleriana* (Westerl.), Valfondo, Ampezzo, Tirol, both at the same height, the former more abundant on the sunny side, the latter in shade, and *C. letochana* (Gredl.), about 200 paces higher, where the others have disappeared; Gredler, Nachr. mal. Ges. 1882, pp. 131–133.

Clausilia vaucluseusis, sp. n., Coutagne, Note fn. mal. Rhone, i. [1881], Vaucluse.

Clausilia (*Phædusa*) *hungerfordiana*, Nara, *oostoma*, Hakoni, *gracilispira*, Kobi, *sericina*, Chinsinji and Yumagaaishi, *caryostoma*, Kobi, *æthiops*, Nagasaki, *tetraptyx*, Fujisawa, *fusangensis*, Chinsinji, *rectaluna*, Kamatokogiro, *aptychia*, Hakoni, *micropeas* and *subulina*, Chinsinji, spp. nn., and *kobensis* (E. A. Smith) var. n. *pallens*, Suma Yushi, all in Japan; Von Möllendorff, J. A. S. B. li. pt. 2, pp. 2–13, the first ten pl. i. figs. 1–10.

Clausilia moellendorffiana, *pachystoma*, *superaddita*, *cetivora*, *filippina*, *strumosa*, *humana* (Gredl., as var.), *rathouisiana*, *spinula*, *magnaciana*, *magnacianella*, *colombeliana*, *leucospira*, *orphanuli*, *insularis*, *septemplicata*, *nankingensis*, *plano-striata*, *vinacea*, and *fulvella*, spp. nn., Heude, Moll. terr. Fl. Bleu, pp. 60–74, pls. xvii. figs. 14 & 31, xvii. figs. 1–6, 10–12, & 15–17, xx. figs. 20–28, Middle China.

Clausilia ridicula, sp. n., Gredler, JB. mal. Ges. ix. p. 45, and Mal. Bl. (2) v. p. 178, Prov. Hunan, China.

Clausilia (*Phædusa*) *anceyi*, sp. n., Böttger, Nachr. mal. Ges. 1882, p. 68, Inkiapo, Central China.

Clausilia (*Euphædusa*) *porphyrea* and *mucronata*, *C. eastlakeana*, very peculiar, and *C.* (*Hemiphædusa*) *thaleroptyx*, spp. nn., Möllendorff, JB. mal. Ges. ix. pp. 186–188, Southern China, the first from Macao, the rest Fudshien.

Clausilia nevilliana, sp. n., Kamorta, Nicobars, and *C.* (*Pseudonenia*) *andersoniana*, sp. n., Mergui; *id.* J. A. S. B. li. pt. 2, pp. 11 & 12, pl. i. figs. 11 & 12.

Serrulina (Mouss.), generically distinct from *Clausilia* by the pillar folds making their appearance very early in the young shell, and then disappearing again; Böttger, Nachr. mal. Ges. 1882, pp. 33–35.

GONIOGNATHA.

Helix fatua (Pfr.), g. n. ?, radula composed of about twenty imbricating plates, lateral teeth with two subequal cuspids, and long basal plate; Hutton, Tr. N. Z. Inst. xiv. p. 153, pls. iii. figs. F & N, iv. fig. N.

Placostylus bovinus (Brug.), jaw and radula, the former tranversely striated by infoldings of the membrane, giving it the appearance of being composed of many pieces; *id. l. c.* p. 152, pl. iii. figs. D & O.

[*Placostylus*] *Bulimus rossiteri*, sp. n., Brazier, P. Linn. Soc. N. S. W. vi. p. 586, Nehoue Bay, N.W. Coast of New Caledonia.

Orthalicus, general remarks on this genus and its subgenera and the variability of the species by Strebel & Pfeffer, Mex. Land Conch. v. pp. 1–11.

O. princeps (Brod.), many varieties, Mexico, Yucatan, Venezuela, and Trinidad, *O. ferussaci* (Martens), New Granada and Venezuela, *zebra* (Müller, *nec* Shuttleworth), locality unknown, *undatus* (Brug.), Jamaica and St. Thomas, *maracaibensis* (Shuttl.), Maracaibo, *zoniferus*, sp. n., State Guerrero, Mexico, *lividus* (Martens), Mexico, *livens* (Shuttl.), West Coast of Mexico and Michoacan, *obductus* (Shuttl.), Venezuela, Nicaragua, and Guatemala, *ponderosus*, sp. n., locality unknown, *decolor*, sp. n., locality unknown, *boucardi* (Pfr.), Tehuantepec, Oajaca, Orizaba, *fulvescens* (Pfr.), Rio de la Hacha ?, *longus* (Pfr.), Mexico, all described and discussed at length, with some intermediate forms; Strebel, Mex. Land Conch. v. pp. 11–44, shells figured pls. i.–iv. & vi., lower part figs. 1–3 & pl. vii., upper part figs. 1–8. Anatomical descriptions of *O. gallina-sultana*, *atramentarius*, *princeps*, and *zoniferus*, by Pfeffer, *ibid.* pp. 2, 3, 14, & 29, soft parts pls. viii. & xi., radula pls. ix., xi., & xii., jaws pl. x. *Orth. zebra* (Shuttl.) comprises albino varieties of several species; *id. l. c.* pp. 9 & 10.

Orthalicus loroisianus (Hupé), from Juraty, Middle Amazons, described; Dohrn, JB. mal. Ges. ix. p. 109.

[*Orthalicus*] *Bulimus powisianus* (Petit) var.; Dunker, JB. mal. Ges. ix. p. 379, pl. xi. figs. 3 & 4, Rio Cauca, Colombia.

Porphyrobaphe iostoma (Sow.), white variety and occurrence of something like varices, *P. saturnus* (Pfr.), fresh specimens yellowish green, *P. deburghiæ* (Reeve) = *gloriosa* (Pfr.), *P. kelletti* (Reeve) = *fungairinoi* (Hidalgo), with a characteristic red spot without epidermis at the base of the last whorl, and *P. fraseri* (Pfr.), size variable; Dohrn, JB. mal. Ges. iv. pp. 110–114.

Bulimulus. H. Strebel, Mex. Land Conch. v. pp. 45–48, distinguishes conchologically 6 sections and 11 subordinate groups, each exemplified by several species, and adds that anatomically his three first sections, exemplified by *B. berendti* (Pfr.), *schiedeanus* (Pfr.), and *proteus* (Brod.) [*Leptomerus* and part of *Scutalus*, Albers], are decidedly distinct from the three following, exemplified by *B. sulcosus*, *chiapasensis*, *dombeyanus*, *droueti*, *attenuatus*, *paivanus*, *nigro-fasciatus*, and *knorri* (Pfr.), *lobbi* (Reeve), *totonacus*, and *palpalaensis* (Strebel) [parts of *Scutulus*, *Mormus*, *Drymæus* and *Otostomus*, Albers], the former having jaws composed of a few strong plates, and the radula resembling that of *Bulimus* and *Eucalodium*, the latter jaws composed of numerous thin plates, and the radula quite peculiar. [The former seem to correspond to *Bulimulus* as restricted by the Recorder, Binnenmoll. Venezuela, 1873, or *Orthotomium* of Crosse & Fischer, 1875, the latter to *Otostomus*, Martens, 1873, or *Goniognathinus*, Crosse & Fischer, 1875.] General notes on their anatomy; Pfeffer, *ibid.* pp. 49–55.

Bulimulus totonacus, sp. n., Misantla, *palpaloensis*, Jalapa and Misantla, *albo-striatus*, sp. n., Tehuantepec, *berendti* (Pfr.), *dysoni* (Pfr.) ?, *schiedeanus* (Pfr.), *sulcosus* (Pfr.) with several varieties, *rudis* (Anton), *fenestrellus* (Martens) = *gealii* (Ad.), *cuernavacensis* (Crosse & Fisch.) var., *hegewischi* (Pfr.), *inglorius* (Reeve), *heynemanni* (Pfr.), *recluzianus* (Pfr.), *ghiesbreghti* (Pfr.) varr., *iodostylus* (Pfr.), *chiapasensis* (Pfr.), with several varieties, *dombeyanus* (Pfr.) = *alcantaræ* (Bernardi), *fenestratus* (Pfr.), *dunkeri* (Pfr.), *droueti* (Pfr.), *sporlederi* (Pfr.), *aurifluus* (Pfr.), *attenuatus* (Pfr.) = *kefersteini* (Pfr.), *paivanus* (Pfr.), *serperastrus* (Say), *sulphureus* (Pfr.), *uhdeanus* (Martens), *livescens* (Pfr.), *heterogenus* (Pfr.), *gruneri* (Pfr.), and *dominicus* (Reeve), all Mexican, conchologically described by Strebel, *l. c.* pp. 55–95, pls. v., vi., xi. & xii. Anatomical notes on *B. fenestrellus*, *sporlederi*, *attenuatus*, *totonacus*, *palpaloensis*, *paivanus*, *sulphureus*, and the non-Mexican species *fraterculus* (Fér.), *sporadicus* (Orb.), *proteus* (Brod.), *versicolor* (Brod.), *variegatus* (Pfr.), *papyraceus* (Mawe), *virginalis* (Pfr.), *flavidus* (Menke), *liliaceus* (Pfr.), *nigro-fasciatus* (Pfr.), and *knorri* (Pfr.), by Pfeffer, *ibid.*, pp. 56, 58, 59, 65, 79, 81, 83, 84, 87, 89, 90, 91 & 95, soft parts, pls. xiv. & xv., jaws, pl. xvi., feet of radula, pl. xiii.

Otostomus nigro-gularis and *melanoscolops*, spp. nn., Dohrn, JB. mal. Ges. ix. pp. 107 & 108, pl. iii. figs. 10–13 & 6–18, Prov. Pará, Brazil. *O. pulchellus* (Sow.) = *expansus* (Pfr.) = *auris-ratti* (Phil.) = *scitus* (H. Ad.), and *cora* (Orb.) = *tessellatus* (Shuttl.) = *atahualpa* (Dohrn); *id. l. c.* pp. 106 & 107.

[*Bulimulus*] *Bulimus albo-balteatus*, sp. n., Dunker, J.B. mal. Ges. ix. p. 378, pl. xi. figs. 7 & 8, Pasto, Colombia.

ELASMOGNATHA.

Janella. Anatomical notes on the three known New Zealand species, the genus *Konophora* [cf. Zool. Rec. xv. *Moll.* p. 74] being merged into *Janella*; Hutton, Tr. N. Z. Inst. xiv. pp. 158–161, pl. v.

Jarava, subg. n. of *Hyalimax*. Distinguished by the want of a median projection in the jaw, the want of a distinct epidermis in the shell, the position of the anal aperture very far back, &c. *H.* (*J.*) *andamanica*[*-us*], sp. n., Andaman Islands, anatomically described; *H. reinhardi* (Mörch), and *viridis* (Theob.) belong also to this subgenus. H. H. Godwin-Austen, Land and Freshw. Moll. of India, pp. 55–60, pl. xi.

Succinea putris var. n. *vitracea*, *S. intricata*, sp. n., = *corsica* (Kobelt, *nec* Shuttl.), Sardinia, and *S. italica* (Jan.), Northern Italy; Paulucci, Bull. Soc. mal. Ital. viii. pp. 291–302, the two latter, pl. viii. figs. 5 & 6.

Succinea sofiæ, sp. n., Benoit, Nuov. Cat. p. 105, Mazzara, Sicily.

Succinea martensiana (Nevill) with var. n. *gigas*, 25 mm. long., Tian-shan and adjacent countries, *altaica* (Martens, 1871), Southern Siberia, and *ecoluta* (Martens, 1879), Kulja; Martens, Centr. As. Moll. pp. 28–30, pl. iii. figs. 12–18.

Succinea arundinetorum, *carectorum*, *rubella*, *magnaciana*, and *setchuanensis*, spp. nn., Heude, Moll. terr. Fl. Bleu, pp. 80 & 81, pls. xviii. figs. 27–29, & xxi. figs. 1 & 2, Middle China.

Succinea mascarenensis (Nevill), Rodriguez, and *concisa* (Morelet) continental Africa, Mauritius, and Bourbon; Morelet, J. de Conch. xxx. pp. 98 & 99.

Cylindrella triplicata, *atro-purpurea*, *colorata*, *infortunata*, *prima*, *confusa*, *difficultosa*, *consanguinea*, *crassilabris*, *conferta*, *imparata*, and *propinqua*, spp. nn., Cuba, Arango, P. Ac. Philad. 1882, pp. 105–108.

VAGINULIDÆ.

Vaginulus mexicanus, sp. n., external and anatomical description by Strebel & Pfeffer, Mex. Land Conch. v. pp. 126–131, pl. xix. The liver is asymmetrical, its left part being much more extended than the right; the alimentary canal and radula according to the common type of the *Pulmonata*; the jaw composed of imbricated plates; a channel-like communication between the primary and the secondary penis by the vas deferens could not be found in this or other species by Pfeffer, and he doubts its existence, although it has been described after Blainville by several authors.

Vaginulus sinensis, sp. n., Heude, Moll. terr. Fl. Bleu, p. 10, pl. xiii. fig. 2, Banks of Yangtsekiang.

ONCHIDIIDÆ.

Onchidium celticum (Cuv.). J. JOYEUX-LAFFUIE describes at large the habits, anatomy, and development of this curious slug, observed by him

[*Bulimulus*] *Bulimus albo-balteatus*, sp. n., Dunker, J.B. mal. Ges. ix. p. 378, pl. xi. figs. 7 & 8, Pasto, Colombia.

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Vaginulus sinensis, sp. n., Heude, Moll. terr. Fl. Bleu, p. 10, pl. xiii. fig. 2, Banks of Yangtsekiang.

ONCHIDIIDÆ.

Onchidium celticum (Cuv.). J. JOYEUX-LAFFUIE describes at large the habits, anatomy, and development of this curious slug, observed by him

at Roscoff; he comes to the conclusion that it respires water as well as air, water by the dorsal tubercles, which are very rich in blood-vessels, the animal remaining often for several days below the surface, air by the so-called pulmonary cavity, which by its situation, connection, structure, histology, and secretion is really homologous to the renal organ of other *Mollusca*. The disposition of the circulatory organs agrees rather with that in the *Opisthobranchia*; the eyes are placed at the tips of eye-stalks as in the terrestrial *Pulmonata*; the jaw and radula agree with those of some of the *Pulmonata*; concerning the development, he states that it is provided in the larval stage with an embryonal shell and with a large velum, just as in the *Opisthobranchia*. Arch. Z. expér. x. pp. 225–283, pls. xiv.–xxii.

Onchidium. C. Semper continues and finishes his review of this genus, describing the following new species:—*O. steenstrupi*, Nicobars, Carolines, New Guinea, *aberrans*, Singapore ?, *samarense*, Philippines, *multiradiatum* and *trapezoideum*, localities unknown, *dæmeli*, Sydney, *coriaceum*, Singapore, Pinang, Philippines, Brisbane, *graniferum*, Philippines, *luteum*, Singapore, *palaense*, Palau Islands, *papuanum*, New Guinea, *ovale*, locality unknown, *reticulatum*, New Zealand and Sydney, *steindachneri*, Galapagos; he also gives descriptions of *O. carpenteri* (Binn.), California, *boreale* (Dall), Sitkha, *celticum* (Cuv.), Cornwall, and *cinereum* (Q. & G.), Tongatabu, and critical observations on other described species. Reis. Arch. Phil. iii. pt. 6, pp. 265–286, figures of the radula and genital organs, pl. xxi. figs. 1–26.

Onchidina, g. n. Pulmonary orifice rather lateral, right hand of the vent; no penis gland, male orifice behind the right tentacle. *O. australis* (Gray MS., *Onchidella*), Brisbane, Fiji Islands, and Coast of Eastern Africa, anatomically described by Semper, *l. c.* pp 287–289, radula, pl. xxi. fig. 27.

Onchidella patelloides (Q. & G.). No jaw, median tooth of the radula tricuspid, lateral unicuspid, with projecting basal process. Hutton, Tr. N. Z. Inst. xiv. p. 155, pl. iv. figs. B & R.

Auriculidæ.

The internal walls of the whorls are completely reabsorbed in *Melampus*, *Auricula*, *Blauneria*, *Marinula*, *Tralia*, *Alexia*, *Monica*, and *Plecotrema*, partially and chiefly near the columella in *Cassidula* and *Scarabus*, not at all in *Pedipes*; Crosse & Fischer, J. de Conch. xxx. pp. 177–181, pl. viii. figs. 1–14.

Carychium biondii, sp. n., Sardinia, and *mariæ* (Paulucci), Upper Italy, Paulucci, Bull. Soc. mal. Ital. viii. pp. 305 & 306, pl. viii. figs. 7 & 8.

Pythia (Bolten) = *Scarabus* (Montf.). J. C. Cox enumerates 52 described species of this genus, 4 more than Pfeiffer in his last revision (1876), with synonymy and geographical distribution, and critical remarks concerning some of them; J. Linn. Soc. N. S. W. vi. pp. 587–621.

[*Auriculastra*] *Auricula nevillii*, Mauritius, and *gassiesi*, Mayotte,

Comores, spp. nn., Morelet, J. de Conch. xxx. pp. 100 & 194, pls. iv. fig. 5, & x. fig. 10.

Melampus carneus and *avellana*, Mauritius, and *concretus*, Mayotte, spp. nn., and variability in the number of plates in *M. lividus* (Desh.); *id. l. c.* pp. 101–103 & 195, the third, pl. x. fig. 7.

Limnæidæ.

Limnæa truncatula (Müll.) found far from permanent water; Jeffery, J. of Conch. iii. pp. 311 & 312.

Larva of the liver-fluke (*Fasciola hepatica*) found in *Limnæa truncatula*; A. P. W. Thomas, *l. c.* p. 329.

Limnæa truncatula (Müll.) var. n. *schneideri*, Flœi Fjord, Arctic Norway, B. Esmark, Tromsö Museums Aarshefter, v. p. 102, with woodcut. Var. n. *compressa*, Namdalen, in Norway; *id.* N. Mag. Naturv. xxvii. p. 103, fig. 5.

Limnæa stagnalis (L.), *ovata* (Dr.), *peregra* (Müll.), varieties and deformities observed in Norway; B. Esmark, N. Mag. Naturv. xxvii. pp. 79, 84, 88, 97 & 100.

Limnæa peregra (Müll.) var. *cariosa* (Gené), Sardinia; Paulucci, Bull. Soc. mal. Ital. viii. p. 361, pl. ix. fig. 1.

Limnæa mandraliscæ and *minima*, spp. nn., Benoit, Nuov. Cat. pp. 127 & 128, Madonie, Sicily.

Limnæa stagnalis (L.) var. n. *expansilabris*, Tarim River, Mongolia, and var. *minor*, Kash, *auricularia* (L.) var. *ventricosa* (Hartm.), Tarim River, *lagotis* (Schrank) var. n. *solidior*, Ulungur River, Zungaria, *ovata* (Dr.) var. n. *eversa*, Eter in Northern Mongolia, *peregra* (Müll.) var. *marginata* (Mich.), Teksh River, var. n. *nimbosa*, Tarbagatai Mountains, *plicatula* (Benz.) var. n. *fasciolata*, Kuku-nor, *rimata* (Nevill) Kashgar and Northern Mongolia, *pervia* (Martens), Northern China, Eastern Tibet, and Tianshan; Martens, Centr. As. Moll. pp. 32–40, pl. iv. figs. 1–12.

Limnæa perrieri, *poirieri*, and *revoili* (Bourg, 1881), Somali-land, all near *L. orophila* (Morelet), Bourguignat, in Revoil's Faune et Flore Çomali, Moll. pp. 53–57, pl. iv. figs. 77–82.

Limnæa electa, sp. n., and *hovarum* (Tristr.), E. A. Smith, P. Z. S. 1882, p. 385, pl. xxii. figs. 12 & 13, Central Madagascar.

Limnæa affinis (Parreyss), *brevicauda* (Sow.), *brazieri* and *victoriæ*, Australia, E. A. Smith, J. L. S. xvi. pp. 273–275, pl. v. [illegible].

megasoma (Say), anatomical description, gizzard much developed, dentition described; Whitfield, Bull. Am. Mus. i. pp. 29–37, pl.

Limnæa zebra (Tryon), localities in Illinois; A. Hinkley, in "Our Home and Science Gossip" (Rockford, Illinois: June, 1881).

Limnæa peregrina, sp. n., Clessin, Mal. Bl. (2) v. p. 188, pl. iv. fig. 6, Taguara, Brazil.

Physa aradæ, *bourguignati*, *cretana*, and *alessiana*, spp. nn., Benoit, Nuov. Cat. pp. 133–135, Sicily.

Physa madagascariensis (Angas), *lamellata*, and *obtusispira*, spp. nn., E. A. Smith, P. Z. S. 1881, p. 386, pl. xxii. figs. 14–19, Madagascar.

Physa. 52 Australian species enumerated, 26 figured (partly copied), the following new or renamed:—*lessoni* (new name for *nova-hollandiæ*, Lesson, *nec* Blainv.), *grayi* (new name for *nova-hollandiæ*, Gray, *nec* Blainv.), *gracilenta*, sp. n., Queensland, *producta*, sp. n., Clarence and Hunter Rivers, *brazieri*, sp. n., near Sydney, *queenslandica*, sp. n., Queensland, *quoyi*, sp. n., King George's Sound, *etheridgii*, sp. n., South Australia, *brevicalmen*, sp. n., King George's Sound, *tenuilirata*, sp. n., West Australia, and *exarata*, sp n., North Australia; E. A. Smith, J. L. S. xvi. pp. 276–292, pls. v. figs. 19–25, & vi. figs. 1–29.

Physa. 54 Australian species, "more than half for the whole world," enumerated by R. Tate, P. Linn. Soc. N. S. W. vi. pp. 555–558.

Physa hypnorum (L.) travels rapidly, spins a web of slime when it rises to the surface, and rasps its own shell even to the very point of the spire with the jaws: Jeffery, J. of Conch. iii. pp. 310 & 311.

[*Physa*] *Bulimus gibbosa* (Gould) and *variabilis* (Gray), edge of the mantle simple, not reflexed over the shell, jaw and radula described; Hutton, Tr. N. Z. Inst. xiv. pp. 155 & 156, pl. iv. figs. c, q, r, & v.

Amplexa [*Aplexa*] *turrita*, sp. n., Tate, P. Linn. Soc. N. S. W. vi. p. 404, Lake Wendouree, Victoria.

Physa (*Isidora*) *meneghiniana*, *tapparoniana*, and *saprusana*, spp. nn., all from Sardinia, and near *contorta* (Mich.); Paulucci, Bull. Soc. mal. Ital. viii. pp. 319–322, pl. ix. figs. 2–4.

Camptocerus. The two known living species and a new fossil one from the Eocene of Sheerness-on-Sea, *C. priscum*, sp. n., described and figured by H. H. Godwin-Austen, J. G. Soc. xxxviii. pp. 218–221, pl. v.

Planorbis. S. Clessin continues Dunker's monograph of this genus in Küster's Conch. Cab. pt. 319, pp 63–94, pls. xi.–xv. & xvii., describing and figuring 27 species, most of them European; *P. trigyrus* and *raimondii* (Philippi, 1869), pp. 71 & 94, pl. xv. figs. 12 & 9, both from Peru, are not before figured.

Planorbis borealis (Lovén). Monstrosities by deviation of the last whorl; B. Esmark, N. Mag. Naturv. xxvii. p. 101.

Planorbis vorticulus (Troschel) in Silesia; Merkel, Nachr. mal. Ges. 1882, p. 66.

Planorbis cornu (Ehrenb.), from Sardinia; Paulucci, Bull. Soc. mal. Ital. viii. p. 325, pl. viii. fig. 9.

Planorbis benoiti (Bourguignat), sp. n., Benoit, Nuov. Cat. Corleone, Sicily.

Planorbis sibiricus (Dunker, 1848) = *limophilus* (Westerlund) and Mongolia, *nevilli*, new name for *P. lævis*, var. *ladacensis*, and Yarkand form, of Nevill, and *P. pankongensis* (Nevill, MS.), Lake Pankong in Eastern Tibet; Martens, Centr. As. Moll. pp. 42–45, the first and last pl. iv. figs. 13 & 14.

Planorbis acies var. *hunanensis*, Gredler, JB. mal. Ges. ix. p. 47, and Mal. Bl. (2) v. p. 181, Prov. Hunan, China.

Planorbis madagascariensis, sp. n., E. A. Smith, P. Z. S. 1882, p. 387, pl. xxii. figs. 20–22, Lake Itasy, Madagascar.

Planorbis mauritianus (Morelet) is distinct from *compressus* (Hutt.); Morelet, J. de Conch. xxx. p. 104.

Planorbis gilberti (Dunker), Queensland, *fragilis* (Brazier), Queensland, *essingtonensis*, sp. n., Port Essington, and *macquariensis*, sp. n., Macquarie River; E. A. Smith, J. L. S. xvi. pp. 294 & 295, pl. vi. figs. 30–35, pl. vii. figs. 1–6.

Segmentina australiensis, New South Wales, and *victoriæ*, South Australia, spp. nn., *id. l. c.* p. 296, pl. vii. figs. vii.–xiii.

Lantzia (Jousseaume, 1872) = *Erinna* (H. & A. Adams, 1855) is distinct from *Lithotis* by the position of the eyes; Morelet, J. de Conch. xxx. p. 104.

Latia neritoides (Gray): eyes at the outer bases of the tentacles, on jaw, median tooth of the radula bicuspid, reflected part of the lateral teeth oblique to the base, single-cuspid, blunt; Hutton, Tr. N. Z. Inst. xiv. p. 156, pl. iv. figs. E & P.

Gundlachia, septum not always present; Gibbons, J. of Conch. iii. p. 267.

Gundlachia, species not determined, found in the "Sucker" brook, village Canandaigua, Western New York; J. M. Cooke, Am. J. Sci. (3) xxiii. p. 248.

Ancylus. S. Clessin concludes his monograph in Küster's Conch. Cab. pt. 316, pp. 41–80, pl. ix., bringing up the number of described species to 87. *A. expansilabris*, Germany, *dohrnianus*, New Zealand, *striatulus*, Greece, *oregonensis*, Oregon, *paranensis* (Döring, MS.), Parana, the largest species, 12 mm. long, *manillensis*, Manilla, spp. nn., pp. 51, 54, 55, 66, 69, & 71, all figured in previous plates.

Ancylus dickinianus, sp. n., Benoit, Nuov. Cat. p. 148, Lentini, Sicily.

Ancylus clessinianus, sp. n., Jickeli, J.B. mal. Ges. ix. p. 366, Alexandria.

Ancylus australiensis (Tate)?, E. A. Smith, J. L. S. xvi. p. 297, pl. vii. figs. 36 & 37.

Amphibolidæ.

Amphibola avellana (Gm.) Correction of a former anatomical description: no jaw, median tooth of the radula with 5–6 lateral cuspids, lateral tooth single, subquadrate, variable, marginal teeth needle-shaped; Hutton, Tr. N. Z. Inst. xiv. pp. 156 & 157, pl. iv. figs. F, O, & W.

Siphonariidæ.

[redacted]omical description of *Siphonaria australis* (Q. G.) by F. W. Hut- The gills are not free, but merely folds of the integument cross- [redacted]tween two large vessels in the walls of the respiratory chamber; evidently they are adaptive in origin, and not homologous with the gills of other *Mollusca*. The interior of the respiratory chamber and the gills are richly ciliated; the animal seems to respire air and water indifferently. The respiratory orifice is often seen open, both in the air and under water." The reproductive and nervous systems, egg-masses and development are also described. The author comes finally to the conclusion

that *Siphonaria* is a true Pulmonate, and that the *Pulmonata* have been derived from the Opisthobranchs. Ann. N. H. (5) ix. pp. 341–344, pl. xv.

Addisonia, g. n., shell porcellaneous, asymmetrical, remarkably resembling that of *Pilidium* (Midd.) = *Capulacmea* (Sars); gill, or rather series of branchial leaflets, curiously exaggerated, displacing all other soft parts to the other side; dentition peculiar, showing Docoglossal features. *A. paradoxa*, sp. n., New England, 69–130 fath. *Gadinia excentrica* (Tiberi) appears to be closely allied to it. Dall, P. U. S. Nat. Mus. iv. p. 405, and Ann. N. H. (5) x. pp. 17–19. It is identical with *Gadinia excentrica*, which lives in the Mediterranean: Jeffreys, P. Z. S. 1882, p. 673; Am. Nat. xvi. p. 737; Verrill, P. U. S. Nat. Mus. v. p. 334, and Tr. Conn. Ac. v. p. 533.

PULMONATA OPERCULATA.

CYCLOPHORIDÆ.

Cyclotus approximans, *stenomphalus*, *fodiens*, spp. nn., and *hunanus* (Gredl.), Heude, Moll. terr. Fl. Bleu, pp. 4–6, pl. xii. figs. 1, 9, 10, & 11, Middle China.

Cyclotus tuberformis[*tubi-*], sp. n., Möllendorff, JB. mal. Ges. ix. pp. 179 & 252, pl. ix. fig. 1, Whei-chow, Prov. Kwan-tung, China. *C. fortunii* (Pfr.) = *approximans* (Heude), *C. chinensis* (Pfr.), pl. ix. fig. 2, *C. stenomphalus* (Heude) = *campanulatus* (Gredl., *nec* Martens), *hainanensis* (H. Ad., *Pterocyclus*), operculum flat, *minutus* (H. Ad.), operculum with prominent edges of the whorls, all from Southern China; Möllendorff, *l. c.* pp. 253–260.

Pterocyclus lienensis, sp. n., = *planorbulus* (Gredler, 1881, *nec* Sow.), Gredler, JB. mal. Ges. ix. p. 43, Lien-chow, China.

Pterocyclus? gerlachi, sp. n., Möllendorff, *l. c.* p. 180, Southern China; identical with the preceding, *id. l. c.* p. 264.

Cyclophorus nankingensis, *pallens*, *ngantinensis*, *sexfilaris*, and *bifrons*, spp. nn., Heude, Moll. terr. Fl. Bleu, pp. 2–4, pl. xii. figs. 2, 3, 4 6, & 8, Middle China.

Cyclophorus erallatus (Pfr.), Hongkong, *punctatus* (Grat.), envir[illegible] of Canton, *subcarinatus*, sp. n., Whei-chow, Kwan-tung, *pyrostoma*, [illegible] Hainan, *elegans*, sp. n., marble rocks near Shinghingfu, prov[illegible] Kwan-tung, and *clouthianus* (Möllend., 1881), province of Kwan-t[illegible] figured; Möllendorff, *l. c.* pp. 266–274, pls. ix. figs. 3–7, and x[illegible] *C. nankingensis* and *pallens* (Heude) are varieties of *martensianus* [illegible] lend.), *id. l. c.* p. 276.

Cyclophorus (*Craspedotropis?*) *trichophorus* (Möllend., 1881), *pellicosta*, sp. n., Hongkong, Macao, and *hungerfordianus* (Möllend.), Kwan-tung, China, described and figured; *id. l. c.* pp. 337–343, pl. x. figs. 2–4.

Cyclophorus (*Leptopomoides*) *cuticosta*, sp. n., *id. l. c.* p. 180, Hongkong and Macao [apparently = *pellicosta*.—REC.].

Cyclophorus atomus, sp. n., Morelet, J. de Conch. xxx. p. 198, pl. x. fig. 17, Mayotte Island, Comores.

Leptopoma polyzonatum, sp. n., Möllendorff, *l. c.* pp. 181 & 343, pl. x. fig. 5, Hainan.

Alycæus sinensis and *rathouisianus*, spp. nn., Heude, *l. c.* p. 7, pl. xii. figs. 12 & 13, Middle China.

Alycæus lata-costatus, sp. n., and *hungerfordianus* (Nevill), Möllendorff, *l. c.* pp. 182, 344 & 346, pl. x. figs. 6 & 7, Southern China; note on *A. pilula* (Gould), *id. l. c.* p. 347.

Teretropoma [see *Litorinidæ*].

Pupinidæ.

Hainesia (Pfr.) = *Mascaria* (Angas) = *Dacrystoma* (Crosse & Fisch.), and the occurrence of *H. crocea* (Sow.) at Mauritius is only accidental; Morelet, J. de Conch. xxx. p. 94.

Pupina ephippium (Gredl.) and *pulchella* (Möllend.), China; Möllendorff, JB. mal. Ges. ix. pp. 350–353, the latter, pl. x. fig. 9.

Diplommatinidæ.

Diplommatina rufa, sp. n., Möllendorff, *l. c.* p. 181, Whei-chow, Prov. Kwan-tung, China.

Diplommatina subcylindrica, sp. n., from Fudshieu, and *rufa*, sp. n., Washau, *id. l. c.* pp. 349 & 350, the latter, pl. x. fig. 8; note on *D. paxillus* (Gredl.) = *Pupa paxillus* (Heude), *l. c.* p. 348, and Ancey, Le Nat. iv. p. 60.

Cyclostomatidæ.

Cyclostoma betsileoensis, *congener*, and *johnsoni*, spp. nn., E. A. Smith, P. Z. S. 1882, pp. 376–378, pl. xxi. figs. 1–5, Madagascar.

Cyclostomus tricarinatus (Müll.), *scalatus*, and *brevimargo*, spp. nn., Madagascar, Mousson, J. de Conch. xxx. pp. 42–45, pl. iii. figs. 3–5.

Cyclostoma pauluccie, sp. n., Crosse & Fischer, J. de Conch. xxx. pp. 54 & 110, pl. vii. fig. 3, Madagascar.

Cyclostoma verticillatum, *dissotropis*, *trissotropis*, and *vacoense* (Dupont, MS.), spp. nn., Mauritius, subfossil, and the occurrence of *C. unicolor* (Pfr.) and *ligatum* (Müll.) on that island substantiated by Morelet, J. de Conch. xxx. pp. 86–93, the former pl. iv. figs. 1–4.

Cyclostoma horridulum, sp. n., Morelet, *l. c.* p. 197, pl. x. fig. 16, Mayotte.

Otopoma. Historical note on this genus and review of the species from Socotra by Bourguignat in Revoil's Faune et Flore Çomali, Moll. pp. 57–74. *O. beccarii* and *artuffeli*, spp. nn., Jousseaume, Le Nat. 1882, No. 18, p. 139, localities unknown.

Georgia, g. n. Distinct from *Otopoma* by the umbilicus being entirely covered and the pillar lip dilated. *G. naticoides* (Recluz, *Cyclostoma*), *G. austeni*, new name for *Otopoma naticoides*, Godwin-Austen (P. Z. S. 1881, pl. xxvii. fig. 1), *G. guillaini* (Petit, *Cyclostoma*), *clausa* (Sow., *Cyclost.*) and *yemenica*, new name for *Otopoma clausum*, var. β (Pfr.); *G. nati-*

copsis, sp. n., *perrieri* and *poirieri* (Bourg., 1881), and *revoili*, sp. n., Somali-land. Bourguignat, *l. c.* pp. 65–76, the last four pl. iii. figs. 43–56.

Rochebrunia, g. n. [= *Rochebrunnia*, Zool. Rec. xviii. *Moll.* p. 85, but right in list of genera]. Shell turbinato-conical, whorls globose, pillar lip moderately dilated, not recovering the umbilicus, not angularly protruding. *R. philippiana* (Pfr., *Cyclostoma*), *coquandiana* (Petit), *vitellina* (Pfr.), *polita* (Sow.), *guillain*[*i*]*opsis*, new name for *Cyclostoma guillaini* (Pfr., *nec* Petit), *grandidieri* (Crosse & Fisch.), *tricolor* (Pfr.), *conica* and *turbinata* (Godw.-Aust.), *obtusa* (Pfr.), all placed by their authors in *Cyclostoma* or *Otopoma*, and *revoili*, sp. n., Somali-land, Bourguignat, *l. c.* pp. 77–86, the two latter pl. iv. figs. 60, 61, 65 & 66, operculum of *obtusa*, figs. 62–64.

Revoilia, g. n. [*l. c.*] Near *Lithidion*, peristome continuous, alato-dilated, provided at its upper insertion with a prolongation sticking to the last whorl. *R. milne-edwardsi*, sp. n., Somali-land, Bourguignat, *l. c.* pp. 87–89, pl. iii. figs. 57–59; also Ancey, Nat. Sicil. i. No. 9.

Acroptychia manicata, sp. n., Crosse & Fischer, J. de Conch. xxx. p. 325, Madagascar.

Chondropoma deceptor, sp. n., Arango, P. Ac. Philad. 1882, p. 105, Cuba.

Pomatias caficii, *sylvanus*, *agathocles*, and *megotinus*, spp. nn., Benoit, Nuov. Cat. pp. 154–156, Sicily.

Pomatias tessellatus (Rossm.) var. n. *dense-striata*, Hesse, JB. mal. Ges. ix. p. 335, Zante.

Pomatias hueti, sp. n., Kobelt, Nachr. mal. Ges. 1882, p. 121, Constantinople.

Truncatellidæ.

Folin's paper on the genus *Acme* [Zool. Rec. xvii. *Moll.* p. 96] is contained in Act. Soc. Linn. Bord. (4) iv. pp. 187–213; it contains a critical review of the known species, and a special description of *A. cryptomena*, sp. n.

Truncatella truncatula (Dr.), Newport, Rhode Island, Verrill, Tr. Conn. Ac. v. p. 525, pl. lviii. fig. 8.

Assimineidæ.

Assiminea. Heude, Moll. terr. Fl. Bleu, p. 82, distinguishes 3 groups, or subgenera :—

1. *Euassimineæ*, imperforate.
2. *Pseudomphalæ*, imperforate, but apparently perforate by a prolongation of the pillar lip.
3. *Solenomphalæ*, truly perforate.

Assiminea grayana (Leach), Newport, Rhode Island, Verrill, *l. c.* p. 525, pl. lviii. fig. 7.

Assiminea punctum, sp. n., Morelet, J. de Conch. xxx. p. 199, pl. x. fig. 18, Mayotte.

Assiminea granum, sp. n., *id. l. c.* p. 105, pl. iv. fig. 8, Mauritius.

Assiminea (*Euassiminea*) *violacea*, (*Pseudomphala*) *hæmatina* and *flammea*, (*Solenomphala*) *scalaris*, spp. nn., Heude, *l. c.* pp. 81–84, pl. xxi.

figs. 3–6, shells, living animals, radula, and anatomy, the three former at the mouth of the Yang-tse kiang on muddy ground, the last at Shanghai on wet walls.

Helicinidæ.

Helicina hungerfordiana, sp. n., Hong-kong and Macao, and *hainanensis*, sp. n., Hainan, Möllendorff, JB. mal. Ges. ix. pp. 182 & 183. The latter regarded as variety of the former; *id. l. c.* pp. 354 & 355.

[*Hydrocena*] *Realia sinensis* and *nivea*, spp. nn., Heude, *l. c.* pp. 8 & 9, pls. xii. fig. 7, xix. figs. 2 & 4, Middle China; *H. bachmanni* (Gredl.), Möllendorff, JB. mal. Ges. ix. p. 355, China.

Incertæ sedis.

Thyrophorella, g. n., with an operculum moveably attached to the edge of the mouth. *T. thomensis*, sp. n., Greeff, Zool. Anz. 1882, p. 517, St. Thomé Island, West Africa [perhaps the case of the larva of some insect. —Rec.]

SOLENOCONCHÆ.

Dentalium agile (Sars) distinct from *striolatum* (Stimps.), Mediterranean, 86–1963 fath., Jeffreys, Ann. N. H. (5) x. p. 30.

Dentalium capillosum, *candidum*, *subterfissum*, and *ensiculus* (Jeffreys, 1877), Atlantic, figured by Jeffreys, P. Z. S. 1882, pp. 658–660, pl. xlix. figs. 1–4; and note on *D. filum*, id. *l. c.* p. 660.

Dentalium ergasticum, sp. n., Fischer, J. de Conch. xxx. p. 275, Atlantic, 1900 metres.

Dentalium japonicum and *weinkauffi* (Dkr.); Dunker, Moll. Jap. p. 153, pl. v. figs. 1 & 2, Japan.

Siphondentalium teres, sp. n., Northern Atlantic, Jeffreys, P. Z. S. 1882, p. 661, pl. xlix. fig. 5.

Siphondentalium vitreum and *affine* (G. O. Sars), Gulf of Maine and Nova Scotia; Verrill, Tr. Conn. Ac. v. pp. 557 & 558, pl. xlii. figs. 19 & 20.

Cadulus amphora and *gibbus*, spp. nn., *cylindraceus*, *gracilis*, *tumidosus* (Jeffreys, 1877) figured, and note on *C. olivi* (Scacchi, 1835), Jeffreys, P. Z. S. 1882, pp. 663–666, pl. xlix. figs. 6–10.

Cadulus pandionis (Verrill) and *propinquus* (G. O. Sars) var., New England, Verrill, *l. c.* p. 558, pl. lviii. figs. 30–32.

BIVALVIA.

Gills and byssal organ of the Bivalves [see in the General Subject, Respiration and Secretion].

Gastrochænidæ.

Gastrochæna grandis (Desh.); Dunker, Moll. Jap. p. 171, pl. xiv. figs. 10 & 11, Japan.

Clavagella ramosa, sp. n, *id. l. c.* p. 172, pl. xvi. figs. 1 & 2, Japan.

Pholadidæ.

Parapholas piriformis, sp. n., Dunker, Moll. Jap. p. 171, pl. xiv. fig. 4, Japan.

Teredo. Plan by W. N. Horton for avoiding its damages by filling a cylindrical excavation round the core of wood-logs with a special cement; Dall, Am. Nat. xvi. p. 967.

Teredo utriculus (Gmel.), valves and pallets figured without description by Hanley, J. L. S. xvi. p. 541, pl. xii. figs. 9–12.

Myidæ.

Corbula intermedia (Martens, MS.), sp. n., F. Müller, Kosmos, vi. p. 138, shell-mounds in Southern Brazil.

Neæra multicostata (Verrill & Smith) with var. *curta* (Jeffr.), *perrostrata* (Dall) as a distinct species, *rostrata* (Spengl.), *glacialis* (G. O. Sars.), and *obesa* (Lovén) = *pellucida* (Stimps.), New England; Verrill, Tr. Conn. Ac. v. pp. 559–564, some of them figured, pl. xl. figs. 10 *a–c*, and pl. lviii. figs. 39 & 40.

Neæra limatula (Dall, 1881) = *contracta* (Jeffreys, 1881, published 1882), and *lamellifera* (Dall, 1881) = *semistrigosa* (Jeffreys, 1881); Dall, Am. Nat. xvi. p. 884.

Goniophora, new name for *Tropidophora* (Jeffreys, preoccupied), subg. of *Neæra*; Jeffreys, P. Z. S. 1882, p. 687.

Cryptomya elliptica (A. Ad.), Dunker, Moll. Jap. p. 178, pl. vii. figs. 17–19, Japan.

Mya arenaria (L.). Spawning and first stages described by J. Ryder (sexes distinct) in Ferguson's Report of Fish Commission in Maryland; abstract in Am. Nat. xvi. p. 911. Popular names of *M. arenaria* in North America; Dall, Am. Nat. xvi. p. 882.

Anatinidæ.

Myodora triangularis (A. Ad.); Dunker, Moll. Jap. p. 181, pl. vii. figs. 11 & 12, Japan.

Cochlodesma tenerum (Jeffreys, MS., *Thracia*), sp. n., Fischer, J. de Conch. xxx. p. 53, Bay of Biscay, 677–1960 metres.

Periploma orbicularis[-*e*], sp. n., Guppy, P. Sc. Ass. Trinid. xii. 1881–82, Gulf of Paria.

Lyonsia prætenuis, sp. n., Dunker, Moll. Jap. p. 180, pl. vii. fig. 13, Japan.

Mytilimeria flexuosa; animal in alcohol described by A. E. Verrill, Am. J. Sci. (3) xxiv. p. 365.

Tyleria vesti, sp. n., Jickeli, JB. mal. Ges. ix. p. 370, Massowa.

Pholadomya arata (Verrill & Smith), New England; Verrill, Tr. Conn. Ac. v. p. 567, pl. lviii. fig. 37.

Verticordia celata, sp. n., *id. l. c.* p. 566, off Martha's Vineyard, New England, 100 fath.

Pecchiolia gemma (Verrill, *Lyonsiella*, 1880), New England, 487 fath., described; *id. l. c.* p. 565.

Saxicavidæ.

Panopæa aldrovandi, new localities; Kobelt, Nachr. mal. Ges. 1882, p. 47.

Glycymeris generosa (Gould), note on its occurrence on the Pacific coast at extreme low tide, and suggestions as to its introduction into the Atlantic coast of the United States, by J. A. Ryder & H. Hemphill, Bull. U. S. Fish Comm. i. pp. 21, 200, & 201.

Solenidæ.

Solen gouldi (Conrad); Dunker, Moll. Jap. p. 173, pl. xvi. fig. 11, Japan.

Ensiculus marmoratus and *philippianus* (Dkr., *Cultellus*); *id. l. c.* p. 174, pl. vii. figs. 21 & 23, Japan.

Donacidæ.

Donax mesodesmoides and *listeri*, locality unknown, *floridus*, Borneo, and *impar*, Baluchistan, spp. nn., Hanley, J. L. S. xvi. pp. 539–541, pl. xii. figs. 1–4.

Donax dohrnianus, sp. n., Jickeli, JB. mal. Ges. ix. p. 369, Massowa.

Paphiidæ.

Donacilla picta (Dkr.); Dunker, Moll. Jap. p. 195, pl. vii. figs. 7–10, Japan.

Leptomya psittacus, locality unknown, and *spectabilis*, Japan ?, spp. nn., Hanley, P. Z. S. 1882, pp. 576 & 577: both, with *L. gravida* and *cochlearis* (Hanl.); figured without description, J. L. S. xvi. p. 541, pl. xii. figs. 5–8.

Theora lubrica (Gould); Dunker, Moll. Jap. p. 181, pt. 7, figs. 20–22, Japan.

Mactridæ.

Mactra. 29 known species described and figured (many of them copied from Reeve or J. de Conch.) by Weinkauff in Küster's Conch. Cab. pt. 314. *M. ambigua*, new name for *silicula* (Reeve, *nec* Desh.), *l. c.* p. 74, pl. xxvi. fig. 1.

Trigonella crossii (Dkr.) and *straminea*, sp. n., Dunker, *l. c.* p. 183, pl. vii. figs. 1–6, Japan.

Veneridæ.

Dosinia gibba (A. Ad.) and *orbiculata* (Dkr.), Dunker, *l. c.* p. 204, pl. viii. figs. 4–6 & 12–14, Japan.

Mercenaria paucilamellata (Dunker) = *Venus alata* (Reeve), Port Jackson, Tasmania, and Swan River; Brazier, P. Linn. Soc. N. S. W. v. p. 486.

Tapes greeffii (Dkr.), Dunker, *l. c.* p. 207, pl. viii. figs. 15–17, Japan.

Rupellaria semipurpurea, sp. n., *id. l. c.* p. 208, Japan.

Petricola japonica, sp. n., *id. l. c.* p. 209, pl. ix. figs. 4–6, Japan.

Cyrenidæ.

Corbicula fluminalis (Müll.) var. *oxiana* (Martens, 1876), dried bed of an arm of the river Amu-Daria, 37 mm. high; Martens, Centr. As. Moll. p. 48, pl. iv. fig. 15.

Corbicula madagascariensis, sp. n., E. A. Smith, P. Z. S. 1882, p. 388, pl. xxii. figs. 25–27, Central Madagascar.

Corbicula ovalina (Desh.), *nepeanensis* (Less.) = *australis* (Desh.), *deshayesi*, and *sublavigata*, spp. nn., all from Australia; *id.* J. L. S. xvi. pp. 299-304, pl. vii. figs. 24–31.

Sphærium loiræ (Bourguignat, MS.), Manchester, described as a distinct species; Servain, Hist. Aceph. Francf. p. 15.

Sphærium ovale (Fér.), near York, only found of late years, but not probably imported from America; Hey, J. of Conch. iii. p. 271.

Sphærium morini, sp. n., Servain, Hist. Aceph. Francf. p. 11, Frankfort. *S. letourneuxi*, Giurgevo, *servaini* and *alopecanum*, Seine, *bættgerianum*, Warsaw, spp. nn., all near *rivicola* (Leach), Bourguignat, *apud* Servain, *l. c.* pp. 15–18.

Sphærium translucidum (Sow.), *queenslandicum* and *macgillivrayi*, spp. nn., Australia, E. A. Smith, J. L. S. xvi. p. 305, pl. vii. figs. 32–34.

Calyculina clessini (Paulucci, MS.), sp. n., Clessin, Mal. Bl. (2) v. p. 192, pl. iv. fig. 9, Ekaterinoslaw, Russia.

Limosina ventricosa and *weinlandi*, spp. nn., *id. l. c.* pp. 192 & 193, pl. iv. figs. 1 & 2, Hayti.

Pisidium, a fringe of vibratile cilia at the edge of the mantle at the anterior margin; Jeffery, J. of Conch. iii. p. 307.

Pisidium, 10 species observed in Norway; B. Esmark, Mal. Bl. (2) v. pp. 1–6.

Pisidium fossarinum and *italicum* (Clessin) from Sardinia; Paulucci, Bull. Soc. mal. Ital. viii. pp. 348 & 349, pl. ix. figs. 10 & 11.

Pisidium johnsoni, sp. n., E. A. Smith, P. Z. S. 1882, p. 389, pl. xxii. figs. 28 & 29, Central Madagascar.

Pisidium etheridgii, sp. n., *id.* J. L. S. xvi. p. 306, pl. vii. fig. 35, South Australia.

Pisidium lenticula, Dunker (*Sphærium*), common throughout New Zealand; Hutton, Tr. N. Z. Inst. xiv. p. 149, pl. ii. fig. e.

Cardiidæ.

Cardium burchardi (Dkr.) and *beckii* (Ad. & Rv.), Dunker, Moll. Jap. pp. 210 & 212, pl. xv. figs. 1–6, Japan.

Hemicardia donaciformis (Schröter) = *australiensis* (Reeve), Port Jackson, &c.; Brazier, P. Linn. Soc. N. S. W. v. p. 487.

Tridacnidæ.

Tridacna gigas (L.): a specimen, 36 inches long, weighing 528 pounds, from Singapore; San Francisco Bull., March, 1881 (Dall, Am. Nat. xvi. p. 693).

Lucinidæ.

Lucina contraria and *corrugata*, spp. nn., Dunker, Moll. Jap. pp. 215 & 216, pl. xiii. figs. 9–14, Japan.

Axinus orbiculatus (Monterosato) = *granulosus* (Seguenza), Coast of Spain and Morocco; Jeffreys, P. Z. S. 1882, p. 685.

Axinus planatus, sp. n., *id.* Ann. N. H. (5) x. p. 29, Mediterranean, 432–544 fath.

Kelliidæ.

Lepton subrotundum, sp. n., Dunker, Moll. Jap. p. 219, pl. xiv. figs. 12 & 13, Japan.

Solenomyidæ.

Solenomya japonica, sp. n., Dunker, Moll. Jap. p. 220, pl. xiv. fig. 3, Japan.

Astartidæ.

Crassatella japonica, sp. n., = *donacina* (Rve., *nec* Lam.); Dunker, Moll. Jap. p. 220, Japan.

Gouldia (C. B. Adams). R. B. Watson recapitulates the questions connected with this name [Zool. Rec. xviii. *Moll.* pp. 88 & 90] and agrees with E. A. Smith that it may be abandoned; J. of Conch. iii. pp. 299 & 300.

Unionidæ.

M. Braun makes some observations on the larvæ of *Anodonta*, stating that the calcareous needles found during their parasitic life on fishes, belong to the fish, as they are wanting in larvæ fixed on Axolotls; SB. Ges. Dorp. 1882, pp. 429–431.

Unio pictorum and *tumidus*, varieties in the rivers Ouse and Foss; Hey, J. of Conch. iii. pp. 270–272.

Unio alpecanus and *rostratellus* (Bourguignat, 1881), *cyprinorum* (Berthier, 1881), and *jourdheuili* (Rey), Main River, near Frankfort, characterized by Servain, Hist. Acceph. Francf. pp. 22–25.

Unio danemoræ (Mörch, MS.), *rathymus*, *septentrionalis*, *alpecanus*, *feliciana*, *socardianus*, *crassatellus*, *brevierii*, *locardianus*, *milne-edwardsi*, *riciacensis*, *hauterivianus*, *matronicus*, *ligericus*, *arenarum*, *potamius*, *bertheloti*, *bourgeticus*, *lagnisicus*, *rayi*, *pilloti*, *macrorrhynchus*, *berenguieri*, *corbinii*, *fagoti*, *pinciacus*, *fabiformis*, *jousseaumii*, *pornæ*, *meretricis*, *falsus*, *gobionum*, *cancrorum*, *gestroianus*, *gallicus*, *rostratellus*, *anucidulus*, *dolfusianus*, *edyus*, and *fournelli* (all Bourguignat, MS.), *marcellinus*, *cyprinorum*, and *torsatellus* (Berthier, MS.), *melas*, *orthus*, *sequanicus*, *dubisianus*, and *carantoni* (Coutagne, MS.), *contadinus* (Letourneux, MS.), *st.-simonianus* (Fagot, MS.), *orthellus* and *ferojuliensis* (Berenguier, MS.), *andegavensis* and *fascellinus* (Servain, MS.), *veillanensis* (Blanc., MS.), *jourdheuli* (Ray, MS.), *holandrii* (Saulcy, MS.), *dubisiopsis* and *berilloni*, spp. nn., Locard, Cat. Moll. Fr. pp. 354–367, France.

Unio stephaninii, Lake of Toblino, Province of Trento, *moltenii*, with var. *umbrica*, Tiber, and *opisodartos*, Chiari, Prov. of Brescia, spp. nn., Adami, Bull. Soc. mal. Ital. viii. pp. 129–138, pl. v, figs. 1–10.

Unio sinuatus (Lam.), a half shell of rather fresh appearance found in a ditch communicating with the upper Tiber; Statuti, Bull. Soc. mal. Ital. viii. p. 118.

Unio savensis, *pancici*, and *striatulus*, spp. nn., Drouet, Unionidæ de la Serbie, pp. 15, 17 & 19, Servia.

Unio alatus (Say), from Rock River, two-thirds of specimens males, the nacre of the femals much lighter, sometimes nearly white, that of the males purple, the intensity of its colour corresponding to the thickness of the mantle; Upson, in "Our Home and Science Gossip," Rockford, Illinois, 1881 (Dall, Am. Nat. xvi. p. 957).

Unio. 17 Australian species enumerated, with synonyms and localities, E. A. Smith, J. L. S. xvi. pp. 307–313; and 18 by R. Tate, P. Linn. Soc. N. S. W. vi. pp. 567 & 568.

Unio, the known species of New Zealand enumerated, and the soft parts of *U. menziesi* (Gray), described; F. W. Hutton, Tr. N. Z. Inst. xiv. pp. 148 & 149, pl. ii. figs. A–D.

Unio waikarense [*-sis*] (Colenso, Tasm. J. of Nat. Sc. ii. 1841), Waikare Lake, North Island of New Zealand, Colenso, Tr. N. Z. Inst. xiv. p. 169.

Margaritana margaritifera (L.). Pearls and pearl fishery in Saxony [see *suprà*, Generalities, Use by Man].

Anodonta. Critical remarks on some species and enumeration of 20 "species" distributed in 14 groups, all found in the River Main at Frankfort, including *macrostena*, *impura*, *maganica*, *telmœca*, *bythiœca*, *manica*, *morini*, *ocnera*, *complacita*, *rhynchota*, *codopsis*, *friedlanderiana* (Bourgt., MS.), *cypholena* and *frankfurti*, described as new; Servain, Hist. Acoph. Francf. pp. 27–64.

Anodonta racketti (Bourgt., 1881, = *Mytilus cygneus*, Maton & Rackett, var., Tr. L. S. viii. 1807, pl. iii. fig. 3), Servain, *l. c.* p. 55, Edinburgh.

Anodonta sequanica and *georgii* (Bourguignat, MS.), *pelœca* (Servain, MS.), spp. nn., Locard, Cat. Moll. Fr. pp. 349–353, France.

Anodonta. Different forms found in the Rivers Ouse and Foss; Hey, J. of Conch. iii. pp. 269, 270 & 271.

Anodonta nuttalliana, *wahlamatensis*, *oregonensis*, and *californiensis* (Lea) are all varieties of one species, generally distributed from British Columbia to California, and from the sea coast to Montana and Utah; Stearns, P. Cal. Ac., Nov. 20, 1882.

Anodonta iheringi, sp. n., Clessin, Mal. Bl. (2) v. p. 191, pl. iv. fig. 5, Taguara, Brazil.

Pseudanodonta locardi and *ararisana* (Coutagne, MS.), spp. nn., Locard, Cat. Moll. Fr. pp. 348 & 349, France.

Colletopterum, g. n. Near *Anodonta*, hinge arcuated, with a posterior feeble short lamellar tooth; ligament internal, short; lunula broad; both valves soldered by a wing-like production of the dorsal margin. *C. præclarum* and *letourneuxi*, spp. nn., Lower Danube. Bourguignat, Lettres Malacologiques, pp. 45–48, the latter figs. 16 & 17.

Mycetopus plicatus, sp. n., Clessin, Mal. Bl. (2) v. p. 190, Taguara, Brazil.

Jolya (Bourg.). Periostracum extending beyond the margins of the calcareous shell, as in *Solenomya*; ligament internal; hinge formed by an elongated lamella in each valve, both meeting together, if the shell is closed, but not encasing reciprocally: a long whitish rectilinear scarcely prominent ray from the umbones to the postero-dorsal angle. *J. letourneuxi* (Bourg.), from the banks of the River Harrach in Algeria; the author thinks that it lives in deep mud, and proposes a new family for it, *Joly[i]dæ*, to be placed between the *Iridinidæ* and *Mycetopidæ*. Bourguignat, Lettres Malacologiques, pp. 42–44, figs. 13–15.

Dreissenidæ.

Dreissenia belgrandi (Bourguignat, MS.), sp. n., Locard, Cat. Moll. Fr. p. 367, Paris and Arles.

Mytilidæ.

Mytilus edulis (L.), the Mediterranean form [*galloprovincialis*] (Lam.), and *M. barbatus* (L.) [*Modiola*]: notes concerning their cultivation in Italy, chiefly in the "mar piccolo" at Tarento, by A. Issel, Ostricoltura e Mitilicoltura, pp. 209–228.

Mytilus grayanus (Dkr., 1853) = *dunkeri* (Reeve); Dunker, Moll. Jap. p. 221, Japan.

Mytilus bifurcatus (Conrad) is found at San Diego, California, together with a species of *Septifer*, which is only distinguishable from it by examition of the inside [?], and is figured by Reeve under the same specific name; Stearns, P. Ac. Philad. 1882, pp. 241 & 242.

Modiola lutea (Jeffreys, MS., *Mytilus*), sp. n., Fischer, J. de Conch. xxx. p. 52, Bay of Biscay and Morocco, 677–960 metres. *M. polita*, Verr. & Smith, is the same species; Dall, Am. Nat. xvi. p. 884.

Modiola hanleyi, sp. n., Dunker, Moll. Jap. p. 223, pl. xvi. figs. 3 & 4, Japan.

[*Lithodomus*] *Lithophaga* (Bolten, 1789). Dunker begins a monograph of this genus in Küster's Conch. Cab. pt. 316, pls. i.–iv., & pt. 318, pp. 1–8, describing 9 and figuring 28 species; *L. ventricosa*, new name for *malayana*, Reeve, *nec* Philippi, p. 4, pl. i. figs. 3 & 4, *læbbeckeana* and *cavernosa*, spp. nn., p. 7, pls. i. figs. 3 & 4, & ii. figs. 5 & 6, Philippines.

Modiolaria cuneata, sp. n., Fischer, J. de Conch. xxx. p. 53, Bay of Biscay, 1160 metres.

Idas argenteus (Jeffr.), original description corrected; it inhabits deserted tubes of *Teredo*, between the Hebrides and Faröes: Jeffreys, P. Z. S. 1882, p. 683. *Idas argenteus* (Jeffr.) var. n. *lamellosus*, Verrill, Tr. Conn. Ac. v. p. 579, and P. U. S. Nat. Mus. v. p. 342, New England, 335 fath.

Aviculidæ.

Avicula hirundo (L.) var. *nitida* (Verrill), New England, 65–192 fath.; Verrill, Tr. Conn. Ac. v. p. 582, pl. lviii. fig. 43.

Avicula coturnix, *brevialata*, *loveni*, and (*Meleagrina*) *martensi*, spp. nn., Dunker, Moll. Jap. pp. 228 & 229, pl. x. figs. 1–8, Japan.

Meleagrina californica (Carp.). Account of pearl-diving in Bonita Bay, north of Loreto, California; San Francisco Bull. Nov. 1881 (Dall, Am. Nat. xvi. p. 966).

Arcidæ.

Arca obliqua (Phil.), found in the recent state in the Mediterranean, 123–544 fath.; Jeffreys, Ann. N. H. (5) x. p. 28.

Arca pectunculoides (Sacchi) var. *friclii* (Jeffr.) and var. n. *crenulata*, New England, 76–150 fath.; Verrill, Tr. Conn. Ac. v. pp. 574 & 575, the former pl. xliv. figs. 5 & 6.

Scapharca jickelii (Dunker, MS.), sp. n., Jickeli, J B. mal. Ges. ix. p. 369, Massowa.

Scapharca satowi and *troscheli*, spp. nn., Dunker, Moll. Jap. pp. 233 & 234, pl. ix. figs. 1–3, 14, & 15, Japan.

Pectunculus fulguratus, *rotundus*, and *vestitus*, spp. nn., *id. l. c.* pp. 236 & 237, pls. xiv. figs. 18 & 19, and xvi. figs. 7–10, Japan.

Limopsis pygmæa (Phil., *Pectunculus*), in the recent state, Mediterranean, 217 fath.; Jeffreys, Ann. N. H. (5) x. p. 29.

Limopsis woodwardi (A. Ad); Dunker, Moll. Jap. p. 237, pl. xvi. figs. 5 & 6, Japan.

Limopsis loringi (Angas, 1873), Broughton Isles, north of Port Stephens, New South Wales, 35 fath.; Brazier, P. Linn. Soc. N. S. W. vi. p. 789.

Nuculidæ.

Nucula crosbyana, sp. n., Guppy, P. Sci. Ass. Trinid. xii. 1881–82, Gulf of Paria.

Leda unca (Gould), New England and Gulf of Mexico; Verrill, Tr. Conn. Ac. v. p. 572, pl. lviii. fig. 41.

Leda egregia, sp. n., Guppy, *l. c.* Gulf of Paria, West Indies.

Pectinidæ.

Vola puncticulata (Dkr.), Dunker, Moll. Jap. p. 244, pl. xi. figs. 10 & 11.

Pecten glyptus, sp. n., and *hoskynsi* (Forbes) with var. *pustulosus* (Verrill), New England; Verrill, Tr. Conn. Ac. v. pp. 580 & 581, the latter typical, pl. xliv. fig. 42, var. pl. xlii. fig. 22.

Pecten vesiculosus (Dkr.); Dunker, *l. c.* p. 241, pl. xi. fig. 1, Japan.

Pecten sibyllæ, locality unknown, and *loxoides*, Australia, spp. nn., Sowerby, P. Z. S. 1882, p. 120, pl. v. figs. 12 & 13.

Pecten jullieni, sp. n., Jousseaume, Bull. Soc. Z. Fr., Fevr. 1882, California.

Lima marioni and *jeffreysi*, spp. nn., Fischer, Rapport faune sous-marine, and J. de Conch. xxx. p. 52, Portugal and Bay of Biscay, 1068 & 990–1190 metres.

Lima japonica (Dkr.); Dunker, Moll. Jap. p. 245, pl. xi. figs. 8 & 9, Japan.

Spondylus, eye, v. *suprà* in the General Subject.

Plicatula horrida, sp. n., *cuneata* (Dkr.), *muricata* (A. Ad.), and *rugosa* (Dkr.). Dunker, Moll. Jap. pp. 246 & 247, pl. xi. figs. 3–7, Japan; the last name preoccupied, changed into *irregularis*, id. *l. c.* p. 261.

Ostreidæ.

Development of the common oyster, R. Horst, Tijdschr. Nederl. Dierk. Ver. vi. pp. 25–34, pl. iii. Translated in Q. J. Micr. Sci. xxii. pp. 341–346, with a plate; abstract in J. R. Micr. Soc. (2) ii. p. 330, and Zool. Anz. 1882, pp. 160–162.

Notes on the genital organs of the Oyster by P. P. Hoek, C. R. xcv. pp. 869–872.

Parasites and commensals of the Oyster; A. Certes, Bull. Soc. Z. Fr. vii. pp. 347–353.

Ostrea edulis var. *tarentina*, *venetiana* and *tyrrhena*, and *O. plicata* (Chemn.) = *cristata* (auctt.); specimens from Genoa distinguished and figured in woodcut by A. Issel, Ostricoltura, pp. 22–34.

Bouchon-Braudely states that the Portuguese Oyster, *Ostrea angulata* (Lam., *Gryphæa*), recently acclimatized on the west coasts of France, is unisexual, and that its eggs are expelled from the shell, and fecundated in the sea [as in *O. virginiana*; Rec.]; artificial fecundation presents no difficulty of execution in this species. C. R. xcv. pp. 256–259; translated in Ann. N. H. (5) x. pp. 328–330; abstract in J. R. Micr. Soc. (2) ii. p. 606, and Le Nat. 1882, No. 24, p. 185.

Ostrea virginiana (Lam.) [*virginica*, Gmelin]. Anatomical description and observations on comparatively greater energy of growth than in *O. edulis*, breeding, food, green colour, and fauna of the oyster-beds, by J. A. Ryder, in Ferguson's Report on the Fisheries of Maryland, 1881, Appendix 1, and Bull. U. S. Fish Comm. i. pp. 403–419, July, Aug., 1882; abstract by Dall in Am. Nat. xvi. p. 881. Preliminary notes on some points in the minute anatomy of the oyster by the same in Bull. U. S. Fish Comm. ii. pp. 135–137.

E. Ingersoll (vide *suprà*) gives an account of the natural history of American oysters, and discusses more particularly the oyster-beds and their management from Maine to Texas. Oyster cultivation, as practised in Connecticut, is discussed in the Report of the Commissioners of Shell Fisheries in that State (Hartford, 1881, presented to the Legislature in 1882). The oyster-beds in Tangier and Pocamoke Sounds, and parts of Chesapeake Bay, are the subject of a paper by F. Winslow, in the Report of the Commissioners of Fisheries in Maryland (Annapolis, 1880). A valuable article on Chesapeake Oysters in the "New York Herald," Oct. 11, 1881, and another on Oysters in Season, *op. cit.*, Aug. 26, 1881; on deterioration of American Oyster-beds, by F. Winslow, in "Popular Science Monthly," xx., Nov. and Dec., 1881; abstracts by Dall, Am. Nat. xvi. pp. 961–965.

Account of experiments in oyster-culture, and observations relating thereto, by J. A. Ryder, and experiments in artificially fertilizing the ova of the European oyster, by F. Wilson, in Ferguson's Report of Fisheries, 1881, Appendix, pp. 1–80.

Bibliography of oyster-culture in Ferguson's Report on the Fisheries in Maryland, Appendix 3.

J. Cox discusses the Australian species of this genus, and describes more particularly the three following, which are edible, and common on the coast of New South Wales proper, viz., *O. angasi* (Sow.), "mud oyster," *O. subtrigona* (Sow.), "drift oyster," and *O. glomerata* (Gould), "rock oyster," adding critical remarks concerning some other species; P. Linn. Soc. N. S. W. vii. pp. 122–134.

Ostrea lischkii, sp. n., Löbbecke, JB. mal. Ges. ix. pp. 91 & 190, pl. v., Ceylon.

? *Margariona*, g. n., near *Ostrea*, but dimyarian (preliminary note); Dall, Nachr. mal. Ges. 1882, p. 186.

MOLLUSCOIDEA.

BY

PROF. EDUARD VON MARTENS, M.D., C.M.Z.S.

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——. [See also SORBY, H. C.]

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DELLA VALLE, A. Nuove contribuzioni alla storia naturale delle Ascidie composte del golfo di Napoli. Atti Acc. Rom. (3) x. pp. 431–498.

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WHITEAVES, J. F. On a recent Species of *Heteropora* from the Strait of Juan de Fuca. Am. J. Sci. (3) xxiv. pp. 279 & 280.

BRACHIOPODA.

J. F. VAN BEMMELEN reviews the anatomical and microscopical structure of the Brachiopods, and comes to the conclusion that although their shell grows only by apposition, as in the Mollusks, they are morphologically throughout different from the latter, belonging most distinctly to the Enterocœlian type, as defined by Hertwig, and that they have very [illegible]merous and remarkable anatomical relations to the *Chætognatha*. [illegible]at. xvi. pp. 88–161, pls. v.–ix.

[illegible]oast of Spain. List of 6 species of *Terebratulidæ* dredged at [illegible]le depth, by P. Fischer, Rapp. Faune sous-marine, and J. de C[illegible]x. p. 313.

[illegible]minary notes on deep-sea dredging in the Mediterranean, mentioning several species of *Terebratula*, and especially *T. vitrea* (L.), by E. H. GIGLIOLI, Ann. Sci. Nat. (6) xiii., Art. 6. *T. septata* (Philippi), found in the recent state in the depths of the Mediterranean, near the South Coast of France: Fischer, C. R. xciv. p. 1201; also Ann. N. H. (5) ix. p. 477.

Terebratula vitrea (L.), varieties in the Mediterranean; Jeffreys, P. Z. S. 1882, p. 684, and Ann. N. H. (5) x. p. 28.

Terebratula bartletti, sp. n., deep water of the Antilles; preliminary notice by W. Dall, Am. Nat. xvi. p. 885.

Terebratula blanfordi, sp. n., Dunker, Index Moll. Jap. p. 251, pl. xi. figs. 4–6, Japan.

Terebratulina crossii, sp. n., Davidson, J. de Conch. xxx. p. 106, pl. vii. fig. 1, Japan, 52 millimetres long.

Terebratella septata (Phil.), found in the recent state in the Gulf of Lyons, between 445 and 1685 metres; Fischer, C. R. xciv. p. 1201, and J. de Conch. xxx. p. 247, and Milne-Edwards, Rapp. Faune sous-marine, p. 18.

Liothyris, g. n. for *Terebratula vitrea* (Born) [L.]; H. Douville, Sur quelques genres de Brachiopodes, Paris: 1880.

Neothyris, g. n. for *Waldheimia lenticularis* (Desh.), *id. l. c.*

TUNICATA.

A history of our knowledge, with full bibliography, and a general outline of the structure and anatomy of the *Tunicata*, the latter with special reference to the simple Ascidians, is given by W. A. Herdman as an introduction to the *Tunicata* of the 'Challenger,' pp. 5–56, with several woodcuts.

Anatomy and Physiology.

The musculature of the tail of *Fritillaria furcata* is broken up into a series of myomeres, seven in number, corresponding to each pair of nerves given off by the axial nerve-cord; this metamerisation, however, is not obvious in the living or even in a recently killed individual but only in specimens mounted in glycerine after treatment with picric acid. E. Ray Lankester, Q. J. Micr. Sci. (2) xxii. pp. 387–390, with woodcuts.

The structure of the gills and the whole circulatory system in *Ciona intestinalis* is the subject of a paper by L. Roule. The gill is an interlacing of blood-vessels with thin vessels; the vessels in the body are "true lacunes" in the conjunctive tissue, the walls of which are transformed into an epithelial layer. The blood contains three sorts of globules: (1) cells with ramified processes, analogous to the lymphatic globules in the Vertebrates; (2) rounded or mamillated refracting globules; (3) granular yellow cells, which are very rare. The first two sorts of cells are also found copiously in other parts of the body. C. R. xciv. pp. 1662–1665.

The ciliated sac or olfactory organ in the bud of *Pyrosoma* is [illegible] ject of a paper by L. Joliet. He states that the primitive ner[illegible] does not become obliterated in order to constitute the ganglion [illegible] lewsky supposed, but that the ganglion is formed by proliferati[illegible]ls in its wall, the cavity of the canal remaining, and constituting th[illegible]ed sac, which may probably act as a sensory (olfactory) organ. C. R. xciv. 1882, pp. 988–991; also in Ann. N. H. (5) ix. pp. 400–412, and in Le Nat. iv. No. 14. p. 106.

The sexual organs of *Ciona intestinalis* are the subject of a paper by L. Roule. The male and female organs are in the same animal, but wholly separated. The openings of the efferent ducts are, however, close

together, the male duct (canalis deferens), when filled with spermatozoids, presses on the female duct, and obstructs the exit of the eggs, so that both are evacuated about the same time. The formation of the spermatozoids is also described. C. R. xciv. pp. 1726–1729.

J. Playfair McMurrich has observed in *Ascidia* and *Cynthia* that the so-called test cells have their origin in the yelk, and migrate from thence outwards in the space surrounded by the egg-membrane; they contain neither nucleus nor membrane, but only 2-3 granula of yelk-substance, and cannot be distinguished from particles of eggs which have been crushed and dilacerated by external pressure: Stud. Biol. Lab. Hopkins Univ. ii. p. 147, pl. x.; abstract in Biol. Centralbl. 1882, pp. 620 & 621, and in Arch. Z. expér. x. p. lxii.

O. Seeliger describes the formation of the eggs within the ovary in individuals of *Clavelina lepadiformis* (L.), its migration into the peribranchial space, where it becomes fecundated, and the first formation of the buds in the same species, comparing his results with those of previous authors on the same subject; there is not any analogy between the process of gemmation and the development in the egg and the larval stages; gemmation is therefore probably a very lately acquired faculty; the author did not succeed in observing the formation of eggs in individuals raised from the egg or from the free larval stage, but only in individuals formed by gemmation, and he supposes therefore that the former are not able to produce eggs. SB. Ak. Wien, lxxxv. Abth. i. pp. 361–413, 3 pls.

Popular description of the metamorphosis of the *Tunicata* by O. Taschenberg, Verwandlungen der Thiere, 1882, pp. 149–152, with a woodcut.

Herdman, *l. c.* p. 25, proposes the following classification of the *Tunicata*:—

Order I.—Ascidiacea.
- Sub-Order I. *Ascidiæ simplices.*
  - Family 1. *Molgulidæ*; 2. *Cynthiidæ* (including as subfamilies the *Boltenineæ* and *Styelineæ*); 3. *Ascidiidæ*; 4. *Clavelinidæ*.
- Sub-Order II. *Ascidiæ compositæ.*
  - Family 1. *Botryllidæ*; 2. *Didemnidæ*; 3. *Distomidæ*; 4. *Polyclinidæ*; 5. *Diplosomidæ*.
- Sub-Order III. *Ascidiæ salpiformes.*
  - Family, *Pyrosomidæ*.

II. Thaliacea.
- Family 1. *Doliolidæ*; 2. *Salpidæ*.

III. Larvacea.
- Family, *Appendiculariidæ*.

Geographical Distribution.

Herdman has worked up the simple Ascidians of the 'Challenger' Expedition, describing and figuring 82 species, most of which were not known before, but have been preliminarily characterized by the same author in P. R. Soc. Edinb. 1879–81; some are entirely new, including some new

genera ; 7 were found in the North Atlantic, 5 in the South Atlantic, 18 in the Southern Ocean (to the south of the Indian Ocean, including Kerguelen), 10 in the seas of the Malayan Archipelago, 6 in the North Pacific, 28 in the South Pacific, 12 near the southern end of America. It appears from these lists that simple Ascidians are not abundant in the northern hemisphere, and are comparatively scarce in tropical latitudes, while they attain their greatest numerical development in southern temperate regions, 33 species having been found between 30° and 40° S. lat., and 28 between 40° & 45°. In *Boltenia*, one species occurs in the extreme north, while the other two are from far south, the genus being unrepresented in intermediate latitudes. Concerning the bathymetrical distribution, 47 species, representing 13 genera and all 4 families, were found between the shore and 50 fath. ; 22 species (9 genera, 4 families) between 50 & 500 fath. ; 8 species (5 genera, 3 families), between 500 and 1000 fath. ; 6 species, viz., *Culeolus recumbens*, *perlucidus*, *perlatus*, *Fungulus cinereus*, *Bathyoncus mirabilis* (*Cynthiidæ*), and *Corynascidia suhmi* (*Ascidiidæ*), between 1000 & 2000 fath. ; and finally 7 species, viz., *Culeolus murrayi*, *moseleyi*, *Styela bythia*, *squamosa* (*Cynthiidæ*), *Corynascidia suhmi*, *Abyssascidia wyvillii*, and *Hypobythius calycodes* (*Ascidiidæ*) between 2000 & 3000 fath. The *Cynthiidæ* and *Ascidiidæ* range from the shore to 2600 fath., the *Molgulidæ* to 600 fath., the *Clavelinidæ* only to 129 fath. The nature of the bottom and the temperature appear to have little influence upon their distribution. Many deep-water forms have the posterior end of the body prolonged to form a peduncle by which the animal is attached ; for example, *Ascopera* among the *Molgulidæ*, the *Boltenineæ*, *Corynascidia* and *Hypobythius* among the *Ascidiidæ*. *Tunicata* of the 'Challenger,' Geogr. Distrib. pp. 249–274, summary, p. 275.

12 species of simple Ascidians, collected on the southern coasts of England during the cruise of the yatch 'Glimpse,' are enumerated and described by H. C. SORBY & W. A. HERDMAN, J. L. S. xvi. pp. 527–536.

West Indies and *Brazil*. 1 species of *Molgula*, 7 *Cynthiidæ*, and 7 *Phallusiidæ* described in Danish and Latin by P. A. TRAUSTEDT, Vid. Medd. 1881, pp. 108–125 & 271–286, figures of the whole animals pl. iv., particulars of the branchial sacs, pl. v.

ASCIDIÆ SIMPLICES.

P. A. TRAUSTEDT points out that some genera and species of Ascidians are asymmetrical : agreeing with Lacaze-Duthiers in calling the side of the ganglion dorsal, and the side of the intestine ventral, he finds that in the families *Cynthiidæ* and *Molgulidæ*, and in most species of *Phallusia*, except *P. turcica* (Sav.), the intestine deviates to the left, in *Chelyosoma*, *Corella*, *Rhodosoma*, and *Abyssascidia* to the right. The disposition of the muscles is asymmetrical in *Phallusia*, *Corella*, *Chelyosoma* and *Abyssascidia*, the muscles of the right or left side being more developed, generally of that side which is opposed to the deviation of the intestine. The oral and cloacal orifices also become asymmetrical in *Chelyosoma*, that is to say, they are not contained in the median plane, which is determined by the ganglion, the basis of the dorsal plait, and the ventral furrow, but deviate

genera ; 7 were found in the North Atlantic, 5 in the South Atlantic, 18 in the Southern Ocean (to the south of the Indian Ocean, including Kerguelen), 10 in the seas of the Malayan Archipelago, 6 in the North Pacific, 28 in the South Pacific, 12 near the southern end of America. It appears from these lists that simple Ascidians are not abundant in the northern hemisphere, and are comparatively scarce in tropical latitudes, while they attain their greatest numerical development in southern temperate regions, 33 species having been found between 30° and 40° S. lat., and 28 between 40° & 45°. In *Boltenia*, one species occurs in the extreme north, while the other two are from far south, the genus being unrepresented in intermediate latitudes. Concerning the bathymetrical distribution, 47 species, representing 13 genera and all 4 families, were found between the shore and 50 fath. ; 22 species (9 genera, 4 families) between 50 & 500 fath. ; 8 species (5 genera, 3 families), between 500 and 1000 fath. ; 6 species, viz., *Culeolus recumbens*, *perlucidus*, *perlatus*, *Fungulus cinereus*, *Bathyoncus mirabilis* (*Cynthiidæ*), and *Corynascidia suhmi* (*Ascidiidæ*), between 1000 & 2000 fath. ; and finally 7 species, viz., *Culeolus murrayi*, *moseleyi*, *Styela bythia*, *squamosa* (*Cynthiidæ*), *Corynascidia suhmi*, *Abyssascidia wyvillii*, and *Hypobythius calycodes* (*Ascidiidæ*) between 2000 & 3000 fath. The *Cynthiidæ* and *Ascidiidæ* range from the shore to 2600 fath., the *Molgulidæ* to 600 fath., the *Clavelinidæ* only to 129 fath. The nature of the bottom and the temperature appear to have little influence upon their distribution. Many deep-water forms have the posterior end of the body prolonged to form a peduncle by which the animal is attached ; for example, *Ascopera* among the *Molgulidæ*, the *Boltenineæ*, *Corynascidia* and *Hypobythius* among the *Ascidiidæ*. *Tunicata* of the 'Challenger,' Geogr. Distrib. pp. 249–274, summary, p. 275.

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to that side, the muscles of which are much more developed. Concerning the muscles and these orifices, there is no other difference than that of right and left, the same as between any object and its reflection in a mirror; but as regards the intestine, the difference between right and left is accompanied by differences in the relative situation of the stomach, which lies more below when the intestine deviates to the left, and more above when it deviates to the right; this may be termed rather a true shifting (forskydning) than a mere asymmetry. The author thinks that an asymmetrical fixation of the larva is the first cause of the asymmetry in the muscles; and that this asymmetry in the muscles may cause the deviation of the intestine. Vid. Medd. 1881, pp. 257–268.

The most important morphological peculiarity found in the deep-water Ascidians is the very remarkable condition of the branchial sac in the genera *Culeolus*, *Fungulus*, and *Bathyoncus*; stigmata are apparently not formed in consequence of the suppression of the fine interstigmatic vessels; the author thinks that really there is a double row of laterally placed stigmata, running transversely in place of longitudinally, and that this is not a primitive surviving form of the sac, but an after modification of a more complicated type. A very notable feature is also the presence of large blood-vesicles and hollow papillæ in the test of *Culeolus murrayi*, which may be an accessory respiratory apparatus; in others, the terminal branches of the blood-vessels are prolonged into hair-like processes of the test, for attaching foreign bodies so as to form a continuous protecting and concealing coat; this is the case in the *Molgulidæ* generally, in *Polycarpa molguloides* among the *Cynthiidæ*, and in *Ascidia conchilega* among the *Ascidiidæ*. Calcareous spicula are present in several species of *Culeolus* and *Cynthia*: in the former, they are smooth, irregularly branched, and placed in the walls of the endostyle and the branchial sac, and in the tentacles, the dorsal lamina, and other organs; in *Cynthia*, they are minutely echinated, simply rod-shaped or fusiform, and occur in the test, the mantle, and in the vessels of the branchial sac. The stomach and intestine vary considerably throughout the *Ascidiidæ* in their relation to the branchial sac; the simplest and central arrangement seems to be that which prevails in *Ciona*, where the œsophagus continues the antero-posterior line of the branchial sac, and thus throws the stomach and the first part of the intestine behind the branchial sac. In *Ascidia* and *Pachychlæna*, the stomach and intestine are placed on the left side of the branchial sac: in *Corynascidia*, *Abyssascidia*, and most distinctly in *Corella*, on the right side. The author attributes these changes to a posterior prolongation of the branchial sac in one or the other direction, the stomach and intestine remaining comparatively passive. Herdman, *Tunicata* of the 'Challenger,' pp. 275–285.

Phylogenetic table of the *Ascidiæ simplices*; id. *l. c.* p. 286.

Molgulidæ.

General observations on this family; *id. l. c.* pp. 58–61.

Molgula capiformis, sp. n., Sorby & Herdman, P. L. S. xvi. p. 533, pl. xi. figs. 1–8, Hoolen Bay, S. England.

Molgula (Forbes), generic description and *M. gigantea* (Cunningham), *gregaria* (Less.), both from South America, *horrida* (Herdm.), Falkland Isles, *forbesi* (Herdm.), Port Jackson, and *pyriformis* (Herdm.), Buenos Aires; Herdman, *Tunicata* of the 'Challenger,' pp. 67–80, pls. iv. & v., and vi. figs. 1–3.

Molgula (Forbes), analytical table of 23 species, *M. eugyroides*, Bahia, and *occidentalis*, Danish islands of the West Indies, spp. nn.; Traustedt, Vid. Medd. 1882, pp. 109–114, pls. v. figs. 1–5, vi. fig. 14.

Ascopera (Herdm.), general description of the genus, and special of *A. gigantea*, and *pedunculata* (Herd., 1880–81), both from Kerguelen, 150 fath.; Herdman, *l. c.* pp. 61–67, pls. i. ii. & iii.

Eugyra kerguelensis (Herdm.), *id. l. c.*, pp. 81–83, pl. vi. figs. 4–9, Kerguelen, 10–100 fath.

Bostrichobranchus, g. n., distinguished from *Eugyra* by the large number, smallness, and corkscrew shape of the infundibula of the branchial sac. Only one species, *Ascidia manhattanensis* (Dekay), North America; Traustedt, *l. c.* p. 109.

CYNTHIIDÆ.

Analytical table of the 8 genera of *Cynthiidæ*, by Traustedt, Vid. Medd. 1882, pp. 114 & 115; of the *Styelinæ*, by Herdman, *Tunicata* of the 'Challenger,' p. 149; of the *Bolteniinæ*, id. *l. c.* p. 85.

Probable phylogenetic table of the genera in this family by Herdman, *l. c.* p. 278.

Cynthia (Sav.), analytical table, comprising 19 species; *C. clavigera*, sp. n., Chile and Peru; *C. riiseana*, sp. n., St. Thomas, West Indies: Traustedt, *l. c.* pp. 115–119, pls. v. fig. 13, vi. figs. 19 & 20.

Cynthia cerebriformis, fissa, formosa, arenosa, irregularis, complanata (Herdm., 1881), *pallida* (Heller), Cape of Good Hope and Fiji Islands, *papietensis*, sp. n., Papiete Harbour, Tahiti, fully described by Herdman, *l. c.* pp. 134–147, pls. xv. & xvi.

Microcosmus helleri (Herdm.), Torres Strait, *propinquus* (Herdm.) and *propinquus* (Heller), Bass Strait; *id. l. c.* pp. 130–134, pl. xiv.

Microcosmus (Heller), analytical table comprising 11 species. *M. anchylodeirus*, sp. n., St. Thomas, West Indies; Traustedt, *l. c.* pp. 120–122, pl. vi. fig. 18.

Styela (MacLeay, Heller), generic description, dorsal lamina in one species in the form of languets, and *S. bythia, squamosa, grandis, convexa, lactea, exigua, clava, oblonga, flava, glans* (Herdm., 1881) and *radicosa*, sp. n., Bass Strait; Herdman, *l. c.* pp. 149–164, pls. xviii.–xx., and xxiv. figs. 6 & 7.

Styela plicata (Lesueur) = *cuviera* (Chiaje) = *verrucosa* (Philippi) = *gyrosa* (Heller), Mediterranean, West Indies, Brazil, Mauritius, Australia, and Polynesia; Traustedt, *l. c.* pp. 123–125, pls. v. fig. 6, vi. fig. 16.

Styelopsis, g. n., distinct from *Styela* by the presence of only one plait in the branchial sac, which is on the right side; the genital organs are also only developed on the right side. Only one species, *S. grossularia* (Beneden, as *Ascidia*); Traustedt, *l. c.* p. 115.

Bathyoncus, g. n. Body ovate, sessile, slightly attached; apertures inconspicuous. Test membranous and transparent. Branchial sac with several slight folds on each side, and a larger one on the left side near the dorsal edge; meshes square, no stigmata. Dorsal lamina a plain membrane. Tentacles simple. Alimentary canal on the left side. A single elongated genital gland on each side. The chief peculiarity is in the structure of the branchial sac. *B. mirabilis*, sp. n., between Cape of Good Hope and Kerguelen Island, 1600 fath.; Herdman, *l. c.* pp. 165–167, pl. xxiv. figs. 8–12.

Polycarpa pomacea (Sav.)? and *comata* (Ald.) Sorby & Herdman, J. L. S. xvi. pp. 531 & 532, the latter pl. x. fig. 6, Southern coasts of England.

Polycarpa viridis (Quoy & G., *Ascidia*), Port Jackson; *P. minuta*, *molguloides*, *quadrata*, *pilella*, *rigida*, *longisiphonica*, *irregularis*, *sulcata*, *pedata*, and *radicata* (Herdm., 1881), fully described by Herdman, *l. c.* pp. 167–182, pls. xxi.–xxiii. and xxiv. figs. 1–5.

Polycarpa spongiabilis, West Indies and Brazil, and *obtecta*, St. Thomas, spp. nn.; Traustedt, *l. c.* pp. 125–127, pls. v. figs. 7–9, vi. fig. 15.

Boltenia elegans (Herdm.), Nova Scotia, *legumen* (Less.), Straits of Magellan and Falkland Islands, and *pachydermatina* (Herdm.), New Zealand; Herdman, *l. c.* pp. 86–90, pl. vii.

Culeolus, g. n., near *Boltenia*. Body pedunculated, tentacles compound branchial aperture triangular, atrial aperture bilabiate. Terminal twigs of the blood-vessels opening into a well-developed system of globular cavities, separated by extremely thin walls from the external medium, and in direct connection with the delicate hollow papillæ projecting from the outer surface of the test. 6 species, all from over 1000 to 2000 fath., in various parts of the world. Herdman, P. R. Soc. xxxiii. pp. 104–106, with woodcut.

Culeolus murrayi, *wyville-thomsoni*, *recumbens*, *perlucidus*, *moseleyi* (Herdm.), and *perlatus* (Suhm, MS.), = *suhmi* (Herdm., 1881; see Zool. Rec. xviii. *Moll.* p. 99), fully described and compared; Herdman, *Tunicata* of the 'Challenger,' pp. 90–126, pls. x.–xii. and xiii. figs. 1–6.

Fungulus, g. n. Body globular, borne on a short thick peduncle attached to the anterior end; branchial aperture triangular, atrial aperture bilabiate. Test cartilaginous, but very thin, not modified on the peduncle. Branchial sac with several slight folds, meshes square, no stigmata. Dorsal lamina a plain membrane. Tentacles compound. A single genital gland on each side. Internal structure therefore nearer to *Boltenia* than to *Cynthia*. *F. cinereus*, sp. n., between Cape of Good Hope and Kerguelen Island, 1600 fath. Herdman, *l. c.* pp. 127–130, pl. xiii. figs. 7–10.

Ascidiidæ (Phallusiidæ).

Traustedt characterizes the family *Phallusiidæ* by 6 or more lobes in the oral and cloacal orifices, the non-branched tentacles, and the non-plaited branchial sac, and gives the chief characters of the 6 genera contained in it: *Chelyosoma*, *Corella*, *Rhodosoma*, *Ciona*, *Phallusia*, and

Abyssascidia; Vid. Medd. 1881, p. 270 (in Danish), pp. 284 & 285 (in Latin).

Herdman gives a table of the genera of this family and their mutual affinities in *Tunicata* of the 'Challenger,' p. 185.

Ascidia (L., restricted) = *Phallusia* (Sav.), general remarks on the structure of the branchial sac and schematic diagram of the whole animal; *A. challengeri*, sp. n., nearly allied to *mentula* (Müll.), Kerguelen, 10–60 fath., *nigra* (Sav.), Bermudas, *vasculosa* and *placenta*, Kerguelen, *meridionalis*, Buenos Aires, *falcigera*, Nova Scotia, *tenera*, Straits of Magellan and Buenos Aires, *translucida* and *despecta*, Kerguelen, *cylindracea* and *pyriformis*, Australia (all Herdm., 1880), fully described by Herdman, *l. c.* pp. 196–220, pls. xxx.–xxxiv.

Ascidia mamillata (Cuv.), Sorby & Herdman, J. L. S. xvi. p. 529, pl. x. figs. 1–5, Southern Coast of England.

[*Ascidia*] *Phallusia styeloides*, *hygomiana*, *curvata*, and *longitubis*, spp. nn., and *P. atra* (Lesueur) = ? *nigra* (Savigny, *nec* Herdman), St. Croix, St. Thomas, and other islands of the West Indies; Traustedt, Vid. Medd. 1881, pp. 276–284 & 286, pls. iv. figs. 5–12, v. figs. 16–22, figures of the whole animals, and particulars of the branchial sac.

Phallusia mentula (Müll.) and *mamillata* (Cuv.), note on its parasites; Giesbrecht, MT. z. Stat. Neap. iii. pp. 291–298.

Pachychlæna (Herdm., 1880, as subg.) elevated to generic rank, *P. oblonga* and *obesa* (Herdm., 1880), Bass Strait, and *gigantea* (Herdm., 1880), Simon's Bay, Cape of Good Hope; Herdman, *Tunicata* of the 'Challenger,' pp. 221–227, pls. xxviii. & xxix.

Hypobythius (Moseley, 1876), generic character. *H. calycodes* (Moseley), North Pacific, 2900 fath., and *moseleyi*, sp. n., South Atlantic, 600 fath.; *id. l. c.* pp. 227–233, pl. xxxvii.

Ciona (Sav., Flem.), generic character discussed. *C. flemingi* (Herdm., 1880), Canary Islands, 78 fath., and *C. savignii*, sp. n., Japan, 8–50 fath.; *id. l. c.* pp. 233–237, pls. xxxiv. figs. 7–10, xxxv. figs. 1 & 2.

Ciona intestinalis (L.), lives only about five months; Weissmann, Ueber die Dauer des Lebens, 1882, p. 81.

Abyssascidia wyvillii (Herdm., 1880), South of Australia, 2600 fath., fully described; Herdman, *l. c.* pp. 193–196, pl. xxvii.

Corella (Ald. &. Hanc.), analytical table of the 6 known species, and *C. japonica* (Herdm., 1880), fully described; *id. l. c.* pp. 189–193, pl. xxvi.

Corella minuta, sp. n., St. Thomas, West Indies, and *eumyota*, sp. n., Bahia and Valparaiso; Traustedt, Vid. Medd. 1881, pp. 271–274, in Latin, p. 285, pl. iv. figs. 1–3, and pl. v. figs. 13 & 14.

Rhodosoma pyxis, sp. n., = ? *seminudum* (Heller), St. Thomas and St. Croix, West Indies; *id. l. c.* pp. 274 & 285, pls. iv. fig. 4, and v. fig. 15.

Corynascidia, g. n. Shape elongated, pyriform, pedunculated; aperture not lobed; test gelatinous or membranous. Branchial sac extremely delicate, internal longitudinal bars present, but not provided with papillæ, interstigmatic vessels coiled spirally. Dorsal lamina in the form of languets. Tentacles simple, filiform. Viscera on dorsal edge of branchial sac, running antero-posteriorly. Deep-sea representative of

Corella. *C. suhmi*, sp. n., Southern Pacific and Indian Ocean, lat. 33° and 46° S., 1375–1260 fath. Herdman, *Tunicata* of the 'Challenger,' pp. 186–189, pl. xxv.

Clavelinidæ.

Analytical table of the three known genera by Herdman, *l. c.* p. 239.

Clavelina lepadiformis (Müll.), formation of the egg and gemmation; Seeliger, *suprà*.

Clavelina oblonga, Bermudas, and *enormis*, Simon's Bay (Herdm., 1880), fully described; Herdman, *l. c.* pp. 245–248, pl. xxxv. figs. 3–10.

Ectinascidia (Herdm., 1880) *crassa*, Ki Island, *crassa*, Banda, and *turbinata*, Bermudas (Herd., 1880); *id. l. c.* pp. 239–245, pl. xxxvi.

Synascidiæ (Ascidiæ compositæ).

R. von Drasche, Zool. Anz. 1882, pp. 696 & 697, arranges the *Synascidiæ* as follows:—

Fam. 1. *Botryllidæ*: *Botryllus* and *Botrylloides*.
2. *Perophoridæ*: *Perophora*.
3. *Clavelinidæ*: *Clavelina* and *Diazona*.
4. *Chondrostachyidæ*: *Chondrostachys* and *Oxycorynia*, g. n.
5. *Distomidæ*: *Distoma*[*-us*] and *Distaplia*.
6. *Polyclinidæ*: *Aplidium* (including *Fragarium*, *Morchellium*, *Circinalium*, *Parascidia*, *Amaroucium*, *Synoicum*, *Sidnyum*, and *Sigillina*) and *Polyclinum*.
7. *Didemnidæ*: *Didemnum* and *Leptoclinum*.
8. *Diplosomidæ*: *Diplosoma*.

A. Della Valle has published several papers concerning the compound *Ascidiæ* of the Mediterranean (titles *suprà*), not seen by the Recorder.

Oxycorynia, g. n. Colony pedunculate, resembling a pine-apple, cloacal aperture entire, terminal, branchial aperture external, with eight tentacles; the single animals connected together by a very delicate common tunica. *O. fascicularis*, sp. n., Hogoleu, Caroline Islands; Von Drasche, *l. c.* pp 162 & 163, and J. R. Micr. Soc. (2) ii. p. 331. [Also in Verh. z.-b. Wien, xxxii. pp. 175–177, pl. xiii., which volume is on the cover stated to be published in March, 1883.]

Distaplia (Della Valle, 1881) is chiefly distinguished from other *Synascidiæ* by the presence of a cylindrical diverticle in the cloaca, in which the eggs are developed; in other respects it agrees with the *Didemniidæ*. Della Valle & Lacaze Duthiers, Arch. Z. expér. x. pp. xl.-xlii.

THALIACEA.

Doliolidæ.

C. Grobben has observed that the so-called rosette-shaped organ in *Doliolum* is a proliferous shoot (stolo prolifer), from which a number of pieces, which he thinks to be abortive buds, detach themselves spontaneously, and perish afterwards; he comes to the conclusion that in this

genus there are two different generations of nurses, the first of which produces three sorts of buds—(1) the abortive ones above mentioned, (2) lateral buds, which remain sterile, and (3) median, which give origin to the second generation of nurses; this latter is provided with a ventral stolo, and produces buds which become sexual animals. He comes to the conclusion that in *Doliolum* the alternation of generations is complicated with heterogony, the generation which is produced sexually producing abortive buds of the other kind of generation, but, at the same time, two other sorts of buds, one of which, the median, again produces the sexual form; in *Salpa*, the alternation is quite simple; in *Pyrosoma* and *Synascidiæ*, the same individual produces sexually and by budding; the sexually produced individuals remain asexual, and again produce by budding the first form (true alternation), and the asexually produced individuals are equivalent to their parents. Arb. z. Inst. Wien, iv. pp. 201–298, 5 pls., also separately; abstract in J. R. Micr. Soc. (2) ii. pp. 331 & 332.

B. Ulianin opposes this view, stating that the so-called dorsal and ventral stolo does not produce any bud at all, but serves only for the temporary fixation of the young animal; that the pieces detached from the rosette-shaped organ do not perish, but become amœboid, and fix themselves on another part of the parent animal; and, finally, that there is only one generation of nurses, which comes directly from the egg, and is provided with the rosette-shaped organ, producing by gemmation several different forms of buds—(1) the so-called lateral buds or shoots, (2) the median shoot or so-called second generation of nurses, and (3) the sexual animals. He tries to explain this strange mode of gemmation phylogenetically by comparison with the *Synascidiæ* and *Pyrosoma*. Zool. Anz. 1882, pp. 429–436 & 447–453, also in a separate paper in Russian (title *suprà*) with a plate; abstract in Arch. Z. expér. x. pls. liv.–lix.

Doliolum denticulatum (Q. & G.), *muelleri* (Krohn), and *rarum*, sp. n., = *muelleri* (Keferstein & Ehlers), Messina, sexual and asexual forms described and figured by Grobben, Arb. z. Inst. Wien, iv. (2) pp. 74–76, pls. i. figs. 1–6, ii. fig. 7, iii. figs. 14–18.

Salpidæ.

F. Todaro compares his former results as to the development of *Salpa*, Atti Acc. Rom. (3) iv. [1880], with those by Barrois and Salensky [Zool. Rec. 1881, *Moll.* p. 100], and adds some new observations supporting his views. The follicle is divided into two communicating sacs, the ovaric and the embryonic, succeeding each other in development. Todaro has seen the entry of a single zoosperm into the egg, its transformation into a pronucleus, and its conjugation with the female pronucleus; he also describes the segmentation of the egg in *Salpa pinnata* into the Morula stage, and the entry and gradual disappearance of the small lecythical or nutritive cells between the blastomeres. The embryonal sac adheres to the wall of the uterus, and the point of adhesion projects into the respiratory cavity, which is constituted by a dilated part of the embryonal sac, and a part of the wall of the uterus (decidua interna); after-

wards the embryonal sac disappears, and the embryo passes into the epithelial cavity of the uterus. Todaro comes to the conclusion that the development of *Salpa* is complicated by metamorphosis, and that the development of the first embryo or pro-embryo, and its relation to that of the following "true" embryos vary in different species; the preceding observations are made chiefly on *Salpa pinnata* (Forsk.). Atti Acc. Rom. Trans. vi. pp. 309–315.

W. K. Brooks maintains that the simple *Salpæ* are females, and produce the eggs, and that the aggregate are males, which carry with them the eggs produced by the preceding generation. Stud. Biol. Lab. Hopkins Univ. xi. No. 2; abstract in Arch. Z. expér. x. p. lxii., and Zool. Anz. 1882, pp. 212–215.

Appendiculariæ.

Metamerisation in the caudal muscles of *Fritillaria*; E. R. Lankester (*suprà*, in General Subject).

POLYZOA.

J. Barrois has published another paper on the embryogeny of the *Polyzoa*, urging chiefly the relations of the larva to the adult form; he recapitulates and discusses more particularly the principal parts of the larva and its metamorphosis in the type of the *Endoprocta* (*Pedicellina*), and several types of the chief divisions of the *Ectoprocta*, as *Lepralia*, *Bugula*, *Serialaria*, *Frondipora*, and *Discopora*, coming to the conclusion that the different forms of larvæ may be grouped and characterized as follows:—

1. *Endoprocta*: Predominance of the ab-oral surface, vestibule at the maximum; intestine well formed.
2. *Chilostomata* and *Cœnostomata* (sac reduced): Predominance of the circlet; pallial cavity; intestine reduced to a mass of globules.
3. *Cyclostomata* and *Lophopoda* (without sac): Predominance of the oral surface; pallial cavity in the maximum; intestine all but disappeared.

The metamorphosis in all of them begins with the immersion of the oral surface in the embryo, accompanied by an extension of the ab-oral surface, which spreads out so as to form the whole of the integument which will give origin to the definitive cell. The oral surface, entirely invaginated, divides into two completely different parts, one of which remains adherent to the base of the cell, while the second advances upwards to connect itself with the special invagination of the ab-oral surface (invagination of the hood in the *Ectoprocta*, labial thickening in the *Endoprocta*), and constitute with it the future polypide. In the *Endoprocta*, this second part, or superior division of the vestibule, is greatly developed, and consists of the median portion of the oral surface, which bears the incubatory pouch, and to which the intestine is suspended; it forms of itself almost the entire polypide, while the invagination of the ab-oral surface hardly gives origin to more than the aperture of the cell. In the *Ectoprocta*, the upper part of the wall of the vestibule only con-

sists of a small cellular mass eventually surrounding the principal portion of the polypide, of which it will form no more than the musculo-connective appendages; the essential part or epithelial lamella of the future polypide is here furnished entirely by the invagination of the ab-oral surface. In the adult Bryozoon, the author distinguishes from these data three surfaces: (1) the foot, corresponding to the oral pole, (2) the frontal surface, corresponding to the surface, which answers to the mouth, and (3) the tergal surface, corresponding to the anus, the two latter surfaces both forming parts of the ab-oral surface, which forms the entire integument; these three surfaces are easily recognized in the *Endoprocta*, and among the *Ectoprocta* in forms such as *Serialaria*, *Bugula*, &c.; in those forms which are spread out into a plate, such as *Escharina* and the majority of the *Chilostomata*, it is the tergal face whose growth always gives origin to the first bud. Finally, the author puts forwards the hypothesis that the *Polyzoa* may be derived by adaptation to sessile life from swimming organisms, free and probably analogous to the *Rotifera*, of which the few known larvæ of *Endoprocta* represent the sole survivors. J. de l'Anat. Phys. 1882, pp. 1–34; translated Ann. N. H. (5) x. pp. 265–279 & 388–403, pl. xiv.; abstract in J. R. Micr. Soc. (2) ii. pp. 492–494.

Notes on the origin and development of the sexual products in the chilostome *Polyzoa* by W. J. Vigelius, Biol. Centralbl. ii. pp. 436–442.

Popular description of the development of the *Polyzoa* by O. Taschenberg, Verwandlungen der Thiere, 1882, pp. 154–156.

In the ubiquitous *Microporella ciliata* (Pall.), the following forms of the avicularian organ occur: (1) Ordinary avicularium with pointed beak; (2) avicularium with the mandible elongated into a spine; (3) avicularium with the spinous mandible supporting a membranous flapper; (4) vibraculoid structure with tall well-developed seta and partially modified beak. Hence may be concluded that avicularium and vibraculum are the same organ, differently modified. Hincks, Ann. N. H. (5) ix. pp. 20–23, woodcuts.

W. A. Haswell has observed a *Cellepora*, from Torres Straits, having minute Actinids scattered over its branches and occupying the terminal portions of narrow canals in the substance of the bryozoarium; P. Linn. Soc. N. S. W., Nov. 1882.

H. Allen remarks on the tenacity of life exhibited by *Plumatella vesicularia*, Leidy, the growth of which was not interfered with by the presence of oxide of iron in the water; P. Ac. Philad. 1882, p. 223.

Fresh-water Polyzoa.

Bohemia. 1 *Cristatella*, 1 *Alcyonella*, 2 *Plumatella*, 1 *Fredericella*, and an undetermined species enumerated and described with some woodcuts by J. Kafka, SB. böhm. Ges. 1881, pp. 250–254.

Marine Polyzoa.

27 species, including 1 new, collected during the cruises of the Dutch steamer, 'Willem Barents,' in the Arctic Sea, enumerated by W. J. Vigelius, Niederl. Arch. Zool. Suppl. i. pt. 3, 20 pp. 1 pl.

Several species of *Polyzoa*, new or hitherto only known from the Shetland coasts or in the American seas, have also been found in the *Mediterranean* or on the South-west coasts of Europe by the dredgings on board the 'Travailleur'; Alphonse Milne-Edwarde, Ann. N. H. (5) ix. p. 44. List of 71 species dredged in the Mediterranean and of 28 dredged in the Atlantic; *id.* Rapport sur la faune sous-marine, pp. 20–22, 44 & 45.

Adriatic Sea. New *Polyzoa*; Piesser, J. R. Micr. Soc. (2) ii. p. 494.

Indian Seas, Australia, and *New Zealand.* Some new or less known *Polyzoa* described by T. Hincks, Ann. N. H. (5) ix. pp. 116–126 & x. 160–169, pls. vii. & viii.

Victorian Coast. Notes on living *Polyzoa*; J. R. Y. Goldstein, J. Micr. Soc. Vict. i. pp. 42–50 [May, 1880].

Two new species of *Catenicella* by Goldstein & C. M. Maplestone, respectively, *tom. cit.* pp. 63 & 64, pl. v. figs. 1–4.

Queen Charlotte Islands, N. Pacific. 52 species of *Polyzoa*, including several new; T. Hincks, Ann. N. H. (5) x. pp. 248–256 & 459–471, pls. xix. & xx.

Two papers by A. W. Waters may be mentioned here, of which the first is "On Fossil Chilostomatous *Bryozoa* from Mount Gambier, South Australia," J. G. Soc. xxxviii. pp. 257–276, pls. vii.-ix., and the second, *l. c.* pp. 502–513, pl. xxii., is "On Chilostomatous *Bryozoa* from Bairnsdale (Gippsland)." 127 species are noticed, 52 of which are now found also living, three fourths of them in Australia; 31 are considered to be identical with European tertiary species. Abstract in Ann. N. H. (5) x. pp. 67 & 175. The author calls attention to the frequency with which the Australian *Polyzoa* exhibit different modes of growth.

CHILOSTOMATA.

Catenicellidæ.

Catenicella. 12 fossil species from the Miocene tertiary near Geelong; J. B. Wilson, J. Micr. Soc. Vict. i. pp. 60–63 [May, 1880].

Catenicella ponderosa, J. R. Y. Goldstein, *tom. cit.* p. 63, pl. v. figs. 1–3, Victorian Coast, alive in 6 fath.; *C. pulchella*, C. M. Maplestone, *tom. cit.* p. 64, pl. v. fig. 4, Williamstow, Victoria: spp. nn.

Eucratiidæ.

Rhabdozoum, g. n. Zoarium erect, phytoid, composed of numerous celliferous shoots, held together by a ramified stem made up of bundles of radical fibres given off from the inferior portion of the shoots; celliferous shoots consisting of a cylindrical bi- or tri-furcate stem, which gives origin to the radical fibres and also to erect chitinous roods, on the summits of which are borne two or three similar stems, more or less dichotomously divided; zoœcia pyriform, ranged in linear series round an imaginary axis, so as to form cylindrical stems, each cell rising from

behind the top of the aperture of the one below it ; aperture moderately large, subterminal, oblique ; avicularia not capitate. *P. wilsoni*, sp. n., off Port Phillip Head, Victoria ; Hincks, Ann. N. H. (5) x. pp. 160–163, pl. viii. fig. 4.

Didymia simplex (Busk), M'Coy, Nat. Hist. of Vict., Decade v. [1880] pl. xlvi. fig. 6.

Dimetopia spicata and *cornuta* (Busk), *id. l. c.* pl. xlvi. figs. 4 & 5.

Calwellia bicornis, id. *l. c.* pl. xlvi. fig. 7, Australia.

Cellulariidæ.

Menipea ternata (Ell.) var. *gracilis* (Smith), Vigelius, Bryoz. 'Willem Barents,' p. 9, pl. i. fig. 1, Arctic Sea.

Menipea compacta, sp. n., Hincks, Ann. N. H. (5) x. p. 461, Queen Charlotte Islands.

Scrupocellaria varians and *brevisetis*, spp. nn., *id. ibid.*, the former pl. xix. fig. 1, Queen Charlotte Islands.

Bicellariidæ.

Diachoris magellanica (Busk) and *spinigera* (Macg.), M'Coy, *l. c.* pl. xlvi. figs. 2 & 3.

Cellariidæ.

Cellaria mandibulata, sp. n., Hincks, *l. c.* p. 463, Queen Charlotte Islands.

Cellaria. 4 Australian species figured ; M'Coy, *l. c.* pl. xlix. figs. 1–4.

Nellia oculata, id. *l. c.* pl. xlix. fig. 5.

Tubucellaria (Orb.) = *Onchopora* (Busk), *hirsuta* (Busk), *id. l. c.* pl. xlix. fig. 6, Australia.

Flustridæ.

Flustra dentigera, sp. n., Hincks, Ann. N. H. (5) ix. p. 116, pl. v. fig. 7, West Australia.

Flustra reticulum, sp. n., *id. op. cit.* x. p. 163, pl. vii. fig. 1, off Port Phillip Head, Victoria.

Flustra, 1, and *Carbasea*, 4 Australian species figured ; M'Coy, *l. c.* pl. xlv.

Euthyris, g. n. Zoarium corneous, erect, foliaceous. Zœcia with raised margins ; aperture closed in by a membranaceous or membrano-calcareous wall ; orifice surrounded by a chitinous border ; oval valves furnished with a distinct hinge. *E. obtecta*, sp. n., North Australia. Hincks, *l. c.* pp. 164 & 165, pl. vii. fig. 1.

Spiralaria floccosa (Busk) ; M'Coy, *l. c.* pl. xlvi. fig. 1.

Membraniporidæ.

Membranipora pilosa (L.) form *foliacea* from New Zealand ; Hincks, *l. c.* p. 169—var. n. *multispinata*, West Australia, and remarks concerning

M. variegata and *coronata*; id. *op. cit.* ix. pp. 117 & 118, the former pl. v. fig. 6.

Membranipora minax (Busk), North of Spain and Mediterranean, assuming the external form of *Biflustra*; A. Milne-Edwards, Rapp. faune sous-marine, p. 45.

M. avifera (Macgill.) var. n. *multispinata*, *sophiæ* (Busk) var. n. *matura*, *membranacea* (L.), var. n. *serrata*, and *M. echinus*, *exilis*, *nigrans*, *levata*, *conferta*, *protecta*, *corniculifera*, and *minuscula*, spp. nn., Queen Charlotte Islands; *id. l. c.* pp. 248–250, 256, & 465–469, pl. xix. figs. 2–6, and pl. xx. figs. 1–4.

Microporidæ.

Steganoporella (*Vincularia*) *neozelanica* (Busk), occurring in 2–3 different forms, some spreading in a simple layer, others erect, cylindrical and of Vincularian mode of growth; also *S. smithi* (Hincks), known as an incrusting form, both fossil and recent, assumes the habit of *Vincularia* on the coast of Australia. This habit is therefore a condition that may be assumed by the most diverse species, and *Vincularia* has no generic status. A list of the known species of *Steganoporella* is added. Hincks, *op. cit.* ix. pp. 119–123, pl. v. figs. 9, 9*a*, & 9*b*.

Cribrilinidæ.

Cribrilina furcata and *hippocrepis*, spp. nn., Hincks, *op. cit.* x. pp. 250, 251 & 470, 471, pl. xx. figs. 5 & 6, Queen Charlotte Islands.

Setosella vulnerata (Busk) and *richardii* (Folin), North of Spain, found with ovicells at a depth of 1068 and 896 metres; Alph. Milne-Edwards, Rapp. faune sous-marine, p. 45.

Microporellidæ.

Microporella ciliata (Pall.), different forms of avicularium; see *suprà*, p. 110.

Monoporellidæ.

Monoporella albicans, sp. n., Hincks, *op. cit.* ix. p. 123, pl. v. fig. 5, Singapore or Philippines.

Myriozoidæ.

Schizoporella incrassata, Africa, on coral, *levata*, Australia, on weed, and *aperta*, Singapore or Philippines, on shell, spp. nn., Hincks, *l. c.* pp. 124–126, pl. v. figs. 1, 4 & 5.

Schizoporella conservata (Waters), and *latisinuata*, sp. n., *id. op. cit.* x. pp. 165 & 166, pl. vii. figs. 2 & 3. Off Port Phillip Heads, Victoria—*S. crassilabris*, *longirostrata*, *insculpta*, *maculosa*, *tumulosa*, *dawsoni*, and *fissurella*, spp. nn., *id. l. c.* pp. 251–253, Queen Charlotte Islands.

Escharidæ.

Eschara solida (Stimps.) = *palmata* (Sars); Vigelius, Bryoz. 'Willem Barents,' p. 15, pl. i. figs. 2 & 3.

Caleschara, g. n. Polyzoarium expanded, foliaceous, erect, not perforated. Cells horizontal, opening on both surfaces, separated by raised lines, and depressed in the centre. Front calcareous, except a small part posteriorly, which is membranaceous. *C. denticulata* (Macg., *Eschara*, 1869), Australia; M'Coy, Nat. Hist. of Vict., Decade v. [1880] pl. xlviii. fig. 8.

Lepralia striatula, sp. n., Hincks, *op. cit.* x. p. 166, pl. viii. fig. 1, Zanzibar; *L. bilabiata*, *nitescens*, and *claviculata*, spp. nn., *id. l. c.* pp. 253 & 254, Queen Charlotte Islands.

Lepralia. 23 Australian species figured; M'Coy, *op. cit.* iv. [1879] pls. xxxv.–xxxviii.

Porella rostrata (Hincks), œcium described; Hincks, *op. cit.* ix. p. 126.

Smittia spathulifera, sp. n., *id. op. cit.* x. p. 255, Queen Charlotte Islands.

Macronella diaphana (Macg.) forma *armata*, New Zealand; *M. vultur*, sp. n., Australia, *præstans*, sp. n., New Zealand, and *rotundata*, sp. n., Singapore or Philippines; *id. l. c.* pp. 167–169, pls. vii. fig. 6, viii. figs. 2, 3 & 5. *M. prælucida* and *prælonga*, spp. nn.; *id. l. c.* p. 255, Queen Charlotte Islands. *M. abyssicola* (Norm.), red in life, North of Spain; Alph. Milne-Edwards, Rapp. faune sous-marine, p. 46.

Dictyopora cellulosa (Macg.); M'Coy, *op. cit.* v. [1880] pl. xlvii. fig. 1, Australia.

Celleporidæ.

Cellepora senegambiensis, sp. n., Carter, Ann. N. H. (5) ix. p. 416, pl. xvi. fig. 1*a–c*, Coast of Senegambia.

CYCLOSTOMATA.

Tuburiporidæ.

Mesenteripora repens, sp. n., off Broughton Islands, near Port Stephens, New South Wales, attached to the laminæ of *Biflustra*, or the branches of *Cellepora*; Haswell, P. Linn. Soc. N. S. W. vi. pp. 199–202.

Frondipora reticulata (Blainv.), note on its ovicells; Alph. Milne-Edwards, Rapp. faune sous-marine, p. 23.

Cerioporidæ.

Heteropora, a recent species, probably *pelliculata* (Waters), found in the Strait of Juan de Fuca; Whiteaves, Am. J. Sci. (3) xxiv. pp. 279 & 280.

Crisiidæ.

Crisia. 5 Australian species figured; M'Coy, *op. cit.* iv. [1879] pl. xxxix.

CTENOSTOMATA.

Cylindrocium giganteum (Busk) found in the Mediterranean, 40–80 metres; Alph. Milne-Edwards, Rapp. faune sous-marine, p. 22.

LOPHOPODA.

Plumatella vesicularis (Leidy), vitality; Allen, P. Ac. Philad. 1882, p. 223.

Fredericella sultana (Blumenb.), statoblast; J. Kafka, SB. böhm. Ges. 1881, p. 253, woodcut.

Undetermined genus, hyaline mass like *Lophopus*, with statoblasts like those of *Plumatella*, observed at Podebrad, Bohemia; *id. l. c.* p. 254.

Cristatella mucedo (Cuv.), statoblast; *id. l. c.* p. 251, woodcut.

ENDOPROCTA.

Pedicellinidæ.

Loxosoma nitschii, sp. n., Vigelius, Bryoz. 'Willem Barents,' p. 19, pl. i. figs. 4 & 5, Barents' Sea, on *Menipea ternata*.

Barentsia bulbosa (Hincks), anatomically investigated; stolo and erected branches chitinous, without muscles, except a limited terminal part of the latter; the cup-like trunk is separated from those branches by a distinct diaphragma. *Id.* Zool. Anz. 1882, pp. 141–144.

PTEROBRANCHIA.

Rhabdopleuridæ.

Cephalodiscus, g. n. Concœcium consisting of a massive irregularly-branched fucoid secretion, resembling chitine, hispid with long spines of the same tissue, and honeycombed throughout by irregular apertures, channels, and spaces, in which the separate and independent polypides occur singularly or in groups. Lophophore richly plumose, with an enormous buccal shield and large oral lamella, the mouth opening between the two. Anus on the anterior dorsal prominence, behind the plumes. Two large eggs abutting on the ovaries towards the anterior part of the body. The homologue of the funiculus is short and quite free, its tip serving for the development of buds. *C. dodecalophus*, sp. n., Strait of Magellan, 245 fath. W. C. M'Intosh, Rep. Br. Ass. 1882 [1883]. pp. 596 & 597, and Ann. N. H. (5) x. pp. 337–348.

CRUSTACEA.

BY

PROF. EDUARD VON MARTENS, M.D., C.M.Z.S.

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[There is a mistake in the title; not the *Copepoda*, but the *Ostracoda* from New Zealand, described by Brady in the Zoology of the 'Challenger' Vol. i., part iii., 1880, see Zool. Rec. xvii., *Crust.* pp. 49–53, are here extracted.]

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WINKLER, T. C. Carcinological investigation on the genera *Pemphix*, *Glyphea*, and *Araeosternus*. Ann. N. H. (5) x. pp. 133–149 & 306–317.

WRIGHT, R. RAMSAY. Notes on American Parasitic *Copepoda*. P. Canad. Instit. i. pp. 243–254, pls. i. & ii.

GENERAL MORPHOLOGY.

J. E. V. BOAS publishes a paper on the systematic relations of the *Malacostraca*, based chiefly on his own researches on the structure of the dermal skeleton; he thinks that all *Malacostraca* can be derived from the *Phyllopoda*, and may be grouped into the following 7 orders: *Euphausiacea*, *Mysidacea*, including *Lophogaster*, *Cumacea*, *Isopoda*, and *Amphipoda*, these 5 forming a nearly continuous ascending row, whereas the 2 remaining, *Decapoda* and *Squillacea*, are divergent branches, taking their origin near the *Euphausiacea*. He introduces a new term, "cormopods," for the maxillipeds or gnathopods and thoracic feet or periopods altogether, and he excludes the first pair of antennæ (antennulæ) from the number of typically homologous extremities. He also reviews the various modifications and appendages of those extremities, and compares the whole external structure of his seven orders of *Malacostraca* from a phylogenetic point of view, urging more particularly the relations of the *Isopoda* to the *Mysidacea*, and regarding the family *Tanaidæ*, especially the genus *Apseudes*, as a connecting point between them. Finally, he gives a short diagnostic description of each Order. The plates contain the first cormopod, and first and second maxilla of *Nebalia* with representatives of the other Orders for comparison, besides some other particulars. Morph. JB. viii. pp. 485–579, pls. xxi.–xxiv.

M. HARTOG comes to the conclusion that the caudal furca of the Copepods, etc., is an outgrowth of the last segment, and not strictly comparable to the limbs, and that the telson of the higher *Crustacea* is equivalent to the last segment of the *Nauplius* stage, together with a greatly developed post-anal portion, composed of the supra-anal plate and the aduate furcal processes. Rep. Brit. Ass. 1882 [1883], p. 575, woodcut.

PACKARD gives a morphological comparison of the lateral appendages of the *Crustacea*, starting from the *Phyllopoda*, and including also the *Trilobites* and *Limulus*, with numerous woodcuts; Am. Nat. xvi. pp. 785–799. He also proposes the term "gonopoda" for the basal abdominal feet of male *Decapoda*, used as accessory reproductive organs, and "cercopoda" for the jointed anal appendages of *Apus*; l. c. p. 677.

GERSTÄCKER, see *Isopoda*.

1. *Nervous System and Organs of Sense.*

Notes on the brain of the *Crustacea*, by Packard, Am. Nat. xvi. pp. 588 & 589 ; abstract in J. R. Micr. Soc. (2) ii. p. 502.

Microscopical researches on the nervous fibres and cells in the common crayfish, by S. Freud, SB. Ak. Wien, lxxxv., Abth. 3, pp. 9-46. The cells consist, according to him, of two substances : one reticular, which is continued into the fibrillæ of the nerves ; and another homogeneous, which is continued into the interfibrillar substance of the nerves ; amœboid bodies have been observed within the nucleus of the cells.

Some observations on the physiology of the nervous system in the common crayfish, by E. Reichenbach, Humboldt, i. pp. 26 & 27.

The nervous system of *Palæmonetes varians* is described by A. Garbini, Atti Soc. Ven. Trent. vii. pp. 179–199, 6 pls.

G. Bellonci describes the nervous system and the organs of sense of *Sphæroma serratum* (Latr.), Atti Acc. Rom. (3) x. pp. 91–104, and also in Arch. Ital. Biol. i. pt. 2, pp. 176–192. He describes its external and microscopical structure, and comes to the conclusion that the brain of the *Crustacea* fully agrees morphologically with that of the *Insecta*; the inner lobes of the uppermost part in the former are homologous to the mushroom-shaped bodies of the latter, the central reticular substance of the former to the fan-shaped part of the latter, the lateral protruding parts of the former to the olfactory lobes of the latter. The author further describes the hairs and other cuticular prominences which he assumes to be sensorial. The same author gives notes on the nervous system of *Squilla mantis* ; Rend. Acc. Bologn. 1881–82, p. 66, and Mém. Acc. Bologn. (4) iii. 2 pls.

A. Fric gives some notes on the structure and development of the nervous system in the Copepods; Zool. Anz. 1882, pp. 498–501.

An unpaired eye, in addition to two compound eyes, is found in many *Crustacea*, and without the two latter in the *Copepoda* and the nauplii-form larvæ of all Orders ; it contains three lenticular bodies or crystalline spheres, each of which is composed of radiating elements or optical bacilli, the inner ends of which are applied against a pigmented mass, while the peripherical segments contain a nucleus ; the nerve, instead of penetrating into the pigmented mass, skirts the outer surface of the crystalline sphere, and penetrates it directly. It may therefore be said to be composed of three simple eyes, with reversed optical bacilli, receiving conductive fibres of the optic nerve upon their outer margin. A nearly identical structure of the eye is found in the *Chætognatha* and in some Planarians. M. Hartog, C. R. xciv. pp. 1430–1432 ; abstract in Ann. N. H. (5) x. pp. 70 & 71, Arch. Z. expér. x. pp. vii. & viii., J. R. Micr. Soc. (2) ii. p. 504, and Le Nat. 1882, No. 18, p. 138.

Sir J. Lubbock's observations concerning colour sense in *Crustacea* [Zool. Rec. xviii. *Crust.* p. 5] are also reported in J. R. Micr. Soc. (2) i. pp. 882–884. The author confirms by several experiments his statement that *Daphnia* is sensible to ultra-violet rays; J. L. S. xvi. pp. 121–127.

2. *Muscular System.*

Anastomoses between the primitive fibrillæ of the transversely striated muscles have been observed in *Gammarus*, *Corophium*, and *Ligia*, by Jousset de Bellesme, C. R. xcv. p. 1003.

3. *Digestion.*

The "pyloric ampullæ" in the stomach of the stalk-eyed *Crustacea* are the subject of a paper by F. Mocquard. They are semi-cylindrical enlargements of the wall of the stomach, filled with longitudinal bristle-bearing crests with fine channels between, and serve to sift the nutritive substances from those which are mechanically unfit for nourishment; the former, after having passed through the channels, come to the spot where the ducts of the so-called liver open into the intestinal tract, and chemical digestion then begins. These ampullæ are nearly alike in all *Decapoda* and *Stomapoda*, which have been examined, also in the larva of the lobster, but they are wanted in the *Mysidæ*. C. R. xciv. pp. 1208–1211.

The armature of the stomach of *Birgus latro* is described by F. Mocquard. The median tooth and the lateral teeth are very strong, and there is in the antero-lateral wall on each side a large cartilaginous substance, provided with 9–11 strong calcareous points, terminating in long bristles; in their natural situation these close the entry of the stomach, but when they are separated by the powerful antero-lateral dilating muscles, the cavity of the stomach is much enlarged, and the contents of the mouth and œsophagus are attracted by suction. Ann. Sci. Nat. (6) xiii., Art 3.

Notes on the intestinal tract and its glands in the fresh-water Copepods, by A. Fric, Zool. Anz. 1882, p. 501.

4. *Circulation.*

G. Pouchet makes some observations on the blood of the *Crustacea*; J. de l'Anat. Phys. xviii. pp. 202–204; abstract in J. R. Micr. Soc. (2) ii. pp. 504–506. The blood of the *Crustacea* is, according to him, highly salted; the blood-cells are very variable in shape, but not amœboid as long as they are within the blood-vessels.

A. Fric states the presence of amœboid lymphatic corpuscles in the [illegible]ater Copepods; Zool. Anz. 1882, p. 502.

5. *Secretion and Excretion.*

[illegible] states the existence of segmental organs in the terrestrial *Iso-*[illegible] They are unicellular agglomerated glands, opening on each side in all segments of the perion and pleon in the upper part of the epimera; some cells are very large (15 mm). They have been described as caudal glandular organs by Lereboullet. In *Porcellio pictus*, they are only found in the pleon and in the aquatic *Isopoda*, as *Ligia* and *Asellus*, they are totally wanting. C. R. xciv. pp. 810 & 811; abstract in J. R. Micr. Soc. ii. pp. 337 & 338.

6. *Generation and Development.*

The literature on development of *Crustacea* is enumerated by W. Faxon, Bull. Mus. C. Z. ix. No. 6, pp. 197–250.

The three different modes of segmentation known hitherto in the *Crustacea* and *Decapoda* are discussed, and a fourth, viz., division of the nucleus in 16 parts, and afterwards formation of 16 cells on the outside of the yelk, observed in *Callianassa*, described by C. v. Mereschkowski, Zool. Anz. 1882, pp. 21–23, woodcut; abstract in Arch. Z. expér. x. p. xv.

Popular description of the metamorphosis of several *Crustacea*, by O. Taschenberg, Verwandlungen der Thiere, Leipzig: 1882, pp. 106–121, 11 woodcuts.

Metamorphosis of *Alpheus*; W. Brooks, in J. Hopkins Univ. Circul. No. 17, p. 247.

T. Tullberg, Sv. Ak. Handl. xix. No. 3, pp. 5–12, pl. i., discusses the structure and development of the cephalothorax of *Homarus vulgaris*, coming to the following conclusions:—

1. The greatest part of the chitinous integument is formed by successive transformation of the outer parts of the cells of the matrix, these cells splitting into fibres, and depositing at the same time a stratified intermediate substance between them.

2. The outermost layer, which is not transversely striated, has its origin probably also in the transformation of the cells of the matrix, with or without previous formation of fibres.

3. The intimate connection of the chitinous integument with its matrix is caused by the cells themselves growing into the shell.

4. The so-called pore-channels are not situated within the fibres nor can they be seen beside them in a transverse section; they have a very irregular aspect and originate probably during the drying of the shell.

7. *Moulting.*

A. N. Vitzou has examined the minute structure and chemical composition of the integuments of the Decapods before, during, and after the moult; and comes to the conclusion that the chitinous shell is formed by the thickening of the external walls of the cells, the epithelium of which becomes chitinogene, that glycogene is always present in the skin, but more copiously during the moult, and that it may serve as [illegible] material for the new formation of the organic parts of the skin, organic materials being accumulated in the crayfish and lobster [illegible] is called the lateral wall of the stomach, in other *Decapoda* in [illegible] phatic fluid itself. Arch. Z. expér. x. pp. 431–577, pls. xxiii.–xx[illegible]

F. Mocquard publishes some observations on the solution of continuity in the apodemes caused by the moult. C. R. xcvi. pp. 204 & 205.

8. *Biology.*

L. Fredericq states that the loosening of the limbs in *Carcinus mænas* is confined to distinct joints, where it occurs spontaneously, if any vio-

lence is applied to the neighbouring distal part of the foot, by reflexive movement. Arch. Biol. iii. pp. 235-240.

C. Matzdorff has published some very interesting observations on the variability of colour in *Idotea tricuspidata* (Desh.), enumerating and figuring a number of varieties in colour, and stating that they are not confined to sex. He further states that the same individual changes its colour by expansion or contraction of dark brown chromatophorous cells, and that its general coloration becomes in that way lighter or darker if confined in a light or dark coloured vessel. Individuals creeping near the tip of *Algæ* or Hydroids on their natural dwelling-places are usually more pale-coloured ; those remaining on the ground rather dark, and by preference females. After the extirpation of both eyes, the animals do not change colour. Diss. inaug. (title *suprà*), also in Jen. Z. Nat. xvi. pp. 1–58.

Adaptation of colour in *Carcinus mœnas* ; Carrington & Lovett, Zool. 1882, pp. 12–14.

Incidental observations concerning the feeding of some Crabs and *Paguridæ*, by A. E. Verrill, Am. J. Sci. (3) xxiv. pp. 360 & 447.

R. Kossmann, Zool. Anz. 1882, p. 60, gives a tabular review of the parasitical *Crustacea*, as follows :—

I. *Diosmotici* : not themselves digesting, but taking nourishing fluids direct from the body of their host. *Rhizocephala.*

II. *Sedentarii* : themselves digesting, but in the adult state not able to change their host. *Bopyridæ*, *Entoniscidæ*, *Cryptoniscidæ*, and part of *Copepoda.*

III. *Vagantes* : digesting, and changing the host also in adult state. *Cymothoidæ*, *Argulus*, and part of *Copepoda.*

Note on the commensalism of *Pagurus* and *Adamsia* ; H. Eisig, Das Ausland, lv. pp. 681-686.

Alpheus comatularum, *Gebia deflexifrons*, and an undescribed Cymothoid, as commensals of *Comatula* ; Haswell, P. Linn. Soc. N. S. W. vi. p. 763.

Geographical Distribution.

1. *Land and Fresh-water Crustacea.*

F. A. Forel recapitulates the principal features of the pelagic fauna of fresh-water lakes, enumerating the species of *Crustacea* which are most characteristic of it. These are widely distributed over the European fresh-water lakes from Sweden to Italy, and are all well adapted for swimming, and of pellucid colour, feeding either on swimming *Algæ* or an animal prey ; they perform daily migrations, being during night at the surface, and descending during the day as far down as 100 and even 150 metres. He thinks that most of them may be derived from allied forms which inhabit the littoral regions of lakes, but that, once adapted to a pelagic life, their eggs may be transferred by water-birds to other lakes, which will account for their wide geographical distribution, and their occurrence in lakes of rather recent origin. *Leptodora* and *Bythotrephes* alone have no near relation to littoral fresh-water species, and for these

two he suggests, like Pavesi, a marine origin. Biol. Centralbl. ii. p. 299; translated in Ann. N. H. (5) x. pp. 320–325, and Nature, No. 682, p. 92.

Province Jemtland, Northern Sweden. *Oniscus asellus* (L.) and 8 species of parasitic *Crustacea* living on fresh-water fishes, enumerated by Olsson, Œfv. Ak. Förh. xxxix. No. 10, p. 52. It has been endeavoured to acclimatize *Astacus fluviatilis* in Lake Lillsjö; *id. ibid.*

Lago di Toblino, S. Tirol. *Cyclops serrulatus* (Fischer) and *Bosmina longirostris* (Müll.), observed by P. Pavesi, Atti Sol. Ital. xxv. p. 145.

Lake Michigan. *Entomostraca*, 2 new genera and 7 new species; S. A. Forbes, Am. Nat. xvi. pp. 537–542 & 640–649.

Wisconsin. List of *Crustacea*, with some new species, by W. F. Bundy, Tr. Wiscons. Ac. v. p. 177.

Illinois. List of 12 species of fresh-water *Macrura* (including 10 *Cambaras*, 1 *Palæmon*, and 1 *Palæmonetes*), 4 Amphipods, 3 Isopods, 1 Phyllopod, and 2 Copepods (several new species), by A. Forbes, Illinois Museum, Bull. i. [1876] pp. 1–24. List of species of *Crustacea*, 1 Decapod, 2 Amphipods, 1 Isopod, 6 *Cladocera*, and 2 *Copepoda*, found in stomachs of fresh-water fishes; *id.* Illinois State Laboratory, Bull. ii. [1878], pp. 87–89.

Island S. Thomé, W. Africa. 2 terrestrial crabs and 1 terrestrial hermit crab, 1 fresh-water crab, and 2 fresh-water *Macrura*, 4 of them occurring also in the West Indies (see *Gecarcinus*, *Cardisoma*, *Atya*, *Palæmon*), observed by R. Greef, SB. Ges. Marburg, 1882, pp. 35–40.

A fresh-water species of *Elamena*?, found in Lake Pupuke, Auckland, New Zealand; Chilton, Tr. N. Z. Inst. xiv. p. 172. [This genus belongs to the family of the *Pinnaterida*, which has not hitherto yielded any fresh-water species.—Rec.]

P. Pavesi has observed in sulphurated springs at Stabio, a species of *Cyclops*, probably *C. clausi* (Heller), and in ferro-sulphurated water at Paraviso, *Cypris ovum* (Jur.), *candida* (Müll.), *Cyclops crassicornis* (Müll.), *Amymone satyra* (Müll.); Rend. Ist. Lomb. (2) xiv.

2. *Cave Fauna.*

Caves of Carniolia. 1 *Branchipus*, 1 *Estheria*, 1 *Leptodora*, 1 *Cypris*, 2 *Cyclops*, all new and eyeless, 3 species of *Niphargus*, 3 of *Titanethes*, 1 *Typhloniscus*, new, 1 *Monolistra*, 1 *Troglocaris*, and 1 new *Cambarus* [*Astacus*?], enumerated by G. Joseph, B. E. Z. xxvii. pp. 1–13.

Nickajack Cave, Tennessee. 3 species of *Crustacea*, congeneric with, but specifically distinct from, those of Mammoth Cave, described by E. Cope and A. Packard, Am. Nat. xv. [1881], pp. 879–882, pl. vii.

F. Vejdovsky, in his treatise, "Thierische Organismen der Brunnenwässer von Prag" (1882, large 4to), pp. 52–66, pls. vii. & viii., publishes some very interesting observations concerning the *Crustacea* found in the wells of the city of Prague. Several species of *Cyclops* (see *infrà*) are rather common; *Diaptomus* and *Canthocamptus* sometimes occur, and have the same colours as those living in other water. *Cypris eremita*, sp. n., on the contrary, is white and eyeless; *Candona candida* (Müll.) occurred once, but only females; *Chidorus sphæricus* (Müll.), found once in one well, was

probably brought there with river sand. *Gammarus puteanus* (Koch) is common ; *Asellus cavaticus* has not been found. A new genus *Bathynella* (infrà).

New Zealand. 3 new species of *Amphipoda* and a new genus of *Isopoda* (*Cruregens*), all without distinct eyes, subterranean, from a well at Eyreton, North Canterbury, New Zealand, described and figured by C. Chilton, Tr. N. Z. Inst. xiv. pp. 174–180, pls. ix. & x.

3. *Seas of Europe.*

Arctic Sea. 73 species of *Crustacea*, including 17 *Decapoda* and *Cumacea*, 10 *Isopoda*, 43 *Amphipoda*, and 3 *Cirripeda*, collected in the Arctic Sea during the cruises of the Dutch ship, 'Willem Barents,' are enumerated and partly described by P. P. C. Hoek, Niederl. Arch. Zool., Suppl. i. pt. 3, 57 pp., 3 pls. Those figured will be mentioned in the special part.

Norway. G. O. Sars enumerates the Norwegian *Podophthalma*, *Cumacea*, *Isopoda*, and *Amphipoda*, 576 species, including 107 not before known from Norway, and among the *Amphipoda* many new species ; Forh. Selsk. Chr. 1882, No. 18, pp. 1–24, pls. i.–vi.

Bohuslän, Sweden. List of 36 small species of *Crustacea* (3 *Mysidæ*, 7 Amphipods, 1 Isopod, 13 Copepods, 3 *Cladocera*, 7 *Ostracoda*), observed during the winter in the sea, by C. A. Hansson, Œfv. Ak. Förh. 1882, No. 7, pp. 75–80. Several Copepods which live parasitically on *Mollusca* and *Tunicata* observed by C. W. S. Aurivillius, *op. cit.* No. 8, pp. 41–117, pls. xiii.–xvi.

4 species of *Balanidæ*, 5 *Lepadidæ*, and 8 *Peltogastridæ*, from Bohuslän, by A. W. Malm, Göteb. Mus. Arsskr. 1881, pp. 26–32.

Kiel. 23 species of free Copepods described by W. Giesbrecht [title, see *suprà*].

British Seas. J. T. Carrington and E. Lovett give an interesting account of the British stalk-eyed *Crustacea*, with numerous original observations on their occurrence and biology ; introduction, terminology) and *Oxyrrhyncha*, in Zool. 1881, the rest of the *Brachyura* and the *Paguridæ* in 1882 ; the species will be mentioned *infrà*.

Mediterranean and *Atlantic Coasts of S. W. Europe.* Summary report upon dredgings on board the 'Travailleur,' mentioning from the Mediterranean a number of species of *Crustacea* hitherto only known from the Atlantic, by Alphonse Milne-Edwards, C. R. vol. xcv. [1881] pp. 876 & 921, Ann. N. H. (5) ix. pp. 37–46, and Rapp. sur la faune sous-marine, pp. 16–18 & 39–42. List of 29 *Ostracoda* from the Bay of Biscay, *id. l. c.* p. 42.

Preliminary note on deep-sea dredging in the Mediterranean in July and Sept., 1881, mentioning several *Crustacea*, and among them the genus *Willemoesia* ; E. H. Giglioli, Ann. Sci. Nat. (6) xiii., Art. 6.

L. Joliet's observations on Mediterranean *Crustacea* ; Arch. Z. expér. x. pp. 101–120, pl. vi., relate to a new species of *Lamippe* and *Pontonia*, and the habits of *Dromia* and *Ethusa*.

Adriatic. 4 species of *Bopyridæ*; Walz, Arb. z. Inst. Wien, iv. 2, pp. 125–200 (see special part).

4. *East Coast of North America.*

Southern Coast of New England. Result of dredging in 1882; A. E. Verrill, Am. J. Sci. (3) xxiv. p. 364. Several species of *Crustacea*, found copiously during the dredgings of the two preceding years, were not found in 1882, probably because the narrow warm zone of water was disturbed and practically obliterated by storms; *id. l. c.* p. 366, and Ann. N. H. (5) x. p. 479.

S. I. Smith describes the Decapods dredged on the East Coast of the United States in 1880 by the U. S. steamer 'Blake.' There are only 8 species of *Brachyura*, among which some rather northern littoral species, as *Cancer irroratus* (Say) and *borealis* (Stimps.), have been found south of Cape Hatteras in deep water, 9 species of *Anomura*, but 29 of *Macrura*, including many new species and several rare or new genera, some characterized by a membranaceous, very soft, and thin integument. Bull. Mus. C. Z. x. pp. 1–108, pls. i.–xvi.

5. *West Africa.*

List of 9 species of marine *Crustacea* known from the Mediterranean, caught during the expedition of the Prussian steamer 'Gazelle' on the West Coast of Africa, between 4° and 16° N. lat., in 38–59 fath., enumerated by T. Studer, Zool. Anz. 1882, p. 335.

Gorée and *Rufisque*, near the Senegal mouth. Notes on some crabs collected by Baron Von Maltzan; F. Hilgendorff, SB. nat. Fr. 1882, pp. 22–24.

6. *Indian Sea and Pacific.*

Madagascar. 60 species enumerated with some special remarks by H. Lenz & P. Richters, Abh. senck. Ges. 1882, 15 pp. 1 pl.

Mauritius. Some new or rare marine *Crustacea* mentioned and described by E. J. Miers, P. Z. S. 1882, pp. 339–342 & 538–543, pls. xx. & xxxvi. See genera *Naxia*, *Palinurus* (*longimanus*, identical with a species of the West Indies), *Pseudibacus*, and *Callianassa*.

Coast of China. Incidental notes on *Crustacea* used as food, and their capture, by A. Fauvel, Mém. Soc. Cherb. xxxiii. pp. 31, 56, 137 & 196.

Japan. Some notes on the occurrence of marine *Crustacea* in the Bay of Yeddo and Sagami, by Doederlein, Arch. f. Nat. xlix. pp. 104, 11[illegible] & 117.

The *Phronimidæ* of the Pacific, collected by the North Pacific Surveying Expedition, are discussed by T. Streets, P. U. S. Nat. Mus. v. pp. 3–9, pl. i.

New South Wales, *Victoria*, and *Tasmania*. New marine *Isopoda*, by Haswell, P. Linn. Soc. N. S. W. vi. pp. 181–196, pls. iii. & iv.; new *Brachyura*, id. *l. c.* pp. 540–550 & 750–757; some *Anomura* and *Macrura*, pp. 758–763.

New Zealand. Some marine Decapods, Stomapods, Amphipods, and Isopods, several new, by CHILTON & THOMSON, Tr. N. Z. Inst. xiv. pp. 171–174 & 230–238, and N. Z. J. Sci. i. p. 44. Copies of the descriptions of New Zealand *Ostracoda*, from Bates's *Ostracoda* of the 'Challenger' in the latter journal, pp. 35–39.

USE FOR MAN.

General notes upon the Copepods of the Northern seas, with some woodcuts, chiefly concerning their importance as food for Cod and other fishes; HEINCKE, "Die nutzbaren Thiere der nordischen Meere,' 1882, pp. 19–28.

Notes on the importance of *Cladocera*, *Ostracoda*, and *Copepoda*, as food of fishes, and on their feeding upon *Protozoa*; J. A. RYDER, Bull. U. S. Fish Comm. i. pp. 236–240.

Notes on the Shrimp and Prawn fisheries of the United States; R. Rathbun, Bull. U. S. Fish Comm. ii. pp. 139–152.

14 species of *Brachyura* and 5 of *Macrura* used as food in China, their fishing and Chinese names; Fauvel, Mém. Soc. Cherb. xxiii. [1881] p. 196, also pp. 132, 136 & 137.

DECAPODA.

BRACHYURA.

OXYRRHYNCHA.

INACHIDÆ.

Stenorrhynchus rostratus (L.), *egyptius* (M.-Edw.), and *longirostris* (Fabr.), British; Carrington & Lovett, Zool. 1881, pp. 199–205, with woodcuts.

Achæus cranchi (Leach), *iid. l. c.* p. 301.

Inachus dorsettensis (Penn.), *dorhynchus* (Leach), and *leptochirus* (Leach); *iid. l. c.* pp. 303–307.

Lispognathus thomsoni (Norm.), Mediterranean, and *L. furcillatus*, (A. M.-Edw.), Atlantic; A. Milne-Edwards, Rapp. faune sous-marine, pp. 16 & 39.

Amathia agassizi, sp. n., S. I. Smith, Bull. Mus. C. Z. x. p. 1, pl. ii. figs. 2 & 3, East Coast of United States, 262 and 333 fath.

Ergasticus, g. n., near *Amathia clouei*, sp. n., Toulon, 455 metres, A. Milne-Edwards, Ann. N. H. (5) ix. p. 38, and Rapp. faune sous-marine, p. 17.

MAIIDÆ.

Hyas araneus and *coarctatus* (Leach); Carrington & Lovett, *l. c.* pp. 413–415.

Hyas coarctatus (Leach), var. from the Arctic Sea; Hoek, Crust. 'Willem Barents,' p. 3, pl. i. fig. 1.

Maia squinado (Lam.); Carrington & Lovett, *l. c.* pp. 416–418.

Paramithrax spatulifer, sp. n., Haswell, P. Linn. Soc. N. S. W. vi. p. 540, Port Stephens, New South Wales. *P. coppingeri*, id. *l. c.* p. 750, Port Molle, Whitsunday Passage; both also in the author's Cat. Austral. Crust. pp. 14 & 15.

Pisa tetraodon and *gibbsi* (Leach), the latter figured in woodcut, with various sponges found attached to it; Carrington & Lovett, *l. c.* pp. 358–364.

Naxia (*Naxioides*) *robillardi*, sp. n., Miers, P. Z. S. 1882, p. 339, pl. xx. Mauritius.

Eurynome aspera (Leach); Carrington & Lovett, *l. c.* p. 418.

Periceridæ.

Tiarinia elegans, sp. n., Haswell, P. Linn. Soc. N. S. W. vi. p. 541, Broughton Islands, New South Wales; the same and *T. spinosirostris*, sp. n., Torres Straits, *id.* Cat. Austral. Crust. p. 28.

Parthenopidæ.

Heterocrypta marionis, sp. n., Toulon, 455 metres, A. Milne-Edwards, Ann. N. H. (5) ix. p. 38, and Rapp. faune sous-marine, p. 17.

Cyclometopa.

Cancridæ.

Cancer pagurus (L.), Carrington & Lovett, *l. c.* pp. 458–460.

Pirimela denticulata (Leach); *iid. op. cit.* 1882, p. 11.

Carpilodes granulosus, sp. n., Haswell, P. Linn. Soc. N. S. W. vi. p. 751, and Cat. Austral. Crust. p. 57, Torres Straits.

Liomera maculata, sp. n., *id. l. c.* p. 752, and Cat. Austral. Crust. p. 47, Endeavour River, Australia.

Leptodius granulosus, sp. n., *id.* Cat. Austral. Crust. p. 61, Port Denison, Australia.

Xantho florida (Leach), *rivulosa* (M.-Edw.), and *tuberculata* (Couch), Carrington & Lovett, *op. cit.* 1881, pp. 455–458.

Xanthodes atro-manus, sp. n., Haswell, P. Linn. Soc. N. S. W. vi. p. 542, and Cat. Austral. Crust. p. 49, pl. i. fig. 1, Australia.

Euxanthus maculatus, sp. n., *id. ll. cc.* pp. 751 & 48, Darnley Island, Torres Straits.

Cycloxanthus punctatus, sp. n., *id. ll. cc.* pp. 752 & 50, Parramatta River, Australia.

Panopæus acutidens, sp. n., *id. ll. cc.* pp. 542 & 51, pl. i. fig. 2, Port Darwin, Australia.

Eriphiidæ.

Geryon tridens (Smith), measurements of 10 specimens dredged on the East Coast of North America, 33–40° N. lat.; S. I. Smith, Bull. Mus. C. Z. x. p. 6.

Geryon quinquedens (S. Smith), found off Delaware Bay; Verrill, Am. J. Sci. (3) xxiii. p. 137.

Geryon longipes, sp. n., Bay of Biscay and Mediterranean, A. Milne-Edwards, Ann. N. H. (5) ix. p. 38, and Rapp. faune sous-marine, pp. 16 & 39.

Pilumnus hirtellus (Leach); Carrington & Lovett, Zool. 1882, pp. 9–11.

Pilumnus monilifera[*-fer*]. *inermis*, *glaberrimus*, and *integer*, spp. nn., Haswell, P. Linn. Soc. N. S. W. vi. pp. 543–545, the first Tasmanian, the others Port Jackson; *P. terræ-reginæ*, Port Molle, and *vestitus*, Port Jackson, spp. nn., *id. l. c.* pp. 752 & 753. The author in his Cat. Austral. Crust. pp. 65–70 & 325, figures *P. monilifer* and *terræ-reginæ*, pl. i. figs. 3 & 5, *fimbriatus* (M.-Edw.), and *fissifrons* (Stimps.), figs. 4 & 6.

Pilumnoides serratifrons (Kinahan, *Ozius*); Haswell, Cat. Austral. Crust. p. 70, pl. ii. fig. 1, Australia and New Zealand.

Pseuru[*e*]*ppellia*, g. n. Near *Rueppellia*, basal joint of the antennæ extremely short, not nearly reaching the front; second joint stout, reaching the front; flagellum entirely excluded from the orbit by the union of the lower orbital border with the front. *P. saxicola*, sp. n., Port Essington, used by the natives for food; Haswell, P. Linn. Soc. N. S. W. vi. p. 546, and Cat. Austral. Crust. p. 74.

Melia? brevipes, sp. n., *id. ll. cc.* pp. 545 & 72, pl. i. fig. 7, Western Port Victoria, 5 fath.

Eucrate affinis and *sexdentatus*, spp. nn., *id. ll. cc.* pp. 547, 548 & 86, off Holborn Island, Port Denison, 20 fath.

Portunidæ.

Carcinus mœnas (L.), adaptation of colour, &c.; Carrington & Lovett, Zool. 1882, pp. 12–14.

Portunus puber (Leach), *depurator* (Leach), *marmoreus* (Leach), *holsatus* (Fabr.), *corrugatus* (Leach), *pusillus* (Leach), *longipes* (Risso), *carcinoides* (Kinahan), *arcuatus* (Leach), and *tuberculatus* (Roux), all British; *iid. l. c.* pp. 98–107.

[redacted]*s tomentosus*, sp. n., Haswell, P. Linn. Soc. N. S. W. vi. p. 547, [redacted]ustral. Crust. p. 78, Port Jackson.

[redacted]*us latipes* (Penn.), Carrington & Lovett, *l. c.* p. 14.

[redacted] *henslowii* (Leach), *iid. l. c.* p. 98.

Catometopa.

Telphusidæ.

Telphusa limula, sp. n., Hilgendorf, SB. nat. Fr. 1882, p. 25, Salanga, Malacca.

Paratelphusa brevicarinata, sp. n., *id. l. c.* p. 24, Salanga.

Gecarcinidæ.

Gecarcinus ruricola (L.) and *Cardisoma guanhumi* (Latr.), both on the Islands S. Thomé and Rolas (W. Africa) in the woods near the shore, rarely higher up in the mountains; Greef, SB. Ges. Marb. 1882, pp. 26 & 27.

Cardisoma armatum (Herkl.). Note on its differences by age and sex by F. Hilgendorf, SB. nat. Fr. 1882, p. 22.

Ocypodidæ.

Ocypoda. E. J. Miers gives a revision of this genus founded on the specimens in the British Museum, with analytical table for 11 species, description of them, and figures of the most distinctive parts, chelæ, eye-stalks, &c., of some of them. *O. ceratophthalma* (Pall.) ranges from Mauritius to the Sandwich Islands; *O. cursor* (L.) from Syria to the Congo; *O. rotundata*, sp. n., Dukhum; *O. arenaria* (Catesby), from Georgia to Rio Janeiro; *O. kuhli* (De Haan), here described, from Japan, Sandwich Islands, New Hebrides, Australia, and Madagascar. Ann. N. H. (5) x. pp. 376–388, pl. xvii.

Ocypode ceratophthalma (F.) and *cordimana* (Latr.), differences of age; Lenz & Richters, Beitr. p. 3.

Ocypode hexagonura, sp. n., Hilgendorf, SB. nat. Fr. 1882, p. 23, Rufisque, near mouth of the Senegal, Liberia, and coast of Loango.

Gonoplacidæ.

Gonoplax angulata (Fabr.), Carrington & Lovett, Zool. 1882, p. 180.

Macrophthalmus grandidieri (Alph. M.-Edw.) and *polleni* (Hoffm.), described by Lenz & Richters, Beitr. pp. 3 & 4.

Macrophthalmus latifrons, sp. n., Haswell, P. Linn. Soc. N. S. W. vi. p. 549, and Cat. Austral. Crust. p. 90, Port Phillip, Victoria.

Hypophthalmus, g. n. Near *Xenophthalmus*, eyes well-developed, but placed on the underside of the cephalothorax, and the eye-stalks soldered to it. *H. leuchochirus*, sp. n., probably from China; Richters, Abh. Senck. Ges. 1882, 3 pp. pl. i. figs. 1–10.

Grapsidæ.

Plagusia squamosa (Herbst), typical specimen from the E[illegible]es, distinct from *depressa* (Fabr.), from both sides of the Atlantic; Hilgendorf, *l. c.* p. 24.

Planes linnæana (Leach) sometimes found on the Cornish and Devon Coast, Carrington & Lovett, *l. c.* pp. 181 & 182. 7 specimens taken at Penzance among seaweed growing on a derelict cask picked up at sea; T. Cornish, *tom. cit.* p. 118.

Brachynotus (De Haan, 1835) = *Heterograpsus* (Lucas, 1849), *B. sexdentatus* (Risso, 1826, *Gonoplax*) = *H. sexdentatus* (Lucas) = *lucasi* (M.-Edw., 1853), Mediterranean, and *B. edwardsi*, new name for *H. sexdentatus* (M.-Edw., *nec* Lucas); Hilgendorf, SB. nat. Fr. 1882, pp. 68–70.

Utica setosipes and *crassimana*, spp. nn., Haswell, P. Linn. Soc. N. S. W. vi. p. 549, and Cat. Austral. Crust. pp. 101 & 102, pl. ii. figs. 2 & 3, Port Denison, on the seashore.

Chasmognathus convexus, sp. n., Haswell, *ll. cc.* pp. 550 & 106, Shoalhaven, Australia.

Pinnoteridæ.

Pinnoteres pisum (Latr.) and *veterum* (Bosc.), Carrington & Lovett, *l. c.* pp. 178 & 179. The latter also found in Ascidians; Giesbrecht, MT. z. Stat. Neap. iii. p. 295.

Pinnoteres ostreæ (Say), zœa-stage; Birge, Am. Nat. xvi. pp. 589–591, woodcut.

Pinnixa chætopterana (Stimps.) in the tube of *Chætopterus*, Vineyard Sound, Mass.; Verrill, Am. J. Sci. (3) xxiv. p. 371.

Hymenosoma rostratum, sp. n., Haswell, P. Linn. Soc. N. S. W. vi. p. 550, Port Western, Victoria; *H. australe*, sp. n., *id. l. c.* p. 754, Port Phillip. Both also in his Cat. Austral. Crust. pp. 115 & 116, the first pl. iii. fig. 2.

Hymenicus marmoratus, sp. n., Chilton, Tr. N. Z. Inst. xiv. p. 172, maxillipeds and abdomen, pl. viii. figs. 1 *a–c*, New Zealand.

Elamena ? *lacustris*, sp. n., *id. l. c.* p. 172, Lake Pupuke, fresh-water, North Shore, Auckland, New Zealand.

Oxystoma.

Corystidæ.

Corystes cassivelaunus (Leach), Carrington & Lovett, Zool. 1882, p. 229.

Atelecyclus septem-dentatus (Leach), *iid. l. c.* p. 185.

Thia polita (Leach), *iid. l. c.* p. 228.

Calappidæ.

Orithyia mammillaris (Hbst.). Note by E. Lucas, Ann. Soc. Ent. Fr. (6) ii. p. cxxxi.

Leucosiidæ.

Phlyxia petleyi, sp. n., Haswell, P. Linn. Soc. N. S. W. vi. p. 754, and Cat. Austral. Crust. p. 125, pl. iii. fig. 3, Port Molle, Australia.

Ebalia tumificata (Mont.), *cranchi* (Leach), and *tuberosa* (Pennant), Carrington & Lovett, *l. c.* pp. 182–184.

Dorippidæ.

L. Joliet states from observation that the dorsal feet of *Ethusa* serve for the same purpose as in *Dromia* (see Dromiidæ); Arch. Z. expér. x. pp. 111–117.

Cyphyra octo-dentata, sp. n., Haswell, P. Linn. Soc. N. S. W. vi. p. 753, and Cat. Austral. Crust. p. 82, Palm Island, East Coast of Queensland.

ANOMURA.

Dromiidæ.

L. Joliet has observed that the dorsal feet in *Dromia* are actually employed for seizing foreign bodies, and bearing them on the back for protection and concealment, as supposed by former authors; Arch. Z. expér. x. pp. 111–117.

Dromia australiensis, *octo-dentata*, *sculpta*, and *conchifera*, spp. nn., the last protecting itself with the valve of a Lamellibranch, which it holds tightly over its back by means of its unusually powerful fourth pair of legs, all from Australia; Haswell, P. Linn. Soc. N. S. W. vi. pp. 755–758, and Cat. Austral. Crust. pp. 139–142.

Lithodidæ.

Lithodes agassizi, sp. n., S. I. Smith, Bull. Mus. C. Z. x. p. 8, pl. i., East Coast of the United States, 410–810 fath.

Hippidæ.

Apparent bird-tracks on the sea-shore made by *Hippa talpoidea* (Say); T. Meehan, P. Ac. Philad. 1882, p. 238.

Paguridæ.

Pagurus bernhardus (L.), *prideauxi* (Leach), *cuanensis* (Thomps.), *pubescens* (Krŏyer) = *thompsoni* (Bell), *ulidianus* (Thomps.), *hyndemanni* (Thomps.), and *lævis* (Thomps.), British; Carrington & Lovett, Zool. 1882, pp. 386–391.

Eupagurus politus, sp. n., S. I. Smith, *l. c.* p. 12, pl. ii. fig. 5, East Coast of the United States, 38–41° N. lat., 197–304 fath.

Eupagurus jacobi (Al. Ag.) = *Parapagurus pilosimanus* (S. Smith), Atlantic; A. Milne-Edwards, Rapp. faune sous-marine, p. 40.

Catapagurus (A. M.-Edw., Dec. 1880, = *Hemipagurus*) *socialis*, and *gracilis* (S. I. Smith, 1881), East Coast of the United States, 32–40° N. lat., fully described; S. I. Smith, *l. c.* pp. 14–20.

Calcinus terræ-reginæ, sp. n., Haswell, P. Linn. Soc. N. S. W. vi. p. 760, and Cat. Austral. Crust. p. 158, Queensland.

Calcinus nitidus (Heller), var. from Madagascar; Lenz & Richters, Beitr. p. 6.

Cœnobita rugosus (M.-Edw.), in the Island St. Thomé, common near

the shore, but also higher up in coffee plantations, 800 metres above the sea; lodges in various shells, even in those of *Echini*, and feeds principally on cocoa-nuts. Greeff, SB. Ges. Marb. 1882, pp. 28 & 29.

Birgus latro (L.). H. B. Guppy confirms the fact that this crab is in the habit of breaking open the shells of cocoa-nuts with its powerful chelæ; P. Linn. Soc. N. S. W., Dec. 1882. Its stomachal armature described by Boas; v. *supra*, General Subject.

Porcellanidæ.

Porcellana pulchella, nitida, vigintispinosa, corallicola, and *transversa*, spp. nn., Haswell, P. Linn. Soc. N. S. W. vi. pp. 758 & 759, and Cat. Austral. Crust. pp. 148–150, Australia.

Petrolisthes inermis, sp. n., *id. ll. cc.* pp. 757 & 146, Port Denison, Australia.

MACRURA.

Galateidæ.

Galatea corallicola, magnifica, aculeata, and *deflexifrons*, spp. nn., Haswell, P. Linn. Soc. N. S. W. vi. p. 761, and Cat. Austral. Crust. pp. 162 & 163, Australia.

Galateodes marionis, sp. n., A. Milne-Edwards, Ann. N. H. (5) ix. p. 39, and Rapp. faune sous-marine, p. 17, Planier, South Coast of France, about 455 metres; *G. acutus* and *rosaceus*, spp. nn., Bay of Biscay, 1950 and 900 metres, A. Milne-Edwards, Rapp. faune sous-marine, p. 40.

Munida, sp. n. ?, Hoek, Crust. 'Willem Barents,' p. 8, pl. i. fig. 2, Arctic Sea.

Munidopsis curvirostra (Whiteaves) and *Munida*, sp. ? from the East Coast of the United States, figured by S. I. Smith, Bull. Mus. C. Z. x. pp. 21 & 22, pl. viii. figs. 2 & 3, and pl. x. fig. 1.

Elasmonotus vaillanti, sp. n., A. Milne-Edwards, Rapp. faune sous-marine, p. 40, Atlantic, 1068 metres.

Diptychus rubro-vittatus, sp. n., *id. l. c.* p. 41, Atlantic, 900 metres, on *Lophohelia*.

Palinuridæ.

[illegible]rus longimanus (M.-E.) var. n. *mauritianus*, Miers, P. Z. S. 1882, [illegible]42, pl. xxxvi. fig. 1, Mauritius, fully described.

[illegible]rellus (Martens, 1878). The identity of *Aræosternus* (De Man, [illegible]h this genus is acknowledged by De Man, Not. Leyd. Mus. ii. p[illegible] 162, and of *Synaxes* (Spence Bate, 1881) with it by Boas, Zool. An[illegible]882, pp. 111–114; the latter observes that it approaches *Homarus*, but has no direct relations to the *Scyllaridæ*. T. C. Winkler, after recapitulating at length what is known about the fossil genera *Pemphix* and *Glyphea*, comes to the conclusion that they form a continuous series of forms from the Trias to the Quaternary period, culminating in the Oxfordian strata, and that *Aræosternus* is the last and only living representative of them; Ann. N. H. (5) x. pp. 133–149 & 306–317.

Scyllaridæ.

Pseudibacus pfefferi, sp. n., Miers, P. Z. S. 1882, p. 542, pl. xxxvi. figs. 2 & 3, Mauritius.

Eryonidæ.

Pentacheles sculptus (S. I. Smith, Apr., 1880, as *Polycheles*) = *Pentacheles spinosus* (A. M.-Edwards, Dec., 1880), East Coast of United States, 33–34° N. lat., 464–647 fath., fully described by S. I. Smith, Bull. Mus. C. Z. x. pp. 23–31, pls. iii. & iv.; 60–126 mm. long, epipods in ninth, tenth, eleventh, twelfth, and thirteenth somites, podobranchiæ in the tenth, eleventh, twelfth, and thirteenth; two arthrobranchiæ in the same; pleurobranchiæ in the eleventh, twelfth, thirteenth, and fourteenth somites.

Willemoesia sp., perhaps *leptodactyla*, found at a depth of about 2800 metres in the Mediterranean, near the Island Asinara; E. H. Giglioli, Ann. Sci. Nat. (6) xiii. art. 9, pp. 5–7.

Eryoneicus, g. n. Carapace dorsally arched, hemispherical, approximately as long as broad; no eyes; second pair of antennæ scarcely longer than the first, carrying a small scaphocerite and a long cylindrical phymacerite; first, second, and third pairs of periopods chelate, the first longest; fourth imperfectly chelate, fifth terminating in a simple dactylus. *E. cæcus*, sp. n., half an inch long, Canary Islands, 1675 fath. C. Spence Bate, Ann. N. H. (5) x. pp. 456–458.

Astacidæ.

Astacus. C. B. Klunzinger distinguishes 3 species living in Middle Europe, viz., (1) *fluviatilis* (L.) [Fabr.], generally distributed; (2) *torrentium* (Schrank), = *saxatilis* and *tristis* (Koch), = *longicornis* (Lereboullet), Southern Bavaria, Württemberg, Alsace, in rapidly running streams and sub-alpine lakes on gravelly ground, and (3) *pallipes* (Lereboullet), = *saxatilis* (Heller & Gerstfeldt, *nec* Koch), = ? *fontinalis* (Carbonnier), Alsace, Neufchatel, Trieste, and Dalmatia, on muddy ground, and points out their specific differences; JH. Ver. Württ. 1882, pp. 326–342.

Rubelius's paper on craw-fish culture, first published in German in the "Industrie-Blätter," 1880, No. 31, is translated into English in Rep. U. S. Comm. of Fish and Fisheries, vii., for 1879 (publish[illegible]82), pp. 767–770.

Cambarus, notes on several species found in Illinois by A. Fo[illegible] Illin. Mus. i. 1876, pp. 3–5, 18 & 19. *C. sloanii*, Southern Indi[illegible] tucky, and *C. debilis*, Wisconsin River, spp. nn., Bundy, *l. c.* pp[illegible]5. 11 species observed and their differences discussed by Bun[illegible]r. Wiscons. Ac. v. p. 179.

Cambarus stygius, sp. n., Joseph, B. E. Z. xxvii. p. 12, Cave of St. Kanzian, Carniolia. Number of gills not stated; eye-ball distinct, but without cornea and refracting parts.

Oreonectes hamulatus, sp. n., Cope, Am. Nat. xv. [1881] p. 881, pl. vii. fig. 1, Nickajack Cave, Tennessee.

Homarus vulgaris (M.-E.). Notes on the growth of the cephalothorax in the lobster; T. Tullberg, *suprà*, General Subject (generation and development). On the distortions of the claws; Hyatt, P. Bost. Soc. xxi. p. 278.

Paranephrops setosus, notes on its differences from *Astacus fluviatilis*; Chilton, N. Z. J. Sci. i. p. 232.

Thalassinidæ.

Callianassa madagassa, sp. n., Lenz & Richters, Beitr. p. 7, pl. 1, figs. 20–23, Madagascar.

Callianassa mauritiana, sp. n., Miers, P. Z. S. 1882, p. 341, Mauritius.

Gebia spinifrons, sp. n., Haswell, P. Linn Soc. N. S. W. vi. p. 762, and Cat. Austral. Crust. p. 165, pl. iii. fig. 5, Port Stephens, N. S. Wales, 8 fath.

Crangonidæ.

Cheraphilus ferox (G. O. Sars); Hoek, Crust. 'Willem Barents,' p. 9, pl. i. fig. 3, Arctic Sea.

Cheraphilus neglectus, sp. n., G. O. Sars, Forh. Selsk. Chr. 1882, p. 45, pl. i. fig. 7, Norway.

Ceraphilus agassizi, sp. n., S. I. Smith, Bull. Mus. C. Z. x. p. 32, pl. vii. figs. 4 & 5, East Coast of United States, 31–35° N. lat., 263–603 fath.

Sclerocrangon, g. n., proposed for *Crangon boreas* (Phipps); Sars, *l. c.* p. 45.

Pontophilus brevirostris (S. I. Smith, 1881), and *gracilis*, sp. n., the latter East Coast of United States, 32° N. lat., 225 fath., both figured; *id. l. c.* pp. 35 & 36, pl. vii. figs. 1–3.

Pontophilus jacqueti, sp. n., A. Milne-Edwards, Rapp. faune sous-marine, p. 41, Atlantic.

Sabinea princeps, sp. n., *id. l. c.* p. 38, pl. viii. fig. 1, East Coast of United States, 33–39° N. lat., 372–740 fath., 56–98 mm.

Rhachocaris, g. n. Anterior thoracic legs stout, non-chelate; second pair slender, chelate, and with multiarticulate carpi; coxæ of the external maxillipeds articulated with the adjacent edge of the carapax; antennal scales broad, ovate, ciliate on both margins. Epipods in the seventh and eighth somite, no podobranchiæ, arthrobranchiæ two in the ninth, one in the tenth, eleventh, twelfth and thirteenth, pleurobranchiæ in the tenth, eleventh, twelfth, thirteenth, and fourteenth somites. *R. agassizi*, *sculpta*, and *longirostris*, spp. nn., 54–111 mm., East Coast of United States, 31–38° N. lat., 464–1186 fath.; S. I. Smith, *l. c.* pp. 41–53, pls. v. figs. 1–3, and vi. figs. 1–3.

Atyidæ.

Atya scabra (Leach), variations and occurrence in the rivers of the Island S. Thomé, W. Africa; Greeff, SB. Ges. Marb. 1882, pp. 35–37.

Miersia agassizi and *gracilis*, spp. nn., East Coast of United States, 31–41° N. lat., 457–1632 fath. Branchial formula nearly the same as in

Pandalus, but no epipod on the thirteenth somite; the latter species possibly identical with *Acanthephyra debilis* (A. M.-Edw.). *Miersia* Kingsley (*Ephyra*, Roux) and the two following have perhaps more affinity to *Hoplophorus* and *Pandalus* than *Atya*. S. I. Smith, *l. c.* pp. 66–73, pls. xi. figs. 4–7, and xii. figs. 1–4.

Meningodora, g. n. Integument throughout very thin and membranaceous; body compressed laterally, and the carapax dorsally carinate anteriorly, with a short triangular rostrum, a branchiostegal spine and an antennal and hepatic sulcus, above which there is a carina which is continued back along the dorsal limit of the branchial region, recalling the *Penæidæ*; antennal scales broad and foliaceous, all the other articular appendages essentially as in *Miersia*; the branchiæ are also of the same structure and arrangement as in *Miersia*, except that there is but one arthrobranchia at the base of the external maxilliped. *M. mollis*, sp. n., 75 mm., East Coast of United States, 34° N. lat., 1632 fath. S. I. Smith, *l. c.* pp. 73–76, pls. xi. figs. 8 & 9, xii. figs. 5–9.

Eumiersia, g. n. External form of carapax and abdomen, oral appendages, branchiæ, and epipods, as in *Pandalus*: structure of the thoracic legs more like those of *Miersia*, but much elongated; epipods very small on the fourth pair, none on the fifth; mandibles essentially as in *Pandalus*, but stouter, with larger molar and very thin expanded ventral processes. *E. ensifera*, sp. n., 125 mm., East Coast of United States, 31–41° N. lat., 810–1394 fath. S. I. Smith, *l. c.* pp. 77–81, pl. xiii. figs. 1–9.

Paratya, g. n., for *Ephyra? compressa* (Haan) = *Atyephyra compressa* (Von Martens), Japan, fresh-water, because all the thoracic limbs (not only the four anterior) are provided with palpiform appendages. The described specimens appear to vary somewhat in the number of teeth on the rostrum. E. J. Miers, Ann. N. H. (5) ix. pp. 193–195.

Palæmonidæ (incl. Alpheidæ.)

Alpheus, metamorphosis; W. Brooks in J. Hopkins Univers. Circul. No. 17, p. 247.

Alpheus comatularum, sp. n., Haswell, P. Linn. Soc. N. S. W. vi. p. 762, and Cat. Austral. Crust. p. 189, Queensland, invariably found clinging to the arms of *Comatula*, to which its markings give it a general resemblance.

Pandalus brevirostris (Rathke); Hoek, Crust. 'Willem Barents,' p. 22, pl. i. fig. 10, Arctic Sea.

Pandalus leptocerus and *tenuipes* (S. I. Smith, 1881), *acanthonotus* and *carinatus*, spp. nn., East Coast of United States, the last species, distinguished by a keeled cephalothorax, falls evidently in *Heterocarpus* (Milne-Edwards, 1881), the affinities of which have been misapprehended by its author. S. I. Smith, Bull. Mus. C. Z. x. pp. 58–66, the second and third figured pl. xiii. figs. 11 & 12, the last pls. x. fig. 2, and xi. figs. 1–3.

Heterocarpus (A. M.-Edw., 1881), see *Pandalus*.

Pontonia diazonæ, sp. n., Joliet, Arch. Z. expér. x. pp. 118–120, Mediterranean, ordinarily on *Diazona violacea*; the shrimp has exactly the same pale rose colour as the Ascidian, and is therefore hardly visible.

Pontonia flavo-maculata (Heller) found living in Ascidians; Giesbrecht, MT. z. Stat. Neap. iii. p. 295.

Hippolyte spinus (Sow.) = *sowerbii* (Leach), Arctic Sea; Hoek, Crust. 'Willem Barents,' p. 15, pl. i. fig. 4.

Bythocaris payeri (Heller), *id. l. c.* p. 19, pl. i. figs. 8 & 9, Arctic Sea.

Richardina, g. n., cervical furrow girt with short spines; blind. *R. spinicincta*, sp. n., Atlantic, A. Milne-Edwards, Rapp. faune sous-marine, p. 41.

Anchistia tenella, sp. n., S. I. Smith, Bull. Mus. C. Z. x. p. 55, pl. ix. fig. 1, East Coast of United States, 32° N. lat., 229 fath.

Palæmon olfersi (Wiegm.) = *spinimanus* (M.-Edw.), variations and sexual differences, the fingers of the second pair of periopods hooked in the male, joined in a straight line in the female; common in rivers of the Island of St. Thomé, W. Africa; Greeff, SB. Ges. Marb. 1882, pp. 30–35.

Palæmon. Critical notes concerning the distinction of the species *P. mayottensis*, *reunionensis*, and *longimanus* (Hoffm.), united into one species, by Lenz & Richters, Beitr. pp. 7 & 8.

Palæmonetes varians (Leach), description and varieties by A. Garbini, Bull. Soc. Ven. Trent. ii. pp. 102–109, and Bull. Soc. Ent. Ital. 1882, p. 389; its nervous system by the same, Atti Soc. Ven. Trent. vii. pp. 179–199.

Chlorotocus, g. n., A. Milne-Edwards, Rapp. faune sous-marine, p. 18, Coast of Morocco, 322 metres.

Acanthephyra purpurea, sp. n., *id. l. c.* p. 41, Atlantic, 2590 metres.

Penæidæ.

Penæus: on its metamorphosis; Brooks, Hopkins University Circular, No. 19, p. 6.

Penæus siphonocerus (Otto), found in the Adriatic; Stossich, Bull. Soc. Adr. vii.

Sicyonia, 2 species without name from Australia; Haswell, Cat. Austral. Crust. pp. 204 & 205.

Benthesicymus? bartletti, sp. n., S. I. Smith, Bull. Mus. C. Z. x. pp. 81–86, pl. xiv., East Coast of United States, 39° N. lat., 732 fath., from a single mutilated specimen, branchial formula differing from that given by C. Spence Bate.

Amalopenæus, g. n. The whole integument membranaceous, very soft and thin; carapax, eyes, antennulæ, antennæ, mandibles, and maxillæ nearly as in *Benthesicymus*: merus of the second maxilliped expanded along the inside into a thin lamelliform plate, which conceals the three distal segments when they are flexed; first three pairs of thoracic legs nearly equal, but ischium and merus of the first compressed and expanded; no ectopod at the base of any of the thoracic legs. *A. elegans*, sp. n., East Coast of the United States, 31–39° N. lat., 372–1632 fath. S. I. Smith, *l. c.* pp. 86–91, pls. xiv. figs. 8–14, and xv. figs. 1–5.

Hymenopenæus, g. n. The whole integument membranaceous, exceedingly thin and soft; carapax slightly compressed, not conspicuously keeled on the posterior part, with four large and acute lateral spines on

either side; mandibular palpus with small and narrow terminal segment; endognath of the first maxilla short and unsegmented; very minute setiferous pods on the external maxillipeds, and on all the thoracic legs, a podobranchia only on the eighth somite, two arthrobranchiæ on the eighth, ninth, tenth, eleventh, twelfth, thirteenth, and fourteenth somites, one pleurobranchia on the same, except the eighth. *H. debilis*, sp. n., 42 mm., East Coast of the United States, 31-32° N. lat., 333-464 fath. S. I. Smith, *l. c.* pp. 91-95, pls. xv. figs. 6-11, xvi. figs. 1-3.

Sergestidæ.

Sergestes robustus, sp. n., East Coast of the United States, 34-39° N. lat., 372-1632 fath., and *S. arcticus* (Kröyer), S. I. Smith, *l. c.* pp. 96-100, pl. xvi. figs. 4-8.

SCHIZOPODA.

Heteromysis norvegica, sp. n., G. O. Sars, Forh. Selsk. Chr. 1882, p. 54, Norway. *Chiromysis* (G. O. Sars) is identified with *Heteromysis*; id. *l. c.* p. 55.

Thysanopoda bidentata, sp. n., *id. l. c.* p. 50, pl. i. figs. 11-14, Norway.

Thysanoessa borealis and *tenera*, spp. nn., *id. l. c.* pp. 52 & 53, pl. i. figs. 16-20, Northern Norway.

STOMATOPODA.

List of the species of *Squillidæ* in the Brussels Museum; A. Preudhomme de Borre, C. R. Ent. Belg. (3) pp. cxi. & cxii.

Squilla tridentata, sp. n., Thomson, Tr. N. Z. Inst. xiv. New Zealand.

Lysiosquilla miersi, sp. n., De Vis, P. Linn. Soc. N. S. W. vii. p. 321, Moreton Bay.

CUMACEA.

Hemilamprops assimilis, sp. n., G. O. Sars, Forh. Selsk. Chr. 1882, p. 55, pl. i. figs. 23 & 24.

PHYLLOCARIDA.

Nebalia bipes (O. Fabr.), dredged on the coast of Labrador, externally, anatomically, and embryologically described by A. S. Packard, Jr., who comes to the conclusion that *Nebalia* forms a separate Order among the *Crustacea*, which may be termed *Phyllocarida* [cf. Zool. Rec. xvi. *Crust.* p. 26], and is distinct from the *Decapoda* by (1) the loosely attached carapace, the two halves of which are connected by an adductor muscle; (2) the movable rostrum; (3) the very long and large mandibular palpus, the long slender appendage of the first maxillæ, and the very long biramous maxillæ; (4) the absence of any maxillipeds; (5) the eight pairs of

pseudo-phyllopod thoracic feet, not adapted for walking; and (6) no zoea-formed larva: from the Phyllopods, by (1) the carapace not being hinged, but provided with a rostrum; (2) two pairs of well-developed long and large multi-articulate antennæ; (3) the thorax and its appendages being clearly differentiated from the abdomen, and having internally no functional gland; also in having no highly developed liver tubes, and a stomach and cæcal appendages entirely unlike those of Phyllopods. He refers to this Order also the palæozoic *Hymenocaris*, *Peltocaris*, *Ceratiocaris*, *Dictyocaris*, *Dithyrocaris*, and *Argus*, and considers that it became well established in the lowest Primordial period, culminated in the upper Silurian, and became nearly extinct at the close of the Carboniferous. Am. Nat. xvi. pp. 861–873, pls. xiii.–xv. & 945–953, with woodcuts.

AMPHIPODA.

Orchestiidæ.

Neobule (Haswell) belongs to this family; Haswell, Cat. Austral. Crust. p. 324.

Gammaridæ.

Lysianassa nitens and *affinis* (Haswell, 1879); *id. l. c.* p. 232, pl. iv figs. 1 & 2, Port Jackson.

Lysianella petalocera, g. & sp. nn., G. O. Sars, Forh. Selsk. Chr. 1882, p. 78, pl. iii. fig. 3, Lyngdals Fjord, Norway.

Ichnopus umbonatus, sp. n., *id. l. c.* p. 79, pl. iii. fig. 2, Norway.

Socarnes ovalis, sp. n., Hoek, Crust. 'Willem Barents,' p. 42, pl. iii. fig. 29, Arctic Sea.

Aonyx debruyni, sp. n., *id. l. c.* p. 44, pl. iii. fig. 30, Arctic Sea.

Aonyx corpulentus, sp. n., Thomson, Tr. N. Z. Inst. xiv. New Zealand.

Glycerina, new name for *Glycera* (Haswell, 1879, pre-occupied) *tenuicornis* (Haswell); Haswell, *l. c.* pp. 233 & 234, pl. iv. fig. 3, Port Jackson.

Neobule, see *Orchestiidæ*.

Orchomene pectinata and *batii*, spp. nn., Sars, *l. c.* pp. 80 & 81, the former pl. iii. fig. 5, Norway.

Tryphosa ciliata, sp. n., *id. l. c.* p. 81, pl. iii. fig. 4, Norway.

Normania latimana, sp. n., *id. l. c.* p. 83, pl. iii. fig. 6, Norway.

Stegocephalus gibbosus and *auratus*, spp. nn., *id. l. c.* pp. 85 & 86, pl. iii. figs. 7 & 8, Norway.

Andania pectinata, sp. n., *id. l. c.* p. 86, pl. iii. fig. 9, Varanger Fjord.

Amphilochus inermis, sp. n., *id. l. c.* p. 87, pl. iii. fig. 10, Varanger Fjord.

Stegoplax longirostris, g. & sp. nn., *id. l. c.* p. 88, pl. iii. fig. 11, Lofoten Islands.

Phoxus falcatus, sp. n, *id. l. c.* p. 84, Norway.

Stenothoe tenella and *brevicornis*, spp. nn., *id. l. c.* pp. 88 & 89, pls. iii. fig. 12, & iv. fig. 1, Norway.

Metopa rubro-vittata, *leptocarpa*, *borealis*, *calcarata*, and *gregaria*, spp. nn., *id. l. c.* pp. 90–93, pl. iv. figs. 2–6, Norway.

Bruzelia tuberculata, sp. n., Sars, *l. c.* p. 95, pl. iv. fig. 7, Norway.

Leucothoe spinicarpa (Hell.), found between the tunica and gill-sac in *Phallusia*; Giesbrecht, MT. z. Stat. Neap. iii. p. 295.

Leucothoe traili, sp. n., Thomson, Tr. N. Z. Inst. xiv. New Zealand.

Tritropis inflata and *avirostris*, spp. nn., Sars, *l. c.* p. 105, pl. v. figs. 7 & 8, Norway.

Œdiceras microps, sp. n., *id. l. c.* p. 95, pl. iv. fig. 8, Finmark.

Halimedon megalops, sp. n., *id. l. c.* p. 96, pl. iv. fig. 9, Finmark.

Halicrion ? laticeps, sp. n., *id. l. c.* p. 97, pl. iv. fig. 10, Varanger Fjord.

Paramphithoe brevicornis and *assimilis*, spp. nn., *id. l. c.* pp. 98 & 99, pls. iv. fig. 11, and v. fig. 12, Norway.

Iphimedia minuta, sp. n., *id. l. c.* p. 100, pl. v. fig. 3, Norway.

Atylus uncinatus, sp. n., *id. l. c.* p. 102, pl. v. fig. 3, Norway.

Halirages megalops and *inermis*, spp. nn., *id. l. c.* pp. 102 & 103, pl. v. figs. 4 & 5, Norway.

Calliope subterranea, sp. n., Chilton, Tr. N. Z. Inst. xiv. p. 177, pl. ix. figs. 1–10. From a pump at Eyreton, New Zealand. Eyes absent; peculiar sensory capsules on both antennæ of the male.

Amphithopsis nodifera, sp. n., Sars, *l. c.* p. 103, pl. v. fig. 6, Norway.

Gammarus fragilis, sp. n., *id. l. c.* p. 179, pl. ix. figs. 11–18. No eyes. From a pump at Eyreton, New Zealand. Described from a female; Chilton, N. Z. J. Sci. i. p. 44.

Melita pellucida, sp. n., Sars, *l. c.* p. 106, pl. v. fig. 9, Norway.

Niphargus orcinus, sp. n., Joseph, B. E. Z. xxvii. p. 7, Caves of Potis Kawez and Mrzla jama, Carniolia, 51 mm. long, without eyes.

Crangonyx mucronatus, sp. n., A. Forbes, Bull. Illin. Mus. i. [1876], p. 6, Illinois. *C. antennatus*, sp. n., Nickajack Cave, Tennessee; Packard, Am. Nat. xv. [1881] p. 880, pl. vii. fig. 2. See also Hay, Am. Nat. xvi. pp. 143–146. *C. lucifugus* and *bifurcus*, spp. nn., Hay, *l. c.* pp. 144 & 145, Illinois.

Crangonyx compactus, sp. n., Chilton, Tr. N. Z. Inst. xiv. p. 177, pl. x. figs. 13–19. From a pump at Eyreton, New Zealand. Eyes not visible.

Mœra petrici, sp. n., Thomson, *tom. cit.* New Zealand.

Ampelisca gibba and *anomala*, spp. nn., Sars, *l. c.* pp. 107 & 108, pl. vi. figs. 1 & 2, Norway.

Haplops lævis, sp. n., Hoek, *l. c.* p. 61, pl. iii. fig. 31, Arctic Sea.

Byblis erythrops, sp. n., Sars, *l. c.* p. 109, pl. vi. fig. 3, Norway.

Photis tenuis, sp. n., *id. l. c.* p. 110, pl. vi. fig. 4, Varanger Fjord.

Microdeutopus maculatus (Thomps.), (supposed) male described by Chilton, Tr. N. Z. Inst. xiv. p. 173, gnathopods, pl. viii. fig. 3, New Zealand.

Gammaropsis melanops, sp. n., Sars, *l. c.* p. 111, pl. vi. fig. 5, Norway.

Polycheria obtusa, sp. n., Thomson, *tom. cit.*, New Zealand.

Corophiidæ.

Podocerus tuberculatus, sp. n., Hoek, *l. c.* p. 64, pl. iii. fig. 32, Arctic Sea.

Podocerus minutus, sp. n., Sars, Forh. Selsk. Chr. 1882, p. 112, pl. vi. fig. 6, Norway.

Icilius australis and *punctatus* (Haswell, 1879) are varieties of one species; Haswell, Cat. Austral. Crust. p. 275, pl. iv. fig. 4, Port Jackson.

Siphonœcetes pallidus, sp. n., Sars, *l. c.* p. 113, pl. vi. fig. 7, Norway, in *Dentalium*.

Iphigenia [name twice pre-occupied in *Mollusca*], g. n., like the preceding, even more Isopod-like; for *I. typica*, Thomson, Tr. N. Z. Inst. xiv. and N. Z. J. Sci. i. p. 44, New Zealand.

Hyperiidæ.

Clydonia borealis, sp. n., Sars, Forh. Selsk. Chr. 1882, p. 76, pl. iii. fig. 2, Lofoten Islands.

Phronimatidæ.

General sketch of the family and special description of *Phronima atlantica* (Guérin), *pacifica* (Streets, 1877), and *Phronimella elongata* (Claus), all collected in the Pacific between 30° S. and 40° N. lat., and 81–160° W. long., by Streets, P. U. S. Nat. Mus. v. pp. 3–9, pl. i. figs. 1–5.

Caprellidæ.

Historical sketch and lengthy recapitulation of nearly all hitherto published concerning this family, with some new species and many woodcuts, by P. Mayer, Caprelliden, pp. 1–83; table of known genera, pp. 17 & 18; alphabetical list of all names of species, pp. 78–83; geographical distribution, some species cosmopolitan, pp. 84–90; general anatomy and histological description, pp. 91–164; development, pp. 165–168; biological observations, containing notes on mimicry, chromatophores, parasites, &c., pp. 179–184; theoretical ideas on their phylogeny, which is derived from the *Gammaridæ*, pp. 185–193; bibliography, pp. 194–201.

Caprellina longicornis (Nicolet), Mayer, *l. c.* p. 27, woodcut, New Zealand and Chili.

Protella phasma (Montagu), including *dana* and *subspinosa* (Kossmann), *longispina* (Krøyer), and *major* (Haller); *id. l. c.* p. 29, pls. i. fig. 2, iii. & iv., Mediterranean.

haswelliana, sp. n., *id. l. c.* p. 32, woodcut, Australia.

(Lam.). On the variability of specific characters, only old males table of sure determination; analytical table of 10 species; *C.* a (Leach), including *acuminifera* (Desm.), *antennata* and *elon-* aller), *armata* and *aspera* (Heller), *calva* (Bate), *fabris* (Nardo), *ox* (Tschernjafski), Naples; *C. grandimana*, sp. n., Naples, *C. aquilibra* (Say) = *januarii* (Krøyer) = *esmarki*, and *laticornis* (Boeck) = *obesa* (Haswell), Mediterranean, British Seas, Norway, South Carolina, Rio Janeiro, New South Wales, and Hong Kong; *C. acutifrons* (Latr.) = *cornalia* (Nardo) = *dilatata* (Dana) = *geometrica* (Say) = *pennanti* (Leach), &c., Mediterranean, British Seas, North America, Rio Janeiro, Hong Kong;

C. dentata (Heller), Naples ; *C. linearis* (L.), Northern Seas; *C. attenuata* (Dana), Rio Janeiro and Port Jackson : described and figured from speci- mens, and critical notes concerning other species, by Mayer, *l. c.* pp. 36–72, pl. i. figs. 5–8, comparative sketches of the whole animals, pls. ii. & iii. figs. 1–15, iv. figs. 20–25, v. figs. 15–18 & 22–30, particular parts of them, and several woodcuts.

Caprella ciliata, sp. n., Sars, Forh. Selsk. Chr. 1882, p. 114, pl vi. fig. 9, Norway.

Podalirius kræyeri (Haller), Naples, on muddy ground, the four hinder feet stemmed on the ground, and *P. minutus*, sp. n., Naples; Mayer, *l. c.* pp. 73 & 77, pls. i. figs. 3 & 4, iii. figs. 30–36, iv. figs. 9–19, v. figs. 11–14.

ISOPODA.

A. Gerstäcker, in Bronn's "Klassen und Ordnungen des Thierreichs," v., *Arthropoda*, ii., continues his valuable comprehensive description of the whole organization of the *Isopoda*, pp. 97–112, passing to their development, pp. 112–165, and biological relations, including the changes of colour observed in some of them by Mayer and others, p. 169; their occurrence on land and in fresh-water, pp. 170–173; and parasitic life, with list of all known parasitic species, and indications of their host, pp. 179–186 ; finally a critical review of the classifications proposed by various authors, pp. 186–197. He himself arranges this Order as follows, p. 198 :—

Section 1. *Isopoda anomala.* Only family, *Anceidæ*.

Section 2. *Isopoda genuina.* Family 1. *Oniscoidea* ; 2. *Serolidea* ; 3. *Asellina* ; 4. *Munnopsidæ* ; 5. *Idotheidea*, including *Arcturus* ; 6, *Anthuridæ* ; 7. *Sphæromidæ* ; 8. *Ægidæ* ; 9. *Cymothoidæ* ; 10. *Bopyridæ* ; 11, *Cryptoniscidæ*.

Full characters of all these families, pp. 199–203, of all known genera, pp. 203–239. The plates ix.–xxii. contain figures of the chief representatives and their structural peculiarities.

30 fossil forms of *Isopoda* are enumerated by L. v. Ammon, SB. bayer. Ak. 1882, p. 507, pls. i.–iv.

Tanaidæ (incl. Apseudidæ).

G. O. Sars publishes a revision of the cheliferous *Isopoda*, c[illegible]g the families *Apseudidæ* and *Tanaidæ*, enumerating all known g[illegible] species, and describing several new ; he thinks that F. Müller is attributing two distinct forms of males to the same species. Ar[illegible] Naturv. vii. i. pp. 1–54.

Leptochelia savignii (Kröyer), ♀, = *Tanais edwardsi* (Kröyer), [illegible] Madeira, Southern Coast of England, North America, Mediterranean, *dubia* (Kröyer) = ? *algicola* (Harger), Brazil, North America, and Mediterranean, *neapolitana*, sp. n., Naples ; Sars, *l. c.* pp. 25–27.

Heterotanais, g. n. Female nearly as *Leptochelia* ; in the male the first pair of antennæ long and slender, with well-developed flagellum ; the

masticatory parts rudimentary; the immoveable finger of the chelipeds very short. *H. arstedi* (Kröyer, *Tanais*) = *balthicus* and *rhynchites* (F. Müller), Southern Norway, Denmark, and Coast of Pomerania, and *H. anomalus*, sp. n., Messina and Spezia, described: *Leptochelia limicola* (Harger), New England, and *Paratanais tenuis* (Thomson), New Zealand, also belong to this genus. G. O. Sars, *l. c.* pp. 29–31.

Paratanais batii, sp. n., = *forcipatus*, Bate, *nec* Lilljeborg, Southern Coast of England, Norway, and Mediterranean; *id. l. c.* p. 32.

Paratanais tenuicornis, sp. n., Haswell, P. Linn. Soc. N. S. W. vi. p. 194, pl. iv. fig. 3, and Cat. Austral. Crust. p. 307, Port Stephen, New South Wales.

Typhlotanais, g. n. No eyes, hinder part of the body well developed, equal in breadth to the anterior part; antennæ of the first pair tri-articulated in the female, much greater in the male, beset with fasciculate sensitive bristles; epistome prominent, globate; all pleopods well developed: abyssal. *T. tenuimanus* (Lillj., *Tanais*), *aquiremis* (Lillj.) = *depressus* (G. O. Sars), *brevicornis* (Lillj.), *finmarchicus*, *assimilis*, *tenuicornis*, *microcheles*, spp. nn., *cornutus* (G. O. Sars, *Paratanais*), *penicillatus*, sp. n., all from the coast of Norway, 30–300 fath., and *messinensis*, sp. n., Mediterranean. Sars, *l. c.* pp. 33–40.

Leptognathia, g. n. No eyes, body of the female narrow, elongate, hinder part composed of six distinct segments, more developed in the male, first pair of antennæ quadri-articulate in the female, much longer, with very large pencils of sensitive bristles in the male; maxillæ very small and weak; three pairs of ambulatory feet equal; all pairs of pleopods well developed. *L. longiremis* (Lillj., *Tanais*) = *T. islandicus* (G. O. Sars), *breviremis* (Lillj.), *brevimana* (Lillj.), *filiformis* (Lillj.), *laticaudata*, and ? *manca*, sp. n., all from the coast of Norway, the first also from Iceland, the third and fifth also in the Mediterranean, here described. To this genus belong also *Tanais gracilis* (Kröy.), *graciloides* (Lillj.), *Paratanais rigidus* (Bate), and *Leptochelia cæca* (Harger). Sars, *l. c.* pp. 40–45.

Pseudotanais, g. n. Body short, thick, the first three free segments very short, the last segment large; eyes absent or little developed; antennæ nearly equal in both sexes, tri-articulate; chelipeds also equal in both sexes; pleopods either absent in the female, or present in both sexes: *P. forcipatus* (Lillj., *Tanais*), *macrocheles*, *lilljeborgi*, and *meditJedi*[illegible]*us*, spp. nn., the first three from the coast of Norway, the last fro[illegible]*rotell*[illegible]a. Sars, *l. c.* pp. 46–49.

Caprellepe, g. n. Segments of the body separated by evident constricting caps; six segments in the hinder part; no eyes; antennæ like th[illegible]*anthifereptognathia*; pleopods and uropods of the female very short, biran[illegible] (Hp well developed in the male. *C. abbreviata* (G. O. Sars, *Tanais*), Fjord o[illegible] Christiania, and *veringii* (G. O. Sars), Arctic Sea, abyssal. Sars, *l. c.* pp. 49–51.

Haplocope, g. n. [illegible]ody narrow, six posterior segments; no eyes; pl[illegible]opods of the female very small, forming simple naked lamellæ; uropods rather long, biran[illegible]ous. *H. angusta*, sp. n., Southern Norway; only the female known. Sa[illegible]rs, *l. c.* pp. 51 & 52.

Strongylura, g. n. Body elongate, slightly narrowed in the middle, integument very hard; six posterior segments, the last large, rounded; no eyes; first pair of antennæ rather strong in the female, quadri-articulate; no pleopods, uropods very short. *S. cylindrica*, sp. n., Western Coast of Norway; only the female known. Sars, *l. c.* pp. 52 & 53.

Anarthrura, g. n. Body elongate; integument thin, nearly pellucid; hinder part of the body very short, not segmented, obtusely angulated; no eyes; antennæ of the first pair quadri-articulate in the female; pleopods absent, uropods imperfectly biramous, the outer branch being continuous with the stem. *A. simplex*, sp. n., Western Coast of Norway; only the female known. Sars, *l. c.* pp. 53 & 54.

Stenetrium, g. n. Abdomen short, one-jointed; head with a short rostrum; antennæ inserted on the anterior margin of the head, internal pair very short, external pair very long, both with well-developed flagella; maxillipeds expanded, operculiform; first pair of feet with a large prehensile hand, the following pairs ambulatory; first pair of abdominal appendages broad, operculiform; caudal appendages biramous. *S. armatum* and *inerme*, spp. nn., Port Jackson. Haswell, P. Linn. Soc. N. S. W. v. [1881] pp. 478 & 479, pl. xix., and Cat. Austral. Crust. pp. 308 & 309.

Apseudes tenuimanus, *echinatus*, *acutifrons*, and *robustus*, spp. nn., Sars, Arch. Math. Naturv. vii. pp. 12–16, all from the Mediterranean.

Apseudes obtusifrons, sp. n., Haswell, P. Linn. Soc. N. S. W. vi. p. 748, pl. vi., and Cat. Austral. Crust. p. 326, Port Jackson.

Apseudes australis, sp. n., *id. ll. cc.* p. 193, pl. iv. fig. 2, and p. 307, Broughton Islands, Australia, 25 fath.

Parapseudes, g. n. Distinguished from *Apseudes* by a less elongated body, the epimera of the first segment very small, and not spiniform in front, a stout spine on the epistome, sub-equal flagella in the first pair of antennæ, the appendicular lamella of the second pair being rudimentary, the mandibular palpus very small, and the last pair of pleopods quite obsolete. *P. latifrons* (Grube, *Apseudes*), Lussin, Adriatic, and Spezia, Mediterranean. Sars, *l. c.* pp. 17 & 18.

Sphyrapus (Norman, MS.), g. n. Male and female very unlike, male with more elongate body, the external flagellum of the first pair of antennæ copiously set with fasciculated sensitive bristles, chelipeds and fossorial feet very long, hand strong, "submalleolate." *S. anomalus* (G. O. Sars, *Apseudes*), Coast of Norway, and *serratus*, sp. n., Arctic Sea, abyssal. Sars, *l. c.* pp. 18–20.

Anthuridæ.

Anthura ? flagellata, sp. n., Chilton, Tr. N. Z. Inst. xiv. p. 172, ante[illegible]nnæ, periopods, abdomen, and telson, pl. viii. fig. 2 *a–d*, New Zealand[illegible].

Paranthura australis and *? crassicornis*, spp. nn., H[illegible]aswell, P. Linn. Soc. N. S. W. v. [1881] pp. 477 & 478, pl. xviii. figs. 1[illegible] & 5, and Cat. Austral. Crust. pp. 305 & 306, Port Jackson.

Haliophasma, g. n. Distinct from *Paranthura* [illegible] by well-developed flagella in both pairs of antennæ or the outer [illegible]air only, or by the second

and third pairs of periopods being simple, or only the second imperfectly subchelate. *H. purpurea*[*-reum*] and *maculata*[*-tum*], spp. nn., *id. l. c.* pp. 476 & 477, pl. xviii. figs. 2 & 3, and Cat. Austral. Crust. pp. 305 & 306.

Cruregens, g. n., near *Paranthura* (Bate). Telson and last pair of abdominal appendages as in *Haliophasma* (Haswell), but only six pairs of thoracic feet, the last (seventh) pair wanting. No eyes. *C. fontanus*, sp. n. From a pump at Eyreton, North Canterbury, New Zealand. Chilton, Tr. N. Z. Inst. xiv. p. 176, pl. x. figs. 1–12.

Idoteidæ (incl. Arcturidæ).

Arcturus longicornis and *brevicornis*, spp. nn., Haswell, P. Linn. Soc. N. S. W. vi. pp. 194 & 195, the latter pl. iv. fig. 5; Cat. Austral. Crust. pp. 303 & 304, Australia.

Arcturus furcatus, sp. n., Studer, SB. nat. Fr. 1882, pp. 56 & 57, Kerguelen, 60 fath.

Astacilla arietina and *dilatata*, spp. nn., Sars, Forh. Selsk. Chr. 1882, pp. 62 & 63, pl. ii. figs. 2 and 3, Norway, the latter also in the Mediterranean.

Arctur[*o*]*ides*, g. n. Intermediate between the *Arcturidæ* and *Idotheidæ*; body linear, cylindrical, without epimeral plates, pleon and telson forming a large caudal plate; external antennæ long, 5-jointed, with 3-jointed flagellum, prehensile; four anterior pairs of periopods short, unguiculate, their inner margin sharp, and provided with short, stiff bristles; the three following pairs longer, ambulatory. *A. cornutus*, sp. n., Kerguelen, 115 fath. Studer, *l. c.* pp. 57 & 58.

Glyptonotus sabinii (Krŏy.), Hoek, Crust. 'Willem Barents,' p. 30, pl. ii. figs. 11 & 12, Arctic Sea.

Colours of *Idotea tricuspidata* variable, in relation to the surrounding objects; Matsdorff, Diss. Inaug. 1882, 2 pls. See above, General Subject.

Idotea caudacuta, Victoria and Tasmania, and *excavata*, Tasmania, spp. nn., Haswell, P. Linn. Soc. N. S. W. vi. pp. 181 & 182, the former pl. iv. fig. 4; both also in Cat. Austral. Crust. pp. 276 & 277.

Cecidotea nickajackensis, sp. n., Nickajack Cave, Tennessee; Packard, Am. Nat. xv. p. 879, pl. vii. fig. 3.

Munnopsidæ.

Eurycope gigantea (G. O. Sars), Hoek, Crust. 'Willem Barents,' p. 34, pl. ii. figs. 18 & 19, Arctic Sea.

Eurycope latirostris, sp. n., Sars, Forh. Selsk. Chr. 1882, p. 67, pl. ii. fig. 6, Norway.

Asellidæ.

Asellus brevicauda and *intermedius*, spp. nn., and *stygius* (Packard) = *microcephalus* (Cope), all from Illinois, fully described by A. Forbes, Bull. Illin. Mus. i. [1876] pp. 8–13 & 22. *A. militaris*, sp. n., Hay, Illinois State Laboratory Bull. No. 2, p. 90, Abingdon, Illinois.

Janira brevirostris, sp. n., Sars, Forh. Selsk. Chr. 1882, p. 64, pl. ii. fig. 4, Norway.

Pleurogonium inerme, sp. n., *id. l. c.* p. 67, pl. ii. fig. 5, Norway.

Oniscidæ.

Porcellio, an albino specimen incidentally mentioned; Am. Nat. xvi. p. 243.

Porcellio obtusifrons, sp. n., Haswell, Cat. Austral. Crust. p. 280, Sydney.

Typhloniscus ? stygius, sp. n., Joseph, B. E. Z. xxvii. p. 11, Caves of Corgnate and Gabroviza, Carniola.

Titanethes fracticornis and *brevicornis*, spp. nn., *id. ibid.*, Caves of Carniola.

Platyarthrus hoffmanseggi (Brandt), living in ants' nests, is provided with eyes composed of several well-formed ocelli, but without pigment, and is sensitive to light; Eaton, Ann. N. H. (5) x. p. 458.

Armadillo officinalis (Dum.): note by Eaton, *l. c.* p. 360.

Armadillidium subdentatum, sp. n., Haswell, Cat. Austral. Crust. p. 279, Sydney and Tasmania.

Helleria (Ebner, early part of 1868) = *Syspastus* (Budde Lund, 1879), has priority over *Helleria* (Norman, December, 1868?, *Gammaridæ*; Eaton, *l. c.* p. 458.

Sphæromidæ.

Sphæroma aspera [*-rum*], *anomala* [*-lum*], and *lævis* [*-ve*], spp. nn., Haswell, P. Linn. Soc. N. S. W. v. [1881], pp. 472 & 473, pl. xvi. figs. 3–5, and Cat. Austral. Crust. pp. 288 & 289, Port Jackson and Sydney.

Sphæroma ? aculicaudata [*-tum*], sp. n., *id. op. cit.* vi. p. 191, pl. iii. fig. 9, Victoria, Australia. Transferred to *Cerceis*; id. Cat. Austral. Crust. p. 294.

Cymodocea pubescens (M.-Edw., *Sphæroma*), *aculeata*, and *mammifera*, spp. nn., the first two Port Jackson, the last Port Denison; Haswell, *op. cit.* v. [1881] pp. 473 & 474, pls. xvii. fig. 1, xvi. fig. 6, and xviii. fig. 1, the first two also in his Cat. Austral. Crust. pp. 290 & 291.

Cymodocea bidentata, *trispinosa*, and *coronata*, Griffiths Point, Victoria (Australia), and *tuberculata*, Port Stephens, spp. nn., Haswell, *op. cit.* vi. pp. 189–191, the second and fourth pl. iii. figs. 7 & 8, also in his Cat. Austral. Crust. pp. 291 & 292; the second transferred to *Cerceis*, l. c. p. 295.

Calyptura, g. n. General form of body as in *Cymodocea*, but abdomen short, bi-segmented, concealed by the last thoracic segment. *C. carv*[illegible] sp. n., Haswell, *op. cit.* v. [1881] p. 476, and Cat. Austral. Crust. [illegible] xvii. Port Jackson, common, ½ inch.

Cilicæa tennicaudata and *crassicaudata*, spp. nn., *id.* [illegible] p. 475, pl. [illegible]hens, figs. 2 & 3, Port Jackson and Port Denison. *C. hystrix*, Port Step[illegible] Jack- *spinulosa*, Port Jackson, *curtispina*, Port Phillip, and *crassa*, Port [illegible] 1–4, son, spp. nn., *id. op. cit.* vi. pp. 183–186, the first three pl. iii. figs. also in his Cat. Austral. Crust. pp. 295–298.

Zuzara (Leach) *integra*, sp. n., common in Port Phillip, also in Tasmania, and *Z. emarginata*, sp. n., Western Port, Australia, *id. l. c.* pp. 186–188, pl. iii. figs. 5 & 6, and Cat. Austral. Crust. pp. 299–301.

Cerceis; see *Sphæroma* and *Cymodocea*.

Cirolanidæ.

Cirolana microphthalma, sp. n., Hoek, Crust. 'Willem Barents,' p. 28, pl. ii. figs. 13–17, Arctic Sea, 73° N. lat., 30° E. long., 166 fath.

Cirolana lata, sp. n., Haswell, P. Linn. Soc. N. S. W. vi. p. 192, and Cat. Austral. Crust. p. 286, off Broughton Islands, near Port Stephens, New South Wales, 25 fath.

Ægidæ.

Ægа cyclops, sp. n., Haswell, *l. c.* p. 192, and Cat. Austral. Crust. p. 285, Port Jackson.

Codonophilus, g. n. Distinct from *Ægа* by the sudden narrowing of the body at the commencement of the abdomen and the uniramous character of the caudal appendages. *C. argus*, sp. n., found under the bell of a *Rhizostoma* at Port Jackson. Haswell, *op. cit.* v. [1881] p. 471, pl. xvi. fig. 1, and Cat. Austral. Crust. p. 283.

Rocinela vigilans, sp. n., *id. l. c.* p. 472, pl. xvi. fig. 2, and Cat. Austral. Crust. p. 285, Holborn Island, near Port Denison, 20 fath.

Cymothoidæ.

Harponyx, g. n. Head triangular, posterior half of the body much narrower than the anterior; no eyes; only six pairs of feet, the three anterior prehensile with strong claws, the three posterior with a hook-like terminal joint; all pleopods well developed, natatory. *H. pranizoides*, sp. n., Norway; Sars, Forh. Selsk. Chr. 1882, p. 60, pl. ii. fig. 1.

Ourozeuktes [*Urozeuctes*], second species from Australia; Haswell, Cat. Austral. Crust. p. 284.

Bopyridæ.

The external and internal structure of the *Bopyridæ* is discussed anatomically and microscopically, and an analytical table of the known genera given by R. Walz, Arb. z. Inst. Wien, iv. 2, pp. 125–183, pls. i.–iv.

Bopyrus squillarum (Latr.), and *virbii* (Walz), Adriatic, both sexes fully described; *id. l. c.* pp. 183–187 (59–63), pl. i.

Bopyrus palæmoneticola (Packard), in *Palæmonetes vulgaris* (Say), and series of its developmental stages; Gissler, Am. Nat. xvi. pp. 6–12. Also in Q. Jl. Micrógr. vi. No. 3, pp. 123–129.

Bopyroides latreuticola, sp. n., parasitic on the gulf-weed shrimp; Gissler, Am. Nat. xvi. pp. 591–594.

Phryxus. Notes on the differences and synonymy of various species, *Pleurocrypta* (Hesse), *Daius* (Kröy.), *Athelque* (Hesse), *Leydia* (Cornalia), and *Cepon* (Duv.) united with this genus; Walz, *l. c.* pp. 182 &

183. *P. abdominalis* (Krŏy.) = *hippolytes* (Rathke), from the pleon of *Hippolyte* and *Virbius*, Adriatic, both sexes described; *id. l. c.* pp. 190–192 (66–68), pl. iv. figs. 34 & 35.

Leptophryxus mysidis (Buchholz); Hoek, Crust. 'Willem Barents,' p. 37, pl. ii. figs. 23–25, Arctic Sea.

Notophryxus, g. n., for *Leptophryxus clypeatus* (Sars), and *N. oroides*, sp. n., both from Norway, the latter on the third abdominal segment of *Amblyops abbreviata* (Sars). Sars, Forh. Selsk. Chr. 1882, p. 71, pl. ii. figs. 9–11.

Aspidophryxus, g. n.: female symmetrical, shield-shaped, back with 5 transverse sutures, sides expanded; no eyes, antennæ rudimentary, 5 pairs of legs. Male linear, distinctly segmentated, head soldered with the first thoracic segment; hinder part of the body consisting of two distinct segments. *A. peltatus*, sp. n., Norway, on the back of *Erythrops*. Sars, *l. c.* p. 72, pls. xii.–xv.

Gyge branchialis (Cornalia & Panceri), male and female described, from the branchial cavity of *Gebia litoralis*, Adriatic; Walz, *l. c.* pp. 189 & 190 (65 & 66), pl. iv. figs. 29, 32 & 33.

Gyge hippolytes (Krŏy.); Hoek, Crust. 'Willem Barents,' p. 35, pl. ii. figs. 20–22, Arctic Sea.

Cryptothiria cypridinæ, sp. n., within the shell of *Cypridina norvegica*, Lofoten Islands, and *marsupialis*, sp. n., in the breeding pouch of *Eurycope cornuta* and *Ilyarachna longicornis*, Southern Norway; Sars, *l. c.* pp. 73 & 74, pl. ii. figs. 17–23.

Microniscus calani, sp. n., Lofoten Islands, on *Calanus finmarchicus*; *id. l. c.* p. 69, pl. ii. fig. 18.

Pleurocrypta affinis, sp. n., Norway, under the cephalothorax of *Pandalus leptorrhynchus*; id. *l. c.* p. 68, pl. ii. figs. 7 & 8.

Entoniscidæ.

Kossman's paper on the *Entoniscidæ*, containing a general sketch of them, and special description of *Entione moniezi* (Giard) [Zool. Rec. xviii. *Crust.* pp. 2 & 33], is translated in Ann. N. H. (5) x. pp. 81–99, pl. ix.

Nearly adult females of *Entoniscus* are distinctly segmented, with 7 segments in the perion, 6 in the pleon, and provided with short rudiments of feet, without articulation, and 5 pairs of breeding lamellæ; the bag, in which they are included, consists of the coagulated blood of their host. Kossmann, Zool. Anz. 1882, pp. 58 & 59.

PHYLLOPODA.

Branchipodidæ.

Branchipus pellucidus, sp. n., Joseph, B. E. Z. xxvi. p. 1, Caves of Ober-gurk, Cumpole and Podpèc, Carniola; no eyes.

Eubranchipus serratus, sp. n., A. Forbes, Bull. Illin. Mus. i. [1876] pp. 13 & 22, Illinois; *E. bundii*, id. *l. c.* p. 25, Jefferson, Wisconsin.

Branchinecta paludosa (Müll.), on its structure and geographical distribution, by A. Wierzejski, see title *suprà*.

Artemia salina (L.). C. Briquel has published a note (Nancy: 1882, 8vo, 10 pp.), not seen by the Recorder.

Apodidæ.

Apus productus (Bosc.), found in Moravia; Makowsky, Verh. Ver. Brünn, xx. p. 20.

Limnadiidæ.

Limnadia garretti, sp. n., Richters, Abh. senck. Ges. 1882, 2 pp., pl. i. figs. 11–19, Huaheine, Society Islands. Only females have been seen.

Limnetis, sp. n. ?, from Wisconsin; Bundy, Tr. Wiscons. Ac. v. p. 184.

"*Estheria* or *Hedessa cæca*," sp. n., Joseph, B. E. Z. xxvi. p. 2, Caves of Gurk and Podpèc, Carniola. Allied to *Limnetis brachyura* (Müll.), but eyeless.

CLADOCERA.

Daphniidæ.

The embryo of *Daphnia schæfferi*, before leaving the egg, in both summer and winter forms, is furnished with palpi on the base of the second antennæ, and a long spine in the dorsal region of the shell, which seems to serve as an aid to the complete moulting of the walls of the brood-cavity; the young specimens, if confined in an aquarium, retain the dorsal spine and the shorter form of the body till in a sexually mature condition; Herrick, Zool. Anz. 1882, pp. 234 & 235. Abstract in J. R. Micr. Soc. (2) ii. p. 506.

Lyncodaphnia, g. n. General shape as in *Alona*, upper antennæ like those of *Macrothrix*, attached moveably to the end of a blunt prominence beneath the head; second antennæ slender, their four-jointed ramus with 3 long setæ and a stout thorn at the end of the distal segment, three-jointed ramus as in *Macrothrix*; intestine twice convoluted. *L. macrothroides*, sp. n., Lake Minnetonka, Minnesota. Herrick, Am. Nat. xvi. pp. 1006 & 1007, pl. xvi. He proposes to form a distinct family, *Lyncodaphn[i]dæ*, containing the genera *Macrothrix*, *Lyncodaphnia*, *Drepanothrix*, *Lathonura*, and *Ilyocryptus*.

Polyphemidæ.

…ra [-dora] pellucida, sp. n., Joseph, B. E. Z. xxvii. p. 3, Caves …and S. Canzian, Carniola. Eyes replaced by a touching hair.

OSTRACODA.

Cypridæ.

…eph, *op. cit.* xxviii. p. 4, Cave of Podpèc, Car-

Typhlocypris, subg. n. of *Cypris*, without eyes. *C. eremita*, sp. n., quite white, adult eyeless, in young stage with black spots in the place of the eyes, found copiously in several wells in Prague, creeping on mud; observed in various seasons, but always only females. Vejdovsky, Thierische Organismen der Brunnenwässer von Prag, p. 64, pl. vii. fig. 6, fully described; also mentioned by the same in "O puvodu Fauny studnicne," Prague: 1880, p. xlix.

COPEPODA.

W. Giesbrecht has published a valuable work (title, see *suprà*), describing and figuring 23 species of free Copepods observed in the inlet of Kiel; he points out many secondary sexual differences, and supposes that the anterior appendages of the antennæ, which are found in both sexes and all ages, may be destined to distinguish the quantity of salt in the water. He proposes to divide the free Copepods in two groups; *Gymnopleoda*, pleon without feet, and *Podopleoda*, a pair of feet on the first segment of the pleon.

Popular note on some Northern Copepods, and their use as food for fish, with woodcuts representing *Cyclops canthocamptoides*, *Œthona spinirostris*, *Dias longiremis*, *Temora longicornis*, and *Irenæus patersoni*, by F. Heincke, in his work, "Die nutzbaren Tiere der nordischen Meere," 1882, pp. 18–29.

The hitherto known genera of Copepods living parasitically on Mollusks, reviewed by C. Aurivillius, Œfv. Ak. Förh. 1882, No. 3, pp. 31–34, and No. 8, pp. 48 & 49. The author also reviews 21 species of Copepods living parasitically on *Tunicata*, and found on the Swedish Coast, *l. c.* pp. 45–48, and *tom. cit.* No. 8, pp. 108–114.

Cyclopidæ.

Cyclops. A. Fric, Zool. Anz. 1882, pp. 502 & 503, subdivides this genus into two groups:—

1. The *Dolichopoda*. Body in the Nauplius- and Metanauplius-stages oval, all feet natatory, long, the third pair provided with a long natatory branch; antennal gland straight. *C. viridis*, *signatus*, *tenuicorn*[illegible] and *elongatus*.

2. The *Brachypoda*. Metanauplius-stage compressed, third [illegible] appendages crooked, serving only for seizing the food. *C. s*[illegible] *fimbriatus*, and *canthocamptoides*.

Cyclops pulchellus (Koch), *nanus* (Sars), and *fimbriatus* (F[illegible] in wells at Prague; Vejdovsky, Thier. Organ. p. 63, pl. v[illegible]

Cyclops hyalinus, Cave of Planina and Mrzla jama[illegible] Cave of Cumpole, both in Carniola, spp. nn., Jo[illegible] pp. 5 & 6. Both eyeless.

Cyclops insectus, sp. n., Forbes, Am. Nat. x[illegible] Michigan.

Harpacticidæ.

Canthocamptus illinoisensis, sp. n., A. Forbes, Bull. Illin. Mus. i. [1876] pp. 14 & 23, Illinois.

Calanidæ.

Diaptomus sanguineus, sp. n., Forbes, Bull. Illin. Mus. i. [1876] pp. 15 & 23, Illinois.

Diaptomus sicilis, leptopus, and *stagnalis*, id. Am. Nat. xvi. pp. 645–647, pl. viii. figs. 9–20.

Osphranticum, g. n., near *Diaptomus*, for *O. labronectum*, sp. n., Forbes, Am. Nat. xvi. p. 645, pl. viii. figs. 24–29.

Lucullus acuspes (Giesbr.), identified with *Clausia elongata* (Boeck); Giesbrecht, *l. c.*

Halitemora (Giesbr.), identified with *Temora*, s. str. (Claus.), and *Eurytemora* (Giesbr.) with *Temorella* (Claus); Giesbrecht, *l. c.*

Bathynella, g. n., "incertæ sedis." Semicylindrical, two pairs of antennæ, the first 8-, the second 7-jointed, mandibles strong, toothed; no eyes; 7 thoracic and 6 abdominal segments, all free; each thoracic segment bearing a pair of natatory biramous feet, the first two abdominal segments with uniramous natatory feet, the following without feet, the last with a dorsal and a ventral pair of bristle-bearing caudal appendages. *B. natus*, sp. n., 1 mm. long, whitish, in a well in Prague. Vejdovsky, Thier. Organ. p. 65, pl. viii.

Corycæidæ.

Modiolicola, g. n. Distinct from *Lichomolgus* by the inner branch of the fourth pair of feet being 3-jointed, the first four pairs being equal, except in the bristles, and only the fifth not well developed. *M. insignis*, sp. n., Gulmars Fjord, in Bohuslän, between the gills of *Modiola vulgaris* and *Mytilus edulis*. Aurivillius, Œfv. Ak. Förh. 1882, No. 3, pp. 39–44, pl. vi. figs. 1–10, female; *l. c.* No. 8, pp. 43–48, pl. xiii. figs. 1–8, male, female, and Nauplius-stage.

Notodelphyidæ.

Notodelphys allmanni, rufescens, cærulea, agilis, prasina, tenera, and *elegans* (Thorell), observed on the coast of Bohuslän on Ascidians, and described by Aurivillius, *l. c.* No. 3, pp. 58–62, pl. v. fig. 17, and No. 8, pp. 70–95, pls. xv. figs. 4–18, & xvi. figs. 1–8.

Notodelphys prasina (Thorell), within the gill sac of *Phallusia* at Naples; Giesbrecht, MT. z. Stat. Neap. iii. p. 296.

Doropygus longicauda, sp. n., in *Phallusia obliqua* (Alder), *thorelli*, sp. n., on *Phallusia mentula, pulex, psyllus, gibber, auritus* (Thorell) with var. *elongatus* (Buchholz), all observed on the coast of Bohuslän, and described by Aurivillius, *l. c.* No. 3, pp. 48–56, pls. vi. figs. 11 & 12, & vii., and No. 8, pp. 42–67, pls. xiii. figs. 10–12, xiv. figs. 1–14, & xv. figs. 1–3.

Doropygus (Thorell) and *Notopterophorus* (Costa). The known species enumerated and described; the latter is to be considered only as a subgenus of the former. *D.* (*N.*) *papilio* (Hesse) and *elongatus* var. *elatus* (Costa), found in the gill-sac of *Phallusia mentula* (Müll.), and *D.* (*N.*) *elongatus* (Costa) in that of *P. mamillata* (Cuv.), the external and internal structure of all three comparatively described; the external appendages of the parasitic animals are probably caused by the abundance of nourishment, which is stored up in the form of fat near the cuticle. Giesbrecht, MT. z. Stat. Neap. iii. pp. 298–372, pls. xxii.–xxiv. Critical remarks on this paper by Aurivillius, Œfv. Ak. Förh. 1882, pp. 67–70.

Botachus cylindratus (Thorell), Bohuslän, on *Phallusia obliqua* and *mentula*, Aurivillius, *l. c.* No. 3, pp. 63–65, pl. v. figs. 14–16. The same observed at Naples in the branchial sac of *Phallusia*, the adult female in the rectum, by Giesbrecht, MT. z. Stat. Neap. iii. p. 296.

Gynentophorus globularis (Costa) found on the coast of Bohuslän on *Styela grossa*, *Phallusia obliqua* and *mentula*, and described by Aurivillius, *l. c.* pp. 56–58; genital organs, and No. 8, p. 70, pl. xiii. fig. 13.

Ascidiicola rosea (Thorell). Antennæ and buccal organs described; *id. l. c.* No. 8, pp. 93–96, pl. xvi. figs. 13–22.

Buprorus loveni (Thorell); *id. l. c.* No. 3, p. 63, pl. v. fig. 13, first antenna.

Ergasilidæ.

Ergasilus sieboldi (Nordm.), observed on the gills of the herring at Kiel; Giesbrecht, iv. Bericht d. Commiss. z. Untersuch. d. deutschen Meere, p. 88.

Ergasilus centrarchidarum, sp. n., R. Wright, P. Canad. Inst. i. p. 244, pl. i. figs. 12–18, Canada, on the gills of *Ambloplites rupestris*, *Eupomotis aureus*, and *Lepomis auritus*; only females observed.

Lichomolgus agilis (Leydig, *Doridicola*) on *Doris tuberculata* and *verrucosa*, Gullmarsford, Bohuslän, male and female described; Aurivillius, *l. c.* No. 3, pp. 34–38, pl. v. figs. 1–12, and No. 8, pp. 42 & 43, pl. xiii. fig. 9.

Ascomyzontidæ.

Ascomyzon lilljeborgi (Thorell), Bohuslän Coast, on *Phallusia virginea*, described; *id. l. c.* No. 8, pp. 105–107, pl. xvi. figs. 23–26.

Lernæidæ.

Peroderma bellottii, sp. n., Ricchiardi, P.v. Soc. Tosc., May, 1882, and Zool. Anz. 1882, p. 475, Mediterranean, on *Scopelus benoiti*.

Chondracanthidæ.

Chondracanthus. The known species of the Mediterranean and *C. ninnii*, sp. n., on *Gobius panizzæ*, described; Ricchiardi, P.v. Soc. Tosc., July, 1882, and Zool. Anz. 1882, p. 504.

Lichomolgus albens, *forficula*, and *furcillatus* (Thorell) observed on the coast of Bohuslän, on *Phallusia*, *Corella*, and *Ciona*, described; Aurivil-

lius, *l. c.* No. 8, pp. 98–104, parts of the former two figured, pl. xvi. figs. 9–12.

Lichomolgus forficula (Thorell), semi-parasitical between tunica and gill-sac on *Phallusia*; Giesbrecht, MT. z. Stat. Neap. iii. pt. 2, pp. 295 & 296.

Lamippe duthiersi, sp. n., Joliet, Arch. Z. expér. x. pp. 101–111, pl. vi. Mediterranean, on *Paralcyonium elegans* (M.-Edw.).

Lernæopodidæ.

Lernæopoda selachorum (?). Note on the male by F. Vejdovsky, in Anzeig. 2 Versamml. böhm. Ärzte u. Naturf. 1882, p. 58.

Lernæopoda edwardsi (Olsson), on the gills of *Salmo fontinalis*, Canada, described by R. Wright, P. Canad. Inst. i. pp. 246–248, pl. i. figs. 1–11.

Achtheres micropteri, sp. n., *id. l. c.* pp. 249–253, pl. ii. figs. 1–10; spermatophores, fig. 11, Canada, on *Micropterus salmonoides*.

Diarthrodes, *Bæckia* [|| Malm., *Amphipoda*, 1870], *Conostoma* [preoccupied in *Aves* and *Pisces*], and *Xouthous*, gg. nn. of Copepods, G. Thomson, N. Z. J. Sci. i. p. 185. [Not seen by the Recorder.]

CIRRIPEDIA.

Balanus porcatus (Dacosta), *crenatus* (Brug.), and *balanoides* (L.), specific characters and occurrence on the coast of Bohuslän; Malm, Göteb. Mus. Arsskr. iii. [1881] p. 28.

Variation of *Balanus* at Bass Rocks, Mass.; Leidy, P. Ac. Philad. 1882, p. 224.

Scalpellum nymphicola, sp. n., on the legs of *Nymphon robustum* (Bell), North Atlantic; Hoek, Report on the *Pycnogonida* of the 'Challenger' Exp., pp. 98 & 144.

8 species of *Peltogastridæ* observed on the coast of Bohuslän, and their hosts, indicated by Malm, *l. c.* pp. 30–32.

XIPHOSURA.

A. S. Packard combats E. Ray Lankester's paper, "*Limulus* an Arachnid" [Zool. Rec. xviii. *Crust.* p. 37], adducing the late Willemoës-Suhm's statement, that the development of *Limulus rotundicauda* passes through a Nauplius-stage; Am. Nat. xvi. pp. 287–292, also Ann. N. H. (5) x. pp. 369–374. H. N. Moseley replies that these larvæ were not those of *Limulus*, but belonged to some Cirriped, as Willemoës-Suhm himself was convinced afterwards; Ann. N. H. (5) ix. p. 412: *cf.* also Nature, xxv. p. 582.

Hagen repeats a former observation concerning the moulting of *Limulus*; Nature, xxv. p. 126.

Ryder and Gissler publish some observations on the parasites of *Limulus*; Am. Nat. xvi. pp. 48–52.

ARACHNIDA.

BY

THE REV. O. P. CAMBRIDGE, M.A., C.M.Z.S. &c.

(Assisted by F. M. CAMPBELL, F.L.S., &c.)

LIST OF GENERAL PUBLICATIONS.

BECKER, LÉON. Les Arachnides de Belgique. Première Partie. Ann. Mus. Belg. x. pp. 1–246, pls. i.–xxvii.

Forms the beginning of a grand work on Belgian Arachnids, intended to include the Orders *Araneæ* (Sund.) [*Araneidea*, auctt.], *Chernetes*, Sim. [*Pseudoscorpiones*], and *Opiliones*, Sund. [*Phalangiidea*]. The present portion includes five families of *Araneidea*, comprising 121 known species, distributed variously among 37 genera. The systematic arrangement adopted is that of Eugène Simon in "Arachnides de France." All the species are fully figured, with many additional details of structure and economy, and in a short introduction figures and descriptions are given of those parts of external structure upon which classification depends. A large number of synonyms is quoted, and careful details of geographical distribution are given. The execution of the plates is excellent, and, so far as it has proceeded, the work may be described as bringing together (*quoad* Belgian Spiders), in an illustrated form, the great works of Thorell ("Synonyms of European Spiders") and Simon ("Arachnides de France").

——. Communications Arachnologiques. CR. Ent. Belg. xxvi. pp. xxxiv.–xxxix.

Gives lists of Arachnids of various Orders from, i., neighbourhood of Toulon, *Araneidea* 41 species, *Scorpiones* 1, *Opiliones* 1; ii. neighbourhood of Sospel, *Araneidea* 50 species, *Scorpiones* 1, *Opiliones* 3, *Pseudoscorpiones* 1; iii. neighbourhood of St. Martin-Lantosque, *Araneidea* [illegible] species, *Scorpiones* 1, *Opiliones* 8, *Pseudoscorpiones* 1, all of known species.

BERLESE, A. Acari, Miriapodi, e Scorpioni Italiana. Padova: pls.

This work is in course of publication, and is without pagination. The parts issued in 1882 refer to *Acaridea*.

BRODIE, P. B. On Fossil *Arachnida*, including Spiders and Scorpions. P. Warw. Club, 1882, pp. 9–19.

A general account of the published records of *Arachnida* hitherto found in a fossil state. The small number of *Araneidea* as yet met with is remarked upon. This paucity, it is stated, is likely to be soon made up by researches in North America, where, in the Tertiary Lake Basin of Florisant, Colorado, 250 species of *Arachnida*, 190 being *Araneidea*, have been found. On this fine collection a paper has lately been published [June, 1883] by Scudder. The comparative rarity of *Araneidea* in the older formations still remains a fact. No example of this Order has yet been found in Great Britain.

CANTONI, ELVEZIO. Di alcuni Aracnidi di Puglia. Boll. scient. (May) 1882, pp. 1–4 (sep. copy).

Attempts a determination of some of the Arachnids of Apulia recorded and described in 1741 by Nicolo Caputo under the genus *Phalangium*, each species distinguished only by a number, though including species of more than one Order. A list of Arachnids recently collected at Altamuna is also given. The species included are 39, belonging to the Orders *Aranecidea* (34 spp.), and *Phalangiidea* (5), all known.

DALLAS, W. S. Cassell's Natural History. (London: 1882, 4to.) vi. *Arachnida*, pp. 158–188, woodcuts.

A popularly written account of the class *Arachnida*, which is divided into six Orders:—1, ARTHROGASTRA, containing *Scorpionidæ*, *Phrynidæ*, *Cheliferidæ*, *Phalangiidæ*, *Solpugidæ*. 2. ARANEIDEA, containing only the true Spiders. 3. ACARIDEA, containing the various families of Mites. 4. TARDIGRADA. 5. LINGUATULINA. 6. PANTOPODA (Pycnogonids). No systematic division of the Scorpions, Chelifers, or Phalangids is attempted, but the *Aranecidea* are divided into two tribes:—i. *Tetrapneumones*, with one family (*Mygalidæ*); ii. *Dipneumones*, with six families (*Salticidæ*, *Lycosidæ*, *Thomisidæ*, *Tegenariidæ* or *Tubitelæ*, *Theridiidæ*, and *Epeiridæ*). The *Acaridea* are divided into seven families, *Bdellidæ*, *Trombidiidæ*, *Hydrachnidæ*, *Oribatidæ*, *Gamasidæ*, *Ixodidæ*, *Acaridæ*.

JOSEPH, G. Systematisches Verzeichniss der in Tropfsteingrotten von Krain einheimischen Arthropoden, nebst Diagnosen der vom Verfasser entdeckten und bisher noch nicht beschreibenen Arten. B. E. Z. 1882, pp. 14–22.

The *Arachnida* comprise various species (mostly new) of different families of the Orders *Acaridea*, *Arctiscoidea*, *Chernetina*, *Aranecidea*, and *Phalangiidea*. Three new genera of *Aranecidea* are also characterized, one in *Lycosidæ*, and two in *Theridiidæ*.

KARSCH, F. Ueber ein neues Spinnen-thier aus der Schlesischen Steinkohle und die Arachniden der Steinkohlen-formation überhaupt. Z. geol. Ges. 1882, pp. 556–561, pl. xxi.

Characterizes a new order of Arachnids, apparently most nearly allied to the Order *Phalangiidea*—*Anthracomarti*[*dea*]—and divides it into two families and three genera, one of which (containing one new species) is

characterized as new, from Silesia. A list of other Arachnids found in the coal formations of Europe and America is also given:—*Aranecidea* (*Aranew*), 1 species from Silesia, *Phalangiidea* (*Opiliones*), 1 species from Saxony, and *Scorpionidea* (*Scorpiones*), 2 species from Illinois, 1 from England, and 2 from Bohemia.

Koch, Ludwig. Zoologische Ergebnisse von Excursionen auf den Balearen. ii. Arachniden und Myriapoden. Verh. z.-b. Wien, xxi. pp. 625–678, pls. xx. & xxi.

Describes 28 spp. nn. of *Aranecidea*, 1 sp. n. of *Pseudoscorpiones*, 2 of *Phalangiidea*, and 3 of *Acaridea*.

Köppen, F. T. Ueber einige in Russland vorkommende giftige und vermeintlich giftige Arachniden. Beitr. Russ. Reiches (2) iv. [1881], pp. 180–226.

A paper on—i. *Lathrodectus* 13-*guttatus*, Rossi, its distribution, habits, and injurious effects of its bite (pp. 183–207); ii. *Trochosa singoriensis*, Laxm. (pp. 207–219); iii. the Scorpions (6 known species being recorded) inhabiting Russian territory (pp. 219–221); and, iv. *Solpugidea*, 2 species (both known) are recorded (pp. 221–224).

Lankester, E. Ray. *Limulus* an Arachnid. Q. J. Micr. Sci. (2) xxi. [1881] pp. 1–87, pl. xxviii.

An elaborate anatomical comparison of *Limulus* with the Scorpion, resulting in the conclusion that the former is an ancestor of the latter. In this paper, Arachnids are divided into three grades:—A. *Hæmatobranchia*, including three Orders, *Trilobitæ*, *Eurypterinæ*, and *Xiphosura*. B. *Aerobranchia*, containing three Orders, *Scorpionina*, *Pedipalpi*, *Aranecina*. C. *Lipobranchia*, comprising four Orders, *Solifugæ*, *Pseudoscorpiones*, *Opilionina*, and *Acarina*. Scorpions are supposed to have given rise to the whole series of living *Arachnida*, to the *Pedipalpi* first, and through them to the *Aranecina*, and thence to the *Acarina*. *Galeodes* is considered to be a special development from the *Scorpionina*, as (in a different direction) are also the *Opilionina* and *Pseudoscorpiones*.

Macleod, J. Recherches sur la structure et la signification de l'appareil respiratoire des Arachnides. Bull. Ac. Belg. (3) iii. pp. 779–792. [*Cf. l. c.* pp. 457–459, and J. R. Micr. Soc. (2) ii. pp. 610–612.]

The author compares the breathing organs of Arachnids with the gills of *Limulus* in reference to Lankester's observations on that subject, with which he agrees. He doubts the protracheate nature of *Peripatus*, and suggests that the breathing organs of *Arachnida* and *Insecta* are not homologous.

Packard, A. S. Is *Limulus* an Arachnid? Am. Nat. xvi. pp. 287–292. [*Cf.* Ann. N. H. (5) ix. pp. 369–374, and *Crustacea*, antea p. 39.]

The author criticizes unfavourably Lankester's paper noticed in Zool. Rec. xviii. *Crust.* p. 37 [and now again recorded, *supra*], considering that Lankester has mistaken analogies for affinities, and showing the far closer structural affinity of *Limulus* to the *Crustacea* than to the *Arachnida*, to which he maintains *Limulus* has in fact no true affinity. Letters

are quoted from the late R. von Willemoës-Suhm in support of the Crustacean origin of *Limulus*. H. N. Moseley, Nature, xxv. p. 582, states that the latter had totally, and on good evidence, altered his views before his death.

Simon, Eugène. Viaggio ad Assab nel mar Rosso dei Signori G. Doria ed O. Beccari con il R. Avviso 'Esploratore,' dal 16 Novembre 1879, al 26 Febbraio 1880. ii. Étude sur les Arachnides de l'Yemen méridional. Ann. Mus. Genov. xviii. pp. 207–260, pl. viii.

Records and describes *Solpugidea* (*Solifugæ*), 4 spp. (3 new), *Pseudoscorpiones* (*Chernetes*) 1 sp. n., *Araneidea* (*Aranea*) 43 spp. (22 new), *Scorpiones* 7 spp. (6 new).

——. Aracnidi raccolti da G. Cavanna al Vulture, al Pollino, ed in altri luoghi dell' Italia meridionale e centrale, nei mesi di Luglio ed Agosto 1880. Bull. Ent. Ital. xiv. pp. 31–48.

Records 73 spp. of *Araneidea*, 2 (*Attus* and *Gnaphosa*) new, 16 spp. of *Phalangiidea* (*Opiliones*), 4 new, *Scorpionidæ* (*Scorpiones*) 2.

——. Aracnidi raccolti a Lavaiano (Provincia di Pisa) da G. Cavanna. *L. c.* pp. 356–366.

Contains a list, with notes, of 78 species of *Araneidea* of various families, 1 species of *Chernetidæ* (*Pseudoscorpiones*), 1 of *Scorpiones*, and 5 of *Opiliones* (*Phalangiidea*), all known species.

Angus, J., in Am. Nat. xvi. p. 1010, states that if he puts a white variety of the "little flower Spider" on a sunflower, it will become quite yellow in from two to three days. The normal varieties are white and yellow.

ARANEIDEA.

Anthony, J. On the Threads of Spiders' Webs. J. R. Micr. Soc. (2) ii. pp. 170–172 [included in error in preceding Zool. Rec.].

The author details experiments on *Epeira diadema*, which was made to spin its thread in such a way that the whole, or a greater part, of the component strands remained separate, instead of coalescing. The number of filaments was always below 200, and as the spinnerets probably exceed 1000 in number, it is concluded that all of them are not used at the same time, or that some of them have different functions. For discussion, see *l. c.* p. 142.

Beneden, E. van. Note sur un Cténide originaire du Brésil trouvé à Liége. Bull. Ac. Belg. (2) xlix. [1880]. pp. 655–659.

The Spider described is a species of *Isoctenus*, probably imported with Brazilian plants.

Bertkau, Philip. Ueber das Cribellum und Calamistrum. Ein Beitrag zur Histologie, Biologie, und Systematik der Spinnen. Arch. f. Nat. xlviii. pp. 316–362, pl. xviii. figs. 1–22.

Describes the structure of the cribellum, or supernumerary mammillary organ of *Amaurobius ferox*, C. Koch, and the calamistra of that and

other species. The groups *Orbitelariæ* and *Retitelariæ* are considered unfit for systematic arrangement, representing merely economic characters. The author's group *Cribellata* includes all the genera characterized by the cribellum and calamistrum, and is divided into nine families—*Zoropidæ*, *Miagrammopidæ*, *Filistatidæ*, *Œcobiidæ*, *Dinopidæ*, *Uloboridæ*, *Dictynidæ*, *Eresidæ*, and *Amaurobiidæ*. The author accounts for the absence of the calamistrum in adult males of the group, as the probable result of this sex not forming snares in the adult stage.

An abstract of this author's memoir on the structure and function of the so-called liver in Spiders [Zool. Rec. xviii. *Arachn.* p. 6] is given in J. R. Micr. Soc. (2) ii. pp. 39 & 40.

Becker, in his work (*suprà*) on Belgian Spiders, records 33 species of 16 genera of *Attidæ* (*Salticidæ*), 6 genera and 37 species of *Lycosidæ*, 1 genus and 3 species of *Oxyopidæ*, 1 genus and 2 species of *Sparassidæ*, and 46 species and 13 genera of *Thomisidæ*.

Butler, A. G. On some new Species of the Genus *Cœrostris* from Madagascar. Ann. N. H. (5) x. pp. 100–106, pl. vi.

Describes as new, 5 species from Madagascar.

——. On some new or little known Spiders from Madagascar. P. Z. S. 1882, pp. 763–768, pl. lvii.

Records 7 species (6 new) of several families and genera.

Cambridge, O. P. On new Genera and Species of *Araneidea*. P. Z. S. 1882, pp. 423–442, pls. xxix.–xxxi.

Describes, from various widely separated regions, 16 species of *Araneidea* (15 new), and characterizes 9 new genera of *Drassidæ* (2), *Theridiidæ* (5), *Poltidæ* (1), *Salticidæ* (1).

——. External Parasites of Spiders. Ent. xv. p. 216.

Notes the breeding of a Hymenopterous parasite (*Acrodactyla degener*, Haliday) from larvæ adhering to the abdomen of *Linyphia obscura*, Bl., and *L. zebrina*, Menge. Similar larvæ were also found on several species of *Theridion*, some others of *Linyphia*, and on some Epeirids.

——. On some new Species of *Araneidea*, with characters of a new Genus. Ann. N. H. (5) ix. pp. 258–262, pl. xiii.

Characterizes a new European genus of *Theridiidæ* (*Auletta*); describes 3 new species of that family, and renames a species of *Linyphia*.

——. On new and rare Spiders found in Dorsetshire. P. Dorset Club, iv. pp. 147–153.

Contains remarks on the coming to maturity of the male of *Philodromus elegans*, Bl., and gives a list with notes of 9 species new to Dorset, and of 13 others (of various families) of rare occurrence.

——. Notes on British Spiders, with descriptions of three new Species, and characters of a new Genus. Ann. N. H. (5) ix. pp. 1–13, pl. i.

Contains records or descriptions of 22 species of *Araneidea* of various families, and characterizes a new genus of *Dictynidæ* (*Amphissa*).

Campbell, F. M. On a probable case of Parthenogenesis in the House Spider (*Tegenaria gayoni*, Guér.). J. L. S. xvi. pp. 536–539.

Details the circumstances which led to the belief that parthenogenesis occurred in the instance noted.

——. Tr. Hertford. Soc. ii. pp. 141 & 142. Remarks on the best method of searching for and capturing Spiders; and describes the nest of *Atypus*, and the situation in which to find it.

Emerton, J. H. New England Spiders of the family *Theridiidæ*. Tr. Conn. Ac. vi. pp. 1–86, pls. i.–xxiv.

Describes 134 species (85 new) from various parts of North America, mostly from Eastern Massachusetts. Lists are given of the species (21) described by Hentz, also of those (22 in number) considered to be identical with European species, and of those described by O. P. Cambridge (24) in P. Z. S. 1874–75, as well as of some others (11) worked out by Keyserling. Six new genera are characterized.

Fairmaire, M. L. [and others]. Bull. Soc. Ent. Fr. (6) i. p. xciii. On the subject of "Spider silk" obtained from a Cape of Good Hope Spider. The failure of all efforts yet made to make it an article of commerce is noted, and the fruitless experiments of Raymondo Maria de Nemayer in Italy, in 1777-78, of President Bon, in 1710, of D. Rolt, with large American Spiders, and of Dubois, are mentioned.

Fitch, Edward A. External Parasites of Spiders. Ent. xv. pp. 169–175, woodcuts.

Reviews the literature on the subject. The parasites (*Ichneumonidæ*) were found on *Epeiridæ* and *Theridiidæ*.

Hansen, H. J. Sur les dessins d'Aranéides Danoises données dans l'ouvrage illustré "Zoologica Danica" publié par M. le Prof. Schiödte avec une subvention de l'État de Danemark. Ent. Tidskr. i. pp. 169 & 170.

A selection was exhibited of drawings of Danish Spiders, executed by M. Hansen, on an elaborate plan, for the fullest illustration of the Spider in respect to its sex, structure, and other peculiarities. The publication of the drawings is intended for fasc. 3, Zool. Dan. (*Cf.* Zool. Rec. xviii. *Arachn.* p. 7.)

Holmberg, E. L. Observations à propos du Sous-ordre des Araignées Territelaires (Territelariæ), specialement du genre Nord-Americain *Cataleyna*, Hentz, et de la nouvelle famille *Mecicobothrioidæ*, Holmb. Bol. Ac. Arg. iv. pp. 153–174, pl. i.

Discusses fully the position of *Cataleyna*, Hentz, and comes to the conclusion that it is identical with *Zora*, and not a Theraphosid at all, its position among the latter being based on incorrect observation. A new genus *Mecicobothrium* is characterized and placed in a new family [which is probably no more than a sub-family of *Theraphosidæ*].

Hasselt, A. W. M. van. *Araneæ* in P. J. Veth's "Midden-Sumatra" iv. 3de Aflev. Naturlijke Historie, Part 11A, pp. 1–56, pls. i.–v. Leiden: 1882, roy. 8vo.

The author reviews the work already done by various writers in describing and recording Spiders from the Malay Archipelago, and gives a systematic list, with short descriptions, of 106 species (28 new), belonging to different families and genera of *Araneidea* from Sumatra. The new species are figured.

Howlett, W. F. Clasping organs in Male Spiders and Mites. N. Z. J. Sci. i. p. 213.

The great development of the tibiæ and metatarsi of the first pair of legs in the male of *Macrothele huttoni*, Cambr., is supposed to be for the purpose of clasping the female. A similar structure was noted in an Acarid. This development is supposed not to have been noticed before in respect to Spiders and Acarids. [Excessive development of the anterior legs of some other Spiders and Acarids is well known, but no special function has yet been proved to belong to it.]

F. Karsch notes a fossil species of *Araneæ* from Silesia, found in the coal formation; Z. geol. Ges. 1882, p. 556.

Keyserling, Eugen von. Neue Spinnen aus Amerika. III. Verh. z.-b. Wien, xxxi. pp. 269–314, pl. xi.

Describes 31 species (all new) from North and South America, of *Epeiridæ*, *Uloboridæ*, *Dictynidæ* (*Amaurobiinæ*), *Agelenidæ*, *Drassidæ*, *Dysderidæ*, and *Thomisidæ*; and characterizes three new genera of *Epeiridæ* and *Drassidæ*.

Koch, Ludwig. Die Arachniden Australiens nach der Natur beschrieben und abgebildet. Parts xxix. & xxx. pp. 1325–1372, pls. cxiii.–cxvi. Nürnberg: 1882.

In continuation of the work [*cf.* Zool. Rec. xviii. *Arachn.* p. 3]. Describes and figures 37 species of *Salticidæ*, 33 being new; 12 new genera are characterized.

Kulczynski, V. Wykaz Pajaków z Tatr, Babiéj góry i Karpat szlazkich z uwzglednieniem pionowego rozsiedlenia Pajaków zyjacych w Galicyi zachodniéj. Osobne odbicie ze Sprawozd. kom. fizyogr. xv. pp. 248–322 [1881].

In this paper, out of 412 species, about 25 are recorded as new to science; these last are, however, all described and figured subsequently as [redacted] species in "Opisy Nowych Gatunkow Pajaków," &c. (*infrà*).

[redacted]nnen aus der Tatra und den westlichen Beskiden. Krakau: [redacted] pp. 1–34.

This paper is for the most part a reprint in German of the paper last quoted; it refers to Spiders found in the Silesian western Carpathians, and recorded by C. Fickert (Verzeichniss der Schlesischen Spinnen, Z. E. Ver. schles. 1876), and gives a list of those recorded from the Tatra by Nowicki, L. Wajgiel, L. Koch, V. Kulczynski, and O. Hermann in 1867–79. The Spiders recorded in the present paper are 228, all of known

species, comprised in 11 families and 66 genera. The species described as new in Kulczynski's work above quoted are included among these. 19 other genera are also represented among 64 found in the plains and hilly district.

——. Opisy nowych Gatunkow Pajaków, z Tatra, Babiéj góry i karpa szlazkich przez. Wladyslawa Kulczyzynskiego (Araneæ novæ in Montibus Tatricis, Babia Góra, Carpatis Silesiæ collectæ, descriptæ a Vlad. Kulczynski). Osobne odbicæ z Pamietnika Akademii umiejetnósci w. Krakowie Wydzial matematyczo-przyrodniczy, viii. pp. 1–42, pls. i.–iii.

Describes and figures portions of 25 species (23 new) of *Araneidea*, belonging to the *Theridiidæ*, *Agelenidæ*, *Drassidæ*, *Thomisidæ*, and *Dysderidæ*. These have already been described or recorded in the two works by the same author, above quoted.

Lecky, R. J. Spiders' Webs. J. R. Micr. Soc. (2) ii. p. 337.

Referring to Anthony's paper (*suprà*), the author states that in his opinion the viscid globules on the radii of the snares of *Epeiridæ* are bedewed upon the radii at regular intervals after the whole snare is completed. [The latter part of this position seems to be at variance with the observations of others.]

McCook, H. C. Nest Forms of the Furrow-Spider, *Epeira strix*. P. Ac. Philad. 1882, pp. 97-99.

Classifies the different snares and webs spun by Spiders, and details the different forms of web made by *Epeira strix*, which are dependent on the various circumstances of the situation and the accidents of the environment of the snare. [*Cf.* Ann. N. H. (5) x. p. 180, and J. R. Micr. Soc. (2) ii. pp. 613 & 614; also "Our Continent," vol. ii. p. 296, where a somewhat similar classification is given (see *infrà*)].

——. Snares of Orb-weaving Spiders. P. Ac. Philad. 1882, pp. 254–257, figure.

The geometric, or orb-webs, are divided into vertical and horizontal. The former are detailed and classified as the full-orb, sectoral-orb, actinic-orb, and orb-sector; the latter as the plane-orb and domed-orb: each kind is again subdivided. [This is a further development of the popular, but hardly scientific, primary division of a portion of the *Araneidea* according to the forms of snare.]

——. Nesting Habits of Orb-weaving Spiders. "Our Continent." Philadelphia: 1882 8vo, ii. pp. 296–299, woodcuts.

A popular paper, classifying orb-webs, in regard to their stru[illegible] (i.) the snare, for capturing prey; (ii) the enswathment, for e[illegible] it; (iii.) The gossamer, for locomotion; (iv.) the cocoon for [illegible]va; (v.) the nest, for dwelling in. The snares of various species are figured.

——. How Orb-weaving Spiders make their Webs. *Tom. cit.* pp. 361–364.

The mode in which geometric snares are formed is minutely described in a popular manner; it appears to differ in no material respect from

that hitherto observed by others. The mode of entangling their prey, by Spiders, is also detailed.

Rowbotham, F. J. Habits of Spiders. Nature, xxvi. p. 386.

Calls attention to the voluntary quivering and dancing movement so often observed in Spiders in their webs, and concludes that it is due to a desire for concealment on the approach of danger.

Semper, C. Die natürlichen Existenz-bedingungen der Thiere. Internat. wiss. Bibliothek, xxxix. & xl. pp. 299 & 296.

Records a hitherto undescribed Spider, found in holes of coral blocks, where it becomes immersed at each flood.

Simon, Eugène. Études Arachnologiques, 13e Memoire, xx. Descriptions d'espèces et de genres nouveaux de la famille des *Dysderida*. Ann. Soc. Ent. Fr. (6) ii. pp. 201–240, woodcuts.

Describes 40 species (all new) of various genera, of which six are characterized as new, from France, Spain, Egypt, and Syria.

Simon exhibited the gigantic nest of a Spider from the Islands of Solo (New Hebrides Group) ; Bull. Soc. Ent. Fr. (6) i. p. xxxi. [1881]. In form and texture this nest resembled a very large one of *Stegodyphus lineatus*, Latr., found in S. Europe. [The form appears to be that of a cornucopia.] *Cf. l. c.* p. xciii., where Simon, in explanation of the above, said that it had been ascertained to be the work of the natives, who formed it out of silk obtained from the egg-cocoons of *Nephila labillardierii* and other allied species.

The same Arachnologist exhibited nests of two species of *Theraphosidæ*. i. Of *Lasiodora spinicrus*, which reached Paris alive, and had deposited its eggs on the way. The eggs are numerous, not agglutinated, but enveloped in a very white tissue, stout, and of a woolly appearance. ii. Of a Spider belonging to new genus near *Idiops*. The nest is fixed to the bark of a tree ; it is almost cylindrical, rounded and closed at the bottom, and has a very oblique opening at the top, closed by a moveable operculum, slender and thin, but rigid, and attached at its lowest point. The outer side of the nest is covered with fragments of bark and lichens, excepting on the middle of the operculum, which remains smooth and white. Bull. Soc. Ent. Fr. (6) ii. pp. lxix. & lxx.

Sör[illegible] William. Sur le rapprochement des sexes chez quelques [illegible]ées. Ent. Tidskr. i. pp. 171–174.

[illegible]or notes various interesting facts and instances respecting the avi[illegible]among some males and the backwardness of others in seeking the female, and courting her society. He mentions that the adult males of some Spiders may be found at times dwelling along with immature females, which is accounted for by the fear of the male to approach an adult female, who may have already coupled, and may therefore at once massacre him ; he therefore prefers attaching himself to a young female with whom he can dwell, and couple with when mature.

URQUHART, A. T. Protective Resemblances among New Zealand Spiders. N. Z. J. Sci. i. pp. 230 & 231.

The author remarks that "although Spiders are more or less conspicuous when resting on their webs, yet when they occur on foliage, amongst twigs or on rocks or loose earth, there is always a general similarity of coloration between them and their surroundings." Numerous instances are pointed out.

THERAPHOSIDÆ.

BRAUN, M., refers to the habits and feeding on mice of two species of this family in the Zoological Institute of the University of Würzburg. Zool. Gart. xxiii. pp. 376 & 377.

Liphistius desultor, Schiödte, figured and described from Sumatra; the male new to science: Van Hasselt, Midden-Sumatra, iv. pt. 11A, p. 38, pl. iii. figs. 1–3.

Catadysas, Hentz, is a Drassid, not a Theraphosid; E. L. Holmberg, Bol. Ac. Arg. iv. p. 153.

Mecicobothrium, g. n. [appears to be allied to *Macrothele*, Auss.], placed in a new family, *Mecicobothrioidæ*; for *M. thorelli*, sp. n., E. L. Holmberg, *l. c.* p. 162, pl. i., Tandil, south of the province of Buenos Aires. [The structure of the digital joint and palpal organs is peculiar, but this would scarcely necessitate a separate family for its reception.]

Nemesia brauni, sp. n., L. Koch, Verh. z.-b. Wien, xxxi. p. 642, pl. xx. fig. 21, Balearic Isles.

FILISTATIDÆ (= UROCTEOIDÆ).

Filistata puta, Cambr., = *F. testacea*, Latr. [?]; E. Simon, Ann. Mus. Genov. xviii. p. 243.

DYSDERIDÆ.

Dysdera mordax, sp. n., L. Koch, Verh. z.-b. Wien, xxxi. p. 640, pl. xx. fig. 20, Balearic Isles. *D. dentichelis*, p. 207, and *D. spinicrus*, p. 209, Lebanon. *D. leprieuri*, p. 209, Bordj-Menaël, *D. aciculata*, p. 210, Bou-Saada, *D. lucidipes*, p. 211, Géryville, *D. vesciculifera*, p. 212, Biskra, *D. nubila*, p. 213, Corsica, *D. provincialis*, p. 214, Ile de Porquerolles, *D. lantosquensis*, p. 215, Alpes Maritimes, Saint Martin Lant[illegible]e, *D. fervida*, p. 216, Provence and Corsica, *D. cribrata*, p. 217, Haute[illegible]s-, and Maritime Alps, *D. scabricula*, p. 217, Var, Sainte [illegible], *rudis*, p. 218, Var, Hyères, *D. fuscipes*, p. 219, Morbihan, [illegible], Gironde, Arcachon, Portugal, Douro, *D. flavitarsis*, p. 220, [illegible]ye, Galdamés, Pyrenees, Col de Pajares, *D. sanguinipes*, p. 221, Corsica, Bonifacio, Algeria, Egypt, *D. iguaca*, p. 222, Corsica, *D. inaquipes*, p. 222, Corsica and Islands of Lavesi, *D. drassoides*, p. 223, Alps, Pyrenees, and mountains in North Spain, spp. nn.; E. Simon, Ann. Soc. Ent. Fr. (6) ii.

Harpactes crassipalpis, p. 224, Syria, *H. corticalis* and *H. muscicola*,

p. 226, Corsica, *H. modestus*, p. 227, Dijon, Var, Sainte-Baume, Menton, Sospel, Saint Martin Lantosque, *H. hispanus*, p. 228, Eastern Pyrenees, Catalogne, spp. nn., E. Simon, *l. c.*

Dasumia istriaca, sp. n., E. Simon, *l. c.* p. 229, Istria, Castelnuovo.

Tedia, g. n. Closely allied to *Dysdera*, Latr., but differs in the form of the maxillæ, p. 230; for *T. oxygnatha*, sp. n., p. 231, E. Simon, *l. c.*, Syria.

Holissus, g. n. Near *Harpactes*, Templ., but differs in the two parallel rows of long spines beneath the genua, tibiæ and metatarsi of the two first pairs of legs, p. 231; for *H. unciger*, sp. n., p. 232, E. Simon, *l. c.*, Corsica.

Harpasea, g. n. Resembles *Dysdera*, differing in the great length and slenderness of the legs, p. 233; for *H. tenuipes*, sp. n., p. 234, E. Simon, *l. c.*, Corsica.

Rhode, g. n. Differs from *Dysdera*, &c., in the underside of the abdomen being covered with a large chitinous plate, p. 235; for *R. scutiventris*, sp. n., p. 236, Pyrenees, Col de Pajares.

Sulsula, g. n. Allied to *Oonops*, Templ., p. 236, and near *Orchestina*, Sim. (a genus proposed for *Schænobates pavesii*, Sim.), p. 237; for *S. longipes*, sp. n., p. 237, E. Simon, *l. c.*, Ramleh, Egypt.

Oonops procerus, p. 238, Eastern Pyrenees, La Preste, near le Prats-de-Mollo, Conat, near Prades; *O. angustatus*, p. 239, Hérault, Bois de Fondfroide, near Montpellier, Var, Ile de Porquerolles, Corsica, and *O. inermis*, p. 240, Var, Vallée de Dardennes, near Toulouse, spp. nn., E. Simon, l. c. *O. principalis*, p. 296, pl. xi. fig. 16, *O. similis*, p. 297, fig. 17, *O. propinquus*, p. 298, fig. 18, and *O. cupidus*, p. 299, fig. 20, New Granada, *O. machinator*, p. 298, fig. 19, *O. globosus*, p. 301, *O. desultrix*, p. 301, fig. 21, Puma-Maria, Peru, E. von Keyserling, Verh. z.-b. Wien, xxxi. pl. xi.

Leptoneta abeillii, p. 201, Ardèche, New Grotto, near Vallon, Grotto of St. Martin, near St. Marcel; *L. minos*, p. 202, Eastern Pyrenees, Grotto of Villafranche, Conat, La Preste, Aude, Grottoes of Ginoles, As-pradels, Belvis, &c.; *L. alpica*, p. 203, Alpes Maritimes, Sospel, St. Martin Lantosque; *L. olivacea*, p. 204, Var, Trou-des-Fades, near Hyères, Grotto of St. Trou, near Toulon, spp. nn.; E. Simon, *l. c.*

Telema, g. n. Allied to *Leptoneta*, Sim., p. 204; for *T. tenella*, sp. n., Eastern Pyrenees, Grotto Brichot, near La Preste, E. Simon, *l. c.*

Segestria fusca, Aude, La Clape, Eastern Pyrenees, Collioure; *S. pusc[illegible]* Corsica, spp. nn., E. Simon, *l. c.* p. 206. *S. snellemanni*, sp. n., V[illegible]elt, Midden-Sumatra, iv. pt. ii.A, p. 37, Sumatra.

[illegible]*tygia*, sp. n., G. Joseph, B. E. Z. 1882, p. 17, Godjama and Treffen.

[illegible]*hyphantes*, g. n., for *T. polyophthalmus*, sp. n., *id. l. c.* p. 18, Grotto of Corgnale.

Nicthyphantes, g. n., for *N. microphthalmus*, sp. n., *id. l. c.*, hab. cit.

Drassidæ.

Micaria hospes, sp. n., Kulczynski, Pamietnik. Wydz. Akad. Umiej. w.

Krakowie, viii. p. 35, pl. iii. fig. 22, Silesia (*cf.* also *id.* Berichte der physiograph. commission, xv. p. 248 *et seq.*).

Gnaphosa basilicata, sp. n., E. Simon, Bull. Ent. Ital. xiv. p. [illegible], Pollino.

Pythonissa plumalis, Cambr., from Seeik Osman; *P. bicalcarata*, p. 235, fig. 7, Tes, *P. spinigera*, p. 236, figs. 8 & 9, Aden ?, *P. arenicolor*, p. 237, figs. 10 & 11, Aden, *P. arcifera*, p. 238, Tes, spp. nn., E. Simon, Ann. Mus. Genov. xviii. pl. viii.

Drassus parvulus, sp. n., L. Koch, Verh. z.-b. Wien, xxxi. p. 632, pl. xx. figs. 10 & 11, Balearic Isles.

Xeropigo, g. n., for *Olios tridentiger*, Cambr.; O. P. Cambridge, P. Z. S. 1882, p. 424, pl. xxix. fig. 1, St. Helena.

Arachosia, g. n., for *A. anyphænoides*, sp. n., *id. l. c.* p. 426, pl. xxix. fig. 2, Amazons.

Clubiona alpicola, sp. n., p. 33, fig. 20, and *C. frutetorum*, L. Koch, figured and described, p. 34, fig. 21 *a*, *b*, Kulczynski, *l. c.* pl. iii., Silesia.

Prosthesima plumigera, p. 633, *P. flagellans*, p. 635, fig. 14, and *P. semirufa*, p. 636, fig. 15, spp. nn., L. Koch, *l. c.* pl. xx., Balearic Isles.

Anyphæna notata, p. 292, fig. 14, and *A. vittata*, p. 294, fig. 15, spp. nn., Keyserling, Verh. z.-b. Wien, xxxi. pl. xi., Pumamarca, Peru.

Chiracanthium occidentale, sp. n., L. Koch, *l. c.* p. 637, pl. xx. fig. 16, Balearic Isles; *C. yemenense*, sp. n., E. Simon, Ann. Mus. Genov. xviii. p. 240, pl. viii. fig. 16, Tes.

Zora inornata, sp. n., L. Koch, *l. c.* p. 639, pl. xx. fig. 19, Balearic Isles.

Trachelas flavipes, sp. n., *id. l. c.* p. 638, pl. xx. figs. 17 & 18, Balearic Isles.

Agræca striata, sp. n., Kulczynski, *l. c.* p. 31, pl. iii. fig. 19, Silesia.

Liocranoides, g. n. Closely allied to *Liocranum*, p. 290; for *L. unicolor*, sp. n., p. 291, Keyserling, *l. c.*, Mammoth Cave, Kentucky.

Zimiris, g. n., p. 239. Resembles in some respects *Miltia*, Sim., and *Enyo*, id., but still nearer *Megamyrmecion*, Wid.; for *Z. doriæ*, sp. n., p. 240. E. Simon, Ann. Mus. Genov. xviii., Aden.

Megamyrmecion, Wid., = *Dictyon*, Walck.; re-characterized from Egypt, p. 257. *M. holosericeum*, sp. n., p. 257, pl. viii. figs. 21 & 22, Assuan; E. Simon, *l. c.*

Palpimanidæ.

Palpimanus gibbulus, Duf., from Aden; E. Simon, *l. c.* p. 228.

Eresidæ.

Stegodyphus molitor, C. L. Koch, described from Aden; E. [illegible], *l. c.* p. 230.

Dictynidæ.

Dictyna volupis, p. 285, fig. 10, and *D. volucripes*, p. 286, fig. 11, spp. nn.; Keyserling, Verh. z.-b. Wien, xxxi. pl. xi., Massachusetts.

Amphissa, g. n., p. 2. Allied to *Lethia*, Menge ; for *Lethia spinigera*, Cambr., p. 3, pl. i. fig. 1 : O. P. Cambridge, Ann. N. H. (5) ix., Hodsdon, Hertfordshire.

Enyoidæ (*Zodariidæ*).

Storena melanogaster, sp. n., Van Hasselt, Midden-Sumatra, iv. pt. ii.A, p. 34, pls. ii. fig. 6, v. figs. 1 & 2, Sumatra.

Trygetus, g. n. Allied to *Palæstina*, Cambr. ; for *Palæstina sexoculata*, Cambr. : E. Simon, *l. c.* p. 229. *T. nitidissimus*, sp. n., *id. l. c.* p. 229, Aden.

Agelenidæ.

Cybæus signatus, sp. n., Keyserling, *l. c.* p. 287, pl. xi. fig. 12, Maragnce, Peru.

Calotes juvenilis, sp. n., *id. l. c.* p. 228, pl. xi. fig. 13, Mammoth Cave, Kentucky.

Hahnia parva, sp. n., Kulczynski, *l. c.* p. 30, pl. iii. fig. 18, Silesia.

Hersiliidæ (*alinuridæ*, L. K.).

Hersilia caudata, Sav., var. *diversa*, Cambr. ; E. Simon, *l. c.* p. 227, Tes.

Hersilia, Sav., = *Chalinura*, Dalman, and the former name has probably the priority ; E. Simon, *l. c.* p. 254.

Murricia, g. n., for *Hersilia indica*, Luc. ; *id. l. c.* p. 255.

Rhadine, g. n., = *Chalinura*, L. Koch, for *Hersilia novæ-hollandiæ*, L. Koch, and *H. fickerti* ; id. *l. c.* p. 255.

Tama, g. n., for *Hersilia edwardsi*, Luc. ; *id. l. c.* p. 256.

Scytodidæ.

Scytodes delicatula, E. Sim., Aden, and *S. univittata*, sp. n., Tes, E. Simon, *l. c.* p. 242.

Pholcidæ.

Pholcus borbonicus, Vins., from Seeik Osman ; E. Simon, *l. c.* p. 234.

Theridiidæ.

Ar[illegible]anes setipes, sp. n., Van Hasselt, *l. c.* p. 31, pl. iv. fig. 15, Sumatra. *T[illegible]ion longipes* and *T. plumipes*, p. 33, *T. argentinum*, p. 34, pl. ii. [illegible]p. nn., *id. l. c.*, Sumatra. *T. climatum*, p. 630, fig. 8, and [illegible]*tum*, p. 631, fig. 9, L. Koch, Verh. z.-b. Wien, xxxi. pl. xx., [illegible] Isles. *T. differens*, p. 9, fig., and *T. spirale*, p. 10, fig. 2, various localities in North America, *T. montanum*, p. 10, fig. 3, White Mountains, *T. zelotypum*, p. 11, fig. 4, Eastport and Portland, *T. murarium*, p. 11, fig. 5, various localities, *T. puncto-sparsum*, p. 12, fig. 6, Salem, Boston, and Newhaven, Conn., pl. i. ; *T. rupicola*, p. 14, fig. 2, Eastern Massachusetts and Newhaven, Conn., *T. sexpunctatum*, p. 12, fig. 5, Anticosti, and Mount Washington, *T. immaculatum*, p. 15, fig. 4, Eastern

Massachusetts and Newhaven, Conn., spp. nn., pl. ii.; J. H. Emerton, Tr. Conn. Ac. vi.

Coleosoma, g. n., for *C. blandum*, sp. n., O. P. Cambridge, P. Z. S. 1882, p. 427, pl. xxix. fig. 3, Ceylon.

Thwaitesia pulcherrima, sp. n., A. G. Butler, P. Z. S. 1882, p. 764, pl. lvii. figs. 7, 7*a*, & 7*b*, Madagascar. *T.*? *diversa*, p. 432, fig. 8, and *T. affinis*, p. 431, fig. 8*a*, Amazons, spp. nn., O. P. Cambridge, *l. c.* pl. xxxi.

Chrysso, g. n., for *C. albo-maculata*, p. 429, fig. 6, Amazons, and *C.*? *quadrata*, p. 430, fig. 7, Ceylon, spp. nn., O. P. Cambridge, *l. c.* pl. xxx. *C. cordiformis*, p. 763, fig. 2, and *C. nivipictus*, p. 764, figs. 1 & 1*a*, spp. nn., A. G. Butler, *l. c.* pl. lvii., Madagascar.

Archæa, g. n., for *A. insignis*, sp. n., O. P. Cambridge, *l. c.* p. 428, pl. xxx. fig. 5, Amazons.

Sphecozone nigra, sp. n., *id. l. c.* p. 428, pl. xxix. fig. 4, Amazons.

Asagena americana, sp. n., J. H. Emerton, Tr. Conn. Ac. vi. p. 23, pl. iv. fig. 6, various localities in N. America.

Steatoda nigra, sp. n., *id. l. c.* p. 21, pl. iv. fig. 4.

Theridula, g. n., for *Theridion sphærula*, Hentz, *id. l. c.* p. 25, pl. v. fig. 3.

Euryopis argentea, sp. n., *id. l. c.* p. 27, pl. v. fig. 5, Beverley and Milton, Mass., and Newhaven, Conn.

Pholcomma hirsutum, p. 29, fig. 6, Mount Carmel, Hamden, Conn., and Newhaven, *P. rostratum*, p. 30, fig. 5, Waltham and Watertown, Mass., spp. nn., pl. vi., *id. l. c.*

Ceratinella, g. n., = *Ceratina*, Menge, for *C. bulbosa*, p. 33, fig. 3, *C. pygmæa*, p. 34, fig. 4, Newhaven, Conn., pl. vii., *C. brunnea*, fig. 3, various localities, *C. minuta*, fig. 4, Newhaven, Conn., and West Quincey, Mass., *C. micropalpis*, p. 36, fig. 5, West Quincey, Mass., pl. viii., spp. nn., *id. l. c.*

Ceratinopsis, g. n., p. 36, for *Erigone interpres*, Cambr., *C. nigriceps*, fig. 2, Newhaven, Conn., and Dedham, Mass., *C. laticeps*, fig. 3, Danvers, Mass., and Newhaven, Conn., *C. nigripalpis*, p. 38, fig. 4, Newhaven, Conn., spp. nn., pl. ix., *id. l. c.*

Grammonota, g. n., for *Erigone pictilis* and *ornata*, Cambr., p. 3, and *G. inornata*, sp. n., p. 39, pl. x. fig. 5, *id. l. c.*, Sangus, Mass., Newhaven, Conn., and Wood's Hole, Mass.

Spiropalpus, g. n., for *S. spiralis*, sp. n., *id. l. c.* p. 39, pl. x. fig. 6, Danvers, &c., Mass., and Newhaven, Conn.

Cornicularia (*Walckenaera*, Bl., pt.) *tibialis*, fig. 2, Mount Tom, Holyoke, Mass., *C. communis*, fig. 3, various localities, p. 41, *C. [illegible]cornis*, fig. 5, Pine Rock, Newhaven, Conn., *C. minuta*, fig. [illegible] localities, *C. pallida*, fig. 7, Newhaven, Conn., p. 42, *C. tricor[illegible]* Mount Washington, New Hampshire, pl. xi., *C. auranticeps*, [illegible] Mass., and White Mountains, N. H., *C. clavicornis*, fig. 7, Mount [illegible]ington, N. H., p. 43, pl. viii. spp. nn., J. H. Emerton, Tr. Conn. Ac. vi.

Lophomma (*Walckenaera*, Bl., pt.) *elongata*, sp. n., *id. l. c.* p. 44, pl. x. fig. 2, Salem, Boston, and Mount Tom, Mass.

Lophocarenum (*Walckenaera*, Bl., pt.) *castaneum*, fig. 1, Beverly, Swampscot, and Milton, Mass., *L. montanum*, fig. 2, p. 45, *L. decem-oculatum*, p. 46, fig. 4, Mount Washington, pl. xii., *L. montiferum*, p. 47, fig. 2,

Brookline and Salem, Mass., *L. quadricristatum*, fig. 3, Mount Washington, N. H., *L. longitarsis*, fig. 4, *L. pallidum*, fig. 5, White Mountains, near Mount Washington, p. 48, *L. longitubus*, fig. 6, Mount Washington, N. H., pl. xiii., *L. rostratum*, fig. 1, Newhaven, Conn., *L. scopuliferum*, fig. 2, p. 49, Cambridge, Waltham, and Roxbury, Mass., *L. erigonoides*, fig. 3, Beverly, Mass., *L. latum*, fig. 4, Watertown, Mass., *L. simplex*, fig. 5, Salem, Mass., *L. depressum*, fig. 6, Mount Washington, N. H., p. 50, *L. crenatum*, fig. 7, Beverly, Mass., and Newhaven, Conn., *L. vernale*, fig. 8, Pine Rock, Newhaven, Conn., p. 51, pl. xiv., spp. nn., J. H. Emerton, Tr. Conn. Ac. vi.

Tmeticus (*Neriene*, Bl., pt.) *tridentatus*, fig. 2, Providence, R. I., and Newhaven, Conn., *T. plumosus*, fig. 3, Montreal, Mount Washington, N. H., and Beverly, Mass., *T. trilobatus*, fig. 4, Cambridge, Mass., and Newhaven, Conn., p. 53, *T. contortus*, fig. 5, Cambridge and Waltham, Mass., pl. xv., *T. longisetosus*, fig. 1, Newhaven, Conn., p. 54, *T. montanus*, fig. 3, Mount Washington, N. H., *T. pallidus*, fig. 4, Newhaven, Conn., *T. maximus*, fig. 5, Mount Washington, N. H., p. 55, *T. tibialis*, fig. 6, Mount Washington, N. H., pl. xvi., *T. bostoniensis*, fig. 1, Boston, Mass., *T. bidentatus*, fig. 2, Mount Washington, N. H., p. 56, *T. concavus*, fig. 3, near Boston, Mass., and Pine Swamp, Newhaven, Conn., *T. microtarsus*, fig. 4, *T. truncatus*, fig. 5, Mount Washington, N. H., *T. terrestris*, fig. 6, Mount Tom, Holyoke, and Salem, Mass., p. 57, *T. brunneus*, p. 58, fig. 7, Mount Washington, N. H., pl. xvii., spp. nn., J. H. Emerton, Tr. Conn. Ac. vi.; *T.* (*Erigone*) *pertinens*, Cambr., described and figured from N. America, *id. l. c.* p. 54, pl. xvi. fig. 2.

Erigone, Sav. (stricto sensu, = *Neriene*, Bl., pt.) *autumnalis*, sp. n., *id. l. c.* p. 58, pl. xvii. fig. 8, Boston, Mass., and Newhaven, Conn. *E. longipalpis*: under this name several species are included (viz., *E. dentigera*, Cambr., and others) as incapable of satisfactory separation from each other, but their distinctions are mentioned and discussed; *id. l. c.* p. 59, pl. xvii. figs. 9 & 10.

Walckenaera penultima, p. 7, fig. 4, *W. mitis*, p. 8, fig. 6, and *W. miser*, p. 9, fig. 7, spp. nn., O. P. Cambridge, Ann. N. H. (5) ix. pl. i., Bloxworth, England. *W. melanocephala*, Cambr., figured; *id. l. c.* pl. i., fig. 5. *W. ante-penultima*, p. 259, fig. 3, and *W. orbiculata*, p. 260, fig. 2, spp. nn., O. P. Cambridge, *l. c.* pl. xiii., Nuremberg.

Erigone (including *Neriene* and *Walckenaera*, Bl.) *cacuminum*, p. 13, fig. 8, *E. myrmicarum*, p. 15, fig. 9, pl. i., *E. carpatica*, p. 16, fig. 10, *E. arie*[illegible]17, fig. 11, *E. longa*, p. 19, fig. 12, *E. gibbifera*, p. 21, fig. 13, *E.* [illegible]*ta*, p. 23, fig. 14, *E. decipiens*, p. 24, fig. 15 [*Walckenaera melanocephala*, Cambr.], *E. suspecta*, p. 26, fig. 16, pl. ii., *E. tatrica*, p. 28, [illegible]. iii. spp. nn., Kulczynski, *l. c.*, Silesia; *E. marina*, sp. n., L. K[illegible]erh. z.-b. Wien, xxxi. p. 629, pl. xx. fig. 7, Balearic Isles.

Neriene lapidicola, Thor., differentiated from *N. formidabilis*, Cambr., p. 6; *N. agrestis*, Bl., p. 4, and *N. fusca*, id. p. 5, differentiated from each other: O. P. Cambridge, Ann. N. H. (5) ix. pl. i. figs. 2*a* & 2*b*.

Auletta, g. n. Closely allied to *Neriene*, Bl.; for *A. excavata*, sp. n., *id. l. c.* p. 258, pl. xiii. fig. 1, Nuremberg.

Linyphia mandibulata, sp. n., J. H. Emerton, *l. c.* p. 64, pl. xix. fig. 2,

various localities, N. America; *L. annulata*, p. 2, fig. 1, *L. pulchra*, p. 4, fig. 2, *L. varians*, p. 6, fig. 3, *L. monticola*, p. 7, fig. 4, *L. arcigera*, p. 9, fig. 5, *L. torrentum*, p. 10, fig. 6, spp. nn., Vladimir Kulczynski, *l. c.* pl. i., Silesia. *L. microphthalma*, Cambr., described and figured from Silesia; *id. l. c.* p. 11, pl. i., fig. 7. *L. misera*, sp. n., England, name changed from *L. turbatrix*, Cambr., preoccupied; O. P. Cambridge, Ann. N. H. (5) ix. p. 262.

Diplostyla, g. n., for *Linyphia nigrina*, Westr., and *L. concolor*, Wid., p. 65; *D. canadensis*, sp. n., p. 66, pl. xxi. fig. 1, Montreal, J. H. Emerton, *l. c.*

Bathyphantes zebra, p. 69, fig. 2, E. Mass., and Newhaven, Conn., *B. subalpina*, fig. 3, Mount Adams, White Mountains, N. H., *B. alpina*, fig. 4, p. 70, Mount Washington, N. H., *B. angulata*, fig. 5, various localities, *B. formica*, fig. 7, *B. micaria*, fig. 6, p. 71, Newhaven, Conn., pl. xxii., *B. complicata*, pl. xxiv. fig. 8, *B. bihamata*, pl. xxiii. fig. 4, Mount Washington, N. H, p. 72, spp. nn., J. H. Emerton, *l. c.*

Bolyphantes drassoides, sp. n., *id. l. c.* p. 72, pl. xxiii. fig. 5, Mount Carmel, Hamden, Conn.

Microneta discolor, fig. 1, Waltham, Mass., and Newhaven, Conn., *M. quinque-dentata*, fig. 2, Montreal, Mount Washington, N. H., and various localities, Mass., *M. crassimanus*, fig. 3, Hermit Lake, Mount Washington, N. H., p. 75, *M. latidens*, fig. 4, Newhaven, Conn, *M. furcata*, fig. 5, White Mountains, N. H., *M. longibulbis*, fig. 6, Milton, Mass., p. 76, *M. olivacea*, fig. 7, Mount Washington, N. H, p. 77, pl. xxiv., J. H. Emerton, *l. c.*

Mimetus epeiroides, sp. n., *id. l. c.* p. 17, pl. iii. fig. 4, various localities, N. America.

Pachygnatha vethi, sp. n., Van Hasselt, *l. c.* p. 32, Sumatra.

Phoroncidiidæ.

Phoroncidia acrosomoides, sp. n., Van Hasselt, *l. c.* p. 30, pl. i. fig. 7, and pl. iv. figs. 2 & 3. *P. aurata*, Cambr., figured and described from Madagascar; A. G. Butler, P. Z. S. 1882, p. 766, pl. lvii. figs. 4 & 4*a*.

Tecmessa, g. n. Allied to *Phoroncidia*, Westw.: for *T. pectorosa*; O. P. Cambridge, *l. c.* p. 434, pl. xxxi. fig. 10, Amazons.

Ulesanis americana, sp. n., J. H. Emerton, Tr. Conn. Ac. vi. p. 28, pl. vi. fig. 1, Beverly and Danvers, Mass., and Newhaven, Conn.

Ogulnius, g. n. Allied to *Stegosoma*, Cambr.; for *O. obtectu* n., O. P. Cambridge, P. Z. S. 1882, p. 433, pl. xxx. fig. 9, Amazons.

Epeiridæ.

Meta splendida, sp. n., A. G. Butler, P. Z. S. 1882, p. 765, pl. lvii. figs. 3, 3*a* & 3*b*, Madagascar; *M. schaufussi*, sp. n., L. Koch, Verh. z.-b. Wien, 1881, p. 628, pl. xx. figs. 3–6, Balearic Isles; *M. gemmea*, sp. n., Van Hasselt, *l. c.* p. 26, pl. ii. fig. 4, Sumatra; *M. lepida*, p. 273, fig. 3, and *M. longipes*, p. 274, fig. 4, spp. nn., Keyserling, Verh. z.-b. Wien, xxxi. pl. xi., Pumamarca, Peru.

Tetragnatha flagellans, sp. n., Van Hasselt, *l. c.* p. 27, pl. iv. fig. 11, Sumatra.

Cyrtognatha, g. n. Allied to *Tetragnatha* and *Eugnatha*; for *C. nigro-vittata*, sp. n., Keyserling, *l. c.* p. 276, pl. xi. fig. 5, Puma Maria, Peru.

Nephila urna, sp. n., Van Hasselt, *l. c.* p. 28, pl. iv. figs. 12-15, Sumatra.

Cyrtophora citricola, Forsk., = *Epeira opuntiæ*, auctt.; E. Simon, Ann. Mus. Genov. xviii. p. 230, Sceik Osman.

Argiope lordi, Cambr., from Aden, Port Said, Nubia, and Abyssinia; *id. l. c.* p. 207.

Cyclosa propinqua, sp. n., *id. l. c.* p. 230, Sceik Osman.

Singa nigro-fasciata, sp. n., L. Koch, Verh. z.-b. Wien, xxxi. p. 627, pl. xx. fig. 2, Balearic Isles.

Azilia, g. n. Allied to *Zilla*, from which the widely separated lateral eyes distinguish it; for *A. formosa*, sp. n. Keyserling, *l. c.* p. 271, pl. xi. fig. 2, Chorillos, Peru.

Epeira nautica, L. Koch, from Aden, *E. subacalypha*, sp. n., Sceik Osman, E. Simon, Ann. Mus. Genov. xviii. p. 232; *E. picto-thorax*, sp. n., p. 20, pl. iv. fig. 4, *stigmatisata*, Karsch, pls. ii. fig. 1, & iv. fig. 5, *hexa-gona*, p. 23, *singaformis*[*singif-*], p. 23, pl. ii. fig. 2, spp. nn., *porcula*, Sim., pl. iv. fig. 6, Van Hasselt, *l. c.*, Sumatra; *E. minula*, sp. n., L. Koch, Verh. z.-b. Wien, xxxi. p. 625, pl. xx. fig. 1, Balearic Isles; *E. strix*, McCook, variation in its nest form, H. C. McCook, P. Ac. Philad. 1882, p. 97.

Pronous chelifer, sp. n., Van Hasselt, *l. c.* p. 27, pl. iv. fig. 11, Sumatra.

Larinia flavescens, sp. n., E. Simon, *l. c.* p. 233, Tes.

Gasteracanthidæ.

Gasteracantha (*Isacantha*, Sim.) *picto-spina*, sp. n., Van Hasselt, *l. c.* p. 14, pl. i. figs. 1 & 2, Sumatra; *G. cowani*, sp. n., A. G. Butler, P. Z. S. 1882, p. 766, pl. lvii. figs. 5 & 5*a*, Madagascar.

Paraplectana nigro-analis, sp. n., Van Hasselt, *l. c.* p. 15, pl. i. fig. 3, Sumatra.

Cyrtarachne nigro-humeralis, sp. n., p. 17, pl. i. fig. 6; *C. perspicillaris*, Dol., figured, pl. i. figs. 4 & 5: Van Hasselt, *l. c.*, Sumatra.

Cerostris extensa, p. 100, fig. 3, *retorta*, p. 101, fig. 6, *ecclesiigera*, p. 102, figs. 1, 1*c* & 2, 2*c*, *cowani*, p. 103, fig. 4, *excellens*, p. 105, fig. 5, A. G. Butler, Ann. N. H. (5) x. pl. vi. Madagascar.

Uloboridæ.

Uloborus velutinus, sp. n., A. G. Butler, P. Z. S. 1882, p. 767, pl. lvii. figs. 6, 6*a* & 6*b*, Madagascar; *U. villosus*, p. 278, fig. 6, Sta. Fé de Bogota (and ? Amable Maria, Peru), *vittatus*, p. 279, Amable Maria and Junin, Peru, *bituberculatus*, p. 282, fig. 8, Pumamaria, Montana di Narsteo, Peru, *peruanus*, p. 283, fig. 9, Amable Maria, Peru, spp. nn., Keyserling, Verh. z.-b. Wien, xxxi. pl. xi.

Miagrammopidæ.

Miagrammopes trailli, p. 435, fig. 11, Amazons, *longicauda*, p. 436, fig. 12, *brevicauda*, p. 437, fig. 12A, Caffraria, spp. nn., O. P. Cambridge, P. Z. S. 1882, pl. xxxi.

Poltidæ.

Wixia, g. n., allied to *Poltys*, C. L. K., for *W. abdominalis*, sp. n.; O. P. Cambridge, *l. c.* p. 438, pl. xxxi. fig. 13, Amazons.

Thomisidæ.

Thomisus arabicus, sp. n., E. Simon, Ann. Mus. Genov. xviii. p. 225, pl. viii. fig. 5, Aden; *T. bigibbosus*, sp. n., Keyserling, *l. c.* p. 309, pl. xi. fig. 27, New Hampshire, U. S. A.

Synema diana, Sav., Aden; E. Simon, *l. c.* p. 207.

Misumena importuna, sp. n., Keyserling, *l. c.* p. 307, pl. xi. fig. 7, San Mateo, California.

Diæa graphica, sp. n., Simon, *l. c.* p. 224, Aden.

Runcinia similis, sp. n., Keyserling, *l. c.* p. 308, pl. xi. fig. 26, Santos, Brazil.

Xysticus alpicola, sp. n., Kulczynski, *l. c.* p. 36, pl. iii. fig. 23, Silesia; *X. baleatus*, E. Sim., L. Koch, Verh. z.-b. Wien, xxxi. p. 646; *X. vernilis*, p. 304, fig. 23, Utah, *X. feroculus*, p. 305, fig. 24, Massachusetts, Keyserling, *l. c.* pl. xi., spp. nn.

Oxyptila furcula, sp. n., L. Koch, *l. c.* p. 648, pl. xxi. fig. 23, Balearic Isles; *O. obsoleta*, sp. n., Kulczynski, *l. c.* p. 38, pl. iii. fig. 24, Silesia.

Platythomisus octo-maculatus, C. L. Koch, described and figured, p. 42, pls. v. figs. 7 & 8, & iii. fig. 4; *P. quadrimaculatus*, p. 42, figs. 5 & 6, *P. striatipes*, p. 43, figs. 7 & 8, Van Hasselt, *l. c.* pl. iii., Sumatra.

Selenops insularis, sp. n., Keyserling, *l. c.* p. 311, pl. xi. fig. 28, Porto Rico, West Indies; *S. ægyptica*, Sav., with various synonyms, E. Simon, Ann. Mus. Genov. xviii. p. 233, Aden.

Themeropis orichalcea, Sim., described and figured, p. 40, figs. 3 & 5; *T. paripes*, Karsch, figured, fig. 6, Van Hasselt, *l. c.*, Sumatra.

Philodromus lentiginosus, sp. n., Keyserling, *l. c.* p. 312, pl. xi. fig. 29, Lake Superior; *P. tegetus*, sp. n., L. Koch, Verh. z.-b. Wien, xxxi. p. 645, pl. xx. fig. 22, Balearic Isles; *P. elegans*, Bl., time of the male coming to maturity, O. P. Cambridge, P. Dorset. Club, iv. p. 147.

Thanatus simplicipalpis, sp. n., E. Simon, *l. c.* p. 226, pl. [illegible], Sceik Osman, near Aden.

Lycosidæ.

Isoctenus bicolor, sp. n., E. van Beneden, Bull. Ac. Belg. (2) xlix. [1880] p. 657, Belgium, probably imported from Brazil with plants.

Caloctenus major, Keys., figured from Sumatra; Van Hasselt, *l. c.* pl. v. fig. 13.

Leptocteuus valvularis, sp. n., p. 45, pl. v. fig. 12, and *L.* ···—, sp. incerta, p. 46, *id. l. c.*, Sumatra.

Dolomedes spathularius, sp. n., *id. l. c.* p. 44, pl. v. figs. 10 & 11.

Lycosa (*Trochosa*) *manicata*, Thor., figured from Sumatra ; Van Hasselt, *l. c.* pl. v. fig. 14. *L. venatrix*, Luc., = *L. fidelis*, Cambr., and *L. galerita*, L. Koch, p. 219; *L. mendicans*, p. 219, Tes, *L. hypocrita*, p. 220, pl. viii. fig. 3, Aden, Sceik Osman, *L. timida*, p. 221, pl. viii. fig. 4, Tes, spp. nn., E. Simon, Ann. Mus. Genov. xviii. *L. subhirsuta*, p. 653, figs. 28 & 29, *L. subterranea*, p. 656, figs. 30 & 31, *L. perspicax*, p. 658, fig. 32, *L. misella*, p. 660, *L. conspersa*, p. 661, fig. 33, *L. simplex*, p. 663, fig. 34, *L. fraissii*, p. 666, fig. 36, *L. insulana*, p. 664, fig. 35, spp. nn., L. Koch, Verh. z.-b. Wien, xxxi. pl. xxi., Balearic Islands.

Pardosa tenuipes, p. 649, fig. 24, *P. venatica*, p. 650, figs. 25–27, spp. nn., L. Koch, *l. c.* pl. xxi., Balearic Isles.

Pseudophthalmus, g. n. Allied to *Tr*···*a*, for *P. schmidti*, sp. n., G. Joseph, B. E. Z. 1882, p. 19, C···· near Neverk···

Evippa, g. n., for *Lycosa vo*···*gulata*, Cambr., E. Simon, *l. c.* p. 222, Sceik Osman, and generally distributed throughout Upper Egypt.

Diapontia gracilis, sp. n., Keyserling, Verh. z.-b. Wien, xxxi. p. 302, ···2, Amable Maria, Peru.

Oxyopidæ.

Peucetia (*Pasithea*, Bl.) *arabica*, sp. n., E. Simon, *l. c.* p. 216, Aden.

Salticidæ.

[N.B. The arrangement in this family is not intended to be systematic.]

Salticus tristis, sp. n., E. Simon, *l. c.* p. 212, Aden.

Menemerus balteatus, sp. n., *id. ibid.*, Aden.

Thya imperialis, Rossi ; *id. l. c.* p. 213, Aden.

Hasarius paykulli, Sav., from Aden, Sceik Osman, and Tes; *id. ibid.*

Phlegra bresnieri ?, Luc., from Aden, *id.* ibid. ; *P. simoni*, sp. n. L. Koch, Verh. z.-b. Wien, xxxi. p. 697, pl. xxi. figs. 37 & 38, Balearic Isles.

Hyroceatum insignipalpe, sp. n., E. Simon, *l. c.* p. 214, Aden. *H. pilo-*···*01*, pl. cxviii. fig. 8, Bowen, *H. flavipes*, p. 1403, fig. 1, *H. bitani-*···*1405*, fig. 2, *H. albo-vittatum*, p. 1407, fig. 3, Peak Downs, *H.* ··· p. 1409, figs. 4, 5, & 6 *c*, Rockhampton, Sydney, N. S. W., *H.* ···*ris*, p. 1412, figs. 6, 6 *a*, & 6 *b*, spp. nn., Sydney, L. Koch, Die ··· Austr. pl. cxix.

···*s*, g. n. Near *Ælurops*, Thor., for *M. fulvo-vittatus*, sp. n., E. Simon, *l. c.* p. 215, pl. viii. fig. 2, Aden.

Mago, g. n., for *M. intenta*, sp. n., O. P. Cambridge, P. Z. S. 1882, p. 439, pl. xxxi. fig. 14, Amazons.

Attus atricapillus, sp. n., E. Simon, Bull. Ent. Ital. xiv. p. 31, Pollino. *A. erraticus*, Walck., observations on cocoon of ; H. Lucas, Bull. Soc. Ent. Fr. (6) ii. pp. lxxxi. & lxxxii.

Homalattus, sp. ?, Van Hasselt, *l. c.* p. 53, Sumatra.

Plexippus samio, Thor., figured from Sumatra; *id. l. c.* pl. v. fig. 15.

Phidippus ? ceratodes, p. 49, pl. iii. fig. 9, *P. sinio-fimbriatus*, Dol., p. [illegible], pl. v. fig. 16, *id. l. c.*, Sumatra.

Mœvia zonata and *M. ? quadrilineata*, spp. nn., p. 51, *id. l. c.*, Sumatra.

Amycus albo-maculatus, sp. n., *id. l. c.* p. 52, pl. iii. fig. 16, Sumatra.

Rhombonotus similis, sp. n., *id. l. c.* p. 54, pl. v. fig. 17, Sumatra.

Opisthoncus quadratarius, L. Koch, redescribed and figured from Brisbane; Koch, Arachn. Austral. p. 1337, pl. cxiv. fig. 2.

Hyllus pterygodes, L. Koch, redescribed and figured from Tahiti, Upolu and Tonga Island; *id. l. c.* p. 1399, pl. cxiii. figs. 6 & 7.

L. Koch, Arachn. Austral., describes the following new genera and species:—

Accompse ludicra, p. 132[illegible], pl. cxiii. figs. 1 & 2, Rockhampton, *A. valida*, p. 1371, pl. cxvi. figs. 3 & 4, Cape York.

Mopsus bipenicillatus, p. 1330, fig. 3, Gympe Spring, N. S. W., and *M. albo-barbatus*, p. 1333, figs. 4 & 5, Peak Downs.

Ballus concolor, p. 1335, pl. cxiv. fig. 1, Sydney, N. S. W.

Hyllus tenuipes, p. 1342, fig. 3, Peak Downs, [illegible] *barbipalpis*, p. 134[illegible] fig. 4, Gayndah, pl. cxiv.

Margaromma, g. n., for *M. funesta*, p. 1347, pl. cxiv. figs. 5 & 6, Cape York, and Sydney, N. S. W.

Erasmia, g. n., p. 1350, for *E. nigro-vittata*, p. 1351, pl. cxiv. fig. 7, Tonga Island.

Thorellia, g. n., p. 1352, for *Plexippus ensifer*, Thor., p. 1353, fig. 1, Huatrine, Upolu, *Attus piscula*, L. Koch, p. 1356, figs. 3 & 4, Upolu, Sydney, N. S. W., *T. nigriceps*, p. 1359, figs. 5 & 6, Gayndah, Sydney, Cape York, and *T. bitæniata*, p. 1363, fig. 7, Peak Downs, pl. cxv.

Sobara, g. n., for *S. bitæniata*, p. 1365, pl. cxv. figs. 8 & 9, Sydney, N. S. W.

Prostheclina, g. n., for *P. pallida*, sp. n., p. 1368, pl. cxvi. figs. 1 & 2, Sydney, N. S. W., Peak Downs, and Cape York.

Selaophora, g. n., for *S. ruber*[*-bra*], p. 1374, pl. cxvi. fig. 5, and *S. obscura*, p. 1376, pl. cxvii. fig. 1, Cape York.

Atrytone, g. n., for *A. anomala*, p. 1378, pl. cxvi. fig. 6, Sydney.

Cyrtæa, g. n., p. 1380, for *C. piligera*, sp. n., p. 1381, fig. 2, Gay[illegible] *C. alburna*, p. 1383, figs. 3 & 4, Peak Downs, Rockhampton, [illegible] p. 1386, fig. 5, Gayndah, pl. cxvii.

Eulabes, g. n., p. 1387, for *E. petulus*, p. 1388, pl. cxvii. figs. 6 [illegible] Mackay, Rockhampton, Gayndah, *E. fissidens*, p. 1391, figs. 1 & [illegible] Gayndah, Rockhampton, and Cape York, *E. tenuidens*, p. 1393, [illegible] Rockhampton, Gayndah, Cape York, *E. robustus*, p. 1396, fig. [illegible] kay, *E. tenuior*, p. 1399, figs. 6 & 7, Peak Downs, pl. cxviii.

Therosa, g. n., p. 1413, for *T. magniceps*, p. 1414, pl. cxix. fig. 7, Cape York.

Tanypus, g. n., p. 1415, for *T. semirasus*, p. 1416, pl. cxx. fig. 1, Cape York.

Hadrosoma, g. n., for *H. obscura*, p. 1418, pl. cxx. fig. 2, Cape York.

THELYPHONIDEA.

Wood-Mason, J. Notes on the Anatomy of the Scorpion Spiders (*Thelyphonus*). P. A. S. B. 1882, pp. 59 & 60.

The scent-glands of *Thelyphonus* are described; they are placed near the anus, and are paired and tubular organs of large size. The secretion in which the odour exists is supposed to be protective, and the female is more fully protected than the male by a greater development of this structure.

T. Thorell, Ann. Mus. Genov. xviii. p. 35, note 1, adopts for the Order *Thelyphonidea*, Cambr., the name *Pedipalpi*, Latr., dividing it into two sub-orders—i. *Amblypygi*, containing one family, *Phrynidæ*; ii. *Uropygi*, containing two families, *Thelyphonidæ* and *Nyctalopoidæ*; the latter = *Tartaridæ*, Cambr.

SCORPIONIDEA.

Scorpiones.

P. B. Brodie includes fossil Scorpions in his paper, P. Warw. Club, 1882, pp. 9–19. [*Cf. suprà* in General Subject.]

Joyeux-Laffuie, —. Sur l'appareil venimeux et le venin du Scorpion (*Sc. occitanus*). C. R. xcv. pp. 866–869.

The anatomical structure of the poison apparatus and its mode of action in Scorpions is fully detailed. Also the effect of the poison on a rabbit, frog, and ant. Its operation appears to be on the nervous system.

Lankester, E. Ray. Observations on Scorpions. P. R. S. xxxiii. pp. 95–104. [Abstract in J. R. Micr. Soc. (2) ii. p. 774.]

The author confirms his previous views of the affinity between *Limulus* and Scorpions. He also finds an important difference of internal anatomy between Scorpions with a triangular and those with a pentagonal sternum.

——. Notes on some habits of the Scorpions *Androctonus funestus*, Ehr., and *Euscorpius italicus*, Roes. J. L. S. xvi. pp. 455–462, woodcuts.

The Scorpions observed were kept in confinement. Among other points noted were, first, that the Scorpion can direct the blow of its sting either forwards, backwards, or to the right or left. Secondly, that a Scorpion, during the process of suffocation by chloroform, made repeated, apparently aimless, blows with its sting in the straightforward direction of the head; in one of these, the sting entered under the projecting margin of the cephalic shield. From this it is concluded that the stories of Scorpions under stress of a cincture of red-hot embers having pierced themselves, and so caused their own death, are to that extent true. The combs are conjectured to be used in effecting copulation, appearing, however, to be quite devoid of sensation.

H. Lucas, Bull. Soc. Ent. Fr. (6) ii. p. lxxvii., in a note on *Buthus quinque-striatus*, Hempr. & Ehr., remarks that the black colour of the penultimate joint of the tail and the sting is not an invariable character. In a considerable proportion of individuals it is brown or brownish only, the depth of hue decreasing in proportion to the size and age of the individual.

The same author (*op. cit.* i. p. cxlix.) relates that an example of *Androctonus australis*, Linn. (*A. funestis*, Hempr. & Ehr.), a native of South Algeria, while in confinement, buried itself completely in sand, and remained so for days together.

P. Pavesi, in a paper noted as not seen by the Recorder, Zool. Rec. xviii. *Arachn.* p. 22, "Toradelfia di uno Scorpione," Rend. Ist. Lomb. (2) xiv. fasc. viii. & ix., with woodcut figure, describes a remarkable monstrosity in an example of *Euscorpius germanicus*, Schäff., in which the body was subdivided near the hinder part, and thence prolonged into two perfect tails and stings.

Euscorpius flavicaudis, De Geer, the Coliseum, Rome, and *E. carpathicus*, Linn., Vulture, Rionero Bosco di Monticchio, Dirupata di Morano, Salita del Pollino, Castrovillare: E. Simon, Bull. Ent. Ital. xiv. p. 47.

Isometrus burdoi, sp. n., E. Simon, CR. Ent. Belg. xxvi. p. lviii., on the route from Zanzibar to the Great Lakes. *I. weberi*, sp. n., F. Karsch, B. E. Z. xxvi. p. 184, Isle of Salanga, Straits of Malacca.

Titytus tricolor, sp. n., E. Simon, *l. c.* p. lix., East Africa.

Buthus liosoma, Hempr. & Ehr., Aden, *B. dimidiatus*, p. 244, fig. 17, *B. acute-carinatus*, p. 245, fig. 18, Tes, *B. beccarii*, p. 246, fig. 19, Moka, spp. nn., E. Simon, Ann. Mus. Genov. xviii. pl. viii.

Butheolus, g. n., near *Isometrus* and *Phassus*, for *B. thalassinus*, Aden, p. 248, fig. 20; *B. aristidis*, Nubia, p. 258, fig. 23, spp. nn.: E. Simon, *l. c.* pl. viii., Southern Yemen.

Nebo flavipes, sp. n., *id. l. c.* p. 249, Tes.

F. Karsch gives a list of five species of fossil *Scorpiones* found in the coal formation—two from Illinois, one from England, and two from Bohemia; Z. geol. Ges. 1882, pp. 556–561.

Pseudoscorpiones.

Daday, E. von. Über den circulations apparat der Pseudoscorpione. Term. füzetek, iv. pp. 331–339, pl. xi. [Noted Zool. Rec. xviii. *Arachn.* p. 22, as not seen by Recorder.]

This is a preliminary notice of the author's researches into the blood and organs of circulation of Pseudoscorpions. The species chiefly examined was *Chernes hahni*, C. Koch. A comparison with some species of *Chelifer* and *Obisium* leads to the conclusion that it may be taken as typical of all the families of this sub-order. The parts chiefly referred

to are the dorsal vessel and pericardial sinus, with their form, function, and histiology.

T. Thorell (Ann. Mus. Genov. xviii. p. 36) associates *Gibbocellum*, Stecker, with the *Pseudoscorpiones*, as follows :—

Order, Chelonethi.
Sub-order i. Haplochelonethi.
Family, *Gibbocelloidæ*.
Sub-order ii. Diplochelonethi.
Family, *Cheliferoidæ*.

Chelifer javanus, sp. n., Thorell, *l. c.* p. 37, pl. v. figs. 20–22, Java. *C. quadrimaculatus*, sp. n., E. Tömószáry, Term. füzetek, v. p. 296, pl. vi., Homonna, found in company with *C. peculiaris* and *C. cimicoides*. *C. disjunctus*, L. Koch, *C. subruber*, Sim., *C. cimicoides*, Fabr., and *C. anachoreta*, Sim., recorded from Calabria ; Elvezio Cantoni, Bull. Ent. Ital. xiv. pp. 157–169.

Chernes setiger, sp. n., L. Koch, Verh. z.-b. Wien, xxxi. p. 670, Balearic Isles ; *C. cavicola*, sp. n., G. Joseph, B. E. Z. xxvi. p. 22, Grotto of Corgnale ; *C. degeeri*, C. L. Koch, new to Britain, H. Crowther, Sci. Goss. 1882, p. 227. [*Cf.* Zool. (3) vi. p. 465.]

Obisium deschmanni, sp. n., G. Joseph, *l. c.* p. 22, Grotto of Luëg.

Blothrus brevimanus, sp. n., *id. l. c.* p. 21, Kevderza, Ihanska, and Benkotova caves, Carniola.

Kreischiria, g. n., for *K. wiedri*, sp. n., H. B. Geinitz, SB. Ges. Isis, 1882, p. 31, fossil, from the coal-formation of Zirickau.

SOLPUGIDEA.

Rhax impavida, C. L. Koch, Sceik Osman, near Aden ; E. Simon, Ann. Mus. Genov. xviii. p. 209.

Biton yemenensis, sp. n., p. 210, pl. viii. fig. 1, *B. ehrenbergi*, Karsch, = *Gluvia furcillata*, Sim., ♀, p. 251, Sceik Osman, and *B. lividus*, sp. n., p. 252, Assuan, E. Simon, *l. c.*

Zombus, g. n. (allied to *Zerbina*, Karsch.) ; for *Z. pusiola*, sp. n., *id. l. c.* p. 253, S. Yemen.

PHALANGIIDEA.

G. Dimmock, "Defensive Mimicry in *Phalangidæ*," Psyche, iii. p. 299, refers to a habit observed in a number of Phalangids [no species named], on the south side of the Lake of Geneva. They were supposed to have adopted, from certain *Aranceidea*, as defensive, a habit of swinging backwards and forwards on the approach of danger.

F. Karsch, Z. geol. Ges. 1882, p. 560, characterizes a fossil Arachnid as forming a new Order, apparently most nearly allied to the *Phalangiidea*, under the name *Anthracomarti*, divided into two families—i. *Architarboidæ* ; ii. *Eophrynoidæ*. The former of these contains two genera, *Architarbus*, Scudder, and g. n. *Anthracomartus*. Body divided into two

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parts; cephalothorax not segmented; abdomen divided above and underneath into seven segments by six folds. Ventral segments divided into three parts by two longitudinal furrows. Intermediate area of last segment equal in length and breadth. Anal aperture transverse and subelliptical; legs stout, ? 5-jointed. For *A. volkelianus*, sp. n., p. 561, pl. xxi. figs. 1 & 2, coal regions of Silesia.

Architarbus, Scudder, contains two species, *A. rotundatus*, Scudd., Illinois, and *A. subovalis*, Woodw., England; F. Karsch, *l. c.*

The family *Eophrynoidæ* contains one genus, *Curculio*[*no*]*ides*, and one species, *C. prestvici*, Buckland; F. Karsch, *l. c.* p. 560.

Elvezio Cantoni (Bull. Ent. Ital. xiv. pp. 159–169) records 16 species of *Phalangiidea* from Calabria. Phalangodidæ: *Phalangodes lespesi*, Luc. Phalangiidæ: *Liobunum rotundum*, Fabr., *rupestre*, Herbst, *doriæ*, Canestr., *Phalangium opilio*, Linn., *brevicorne*, C. L. Koch, *africanum*, Luc. (several varieties of which are described), *saxatile*, Thor., *canestrinii*, Thor., *Dasylobus cavannæ*, Sim., *nicæensis*, Thor., *argentatus*, Canestr., *Acantholophus hispidus*, Herbst. Ischyropsalidæ: *Ischyropsalis luteipes*, Sim., *dispar*, Sim. Nemastomatidæ: *Nemastoma argenteo-lunulatum*, Sim. Trogulidæ: *Amopaum sœrenseni*, Thor.

De Graaf, —. Over den Bouw der Geslachtsorganen bij de Phalangiden. Leide: 1882, 4to, pp. 100, 35 pls.

An important work, written both in Dutch and French. The sexual organs of both sexes of *Phalangium cornutum*, *P. parietinum*, and *Liobunus rotundus* are fully described and figured. For a review of this work by W. M. Van Hasselt, see Tijdschr. Ent. xxvi. pp. 105–115.

L. P. Gratacap, in Am. Nat. xvi. p. 1020, details experiments in which *Phalangium dorsatum* evinced considerable excitement in oxygen, and lived twenty-four hours.

Loman, J. C. C. Beiträge tot de Anatomie der Phalangiden. Amsterdam: 1881 (Academ. Proefschrift), pp. 1–74, and 1 plate. [Noted, Zool. Rec. xviii., *Arachn.* p. 22, as not seen by Recorder.]

In the introduction, the literature on this subject is reviewed. The subject itself is treated under five heads—i. The cuticle and muscular system. ii. The intestinal channel and excretory organs. iii. Circulation and respiration. iv. Generative organs. v. Nervous system and sense organs. In the second portion of the work, the intestinal canal is divided into fore, middle, and terminal; and the Malpighian tubes are described. The sexual organs, both male and female, are fully described.

R. Rössler, Z. wiss. Zool. xxxvi. pp. 671–702, pls., treats fully on the digestive and generative systems of *Phalangiidea*. The lateral marginal thoracic glands of *Opilio albescens* were found to emit an aromatic odour, confirming the views of J. C. C. Loman.

E. Simon, Bull. Ent. Ital. xiv. pp. 38–47, records 16 species of *Phalangiidea* from Southern Italy, 4 being new. The known species are *Astrobunus kochi*, Thor., *Liobunum dorea*, Canestr., *silvaticum*, Sim., *Phalangium opilio*, Linn., *propinquum*, Luc., *segmentatum*, Sim., *Egœnus crista*,

Brullé, *Oligolophus alpinus*, Herbst, *Acantholophus spinosus*, Bosc., *horridus*, Panz., *Nemastoma argenteo-lunulatum*, Sim., *Trogulus aquaticus*, Sim. The new species are in the genera *Phalangium*, *Dasylobus*, and *Acantholophus*.

Sironoidæ, Sim., = *Cyphophthalmidæ*, Joseph; *Cyphophthalmus*, Joseph, = *Siro*, Latr.: T. Thorell, in a note to p. 23, Ann. Mus Genov. xviii This genus is included by Thorell, *l. c.*, in subordo *Anepignathi* of the order *Opiliones* (*Phalangiidea*).

Leptosalis, g. n., p. 23. Closely allied to *Stylocellus*, Westw., and *Siro*, Latr.; for *L. beccarii*, p. 25, figs. 1–9, Sumatra, and *L. javana*, p. 30, figs. 10 & 11, Java, spp. nn.; T. Thorell, *l. c.*

Siro cyphopselaphus, sp. n. (♂ only), G. Joseph, B. E. Z. xxvi., p. 20, Grotto of God-jama, near Ober-Skril.

Phalangium longicorne, sp. n., E. Simon, Bull. Ent. Ital. xiv. p. 39, Cima del Vulture, Piano e Varco dell Pollino. *P. pusillum*, p. 668, and *P. abatrusum*, p. 669, spp. nn., L. Koch, Verh. z.-b. Wien, xxxi., Balearic Isles.

Dasylobus caranna, p. 40, Vulture, Piano e Varco dell Pollino, and *D. fulvaster*, p. 42, Cima del Catria, spp. nn., E. Simon, *l. c.*

Acantholophus lemniscatus, sp. n., *id. l. c.* p. 46, Vulture.

F. Karsch notes one species of *Opiliones* (foss.), from Saxony, found in the coal formation; Z. geol. Ges. 1882, p. 556.

ACARIDEA.

Berlese, A. Il polimorphismo e la partenogenesi di alcuni Acari. Bull. Ent. Ital. xiv. pp. 88–140, and pl.

In continuation of the author's paper, *op. cit.* xiii. pp. 290–292 [*cf.* Zool. Rec. xviii. *Arachn.* p. 29]. *Gamasus* is stated to produce hexapod larva. The nymphs only develope ova when in the adult state. From a special larva of *G. tardus*, a larger octopod nymph, without sex, is produced; during its growth it casts its skin, but does not assume a different form; a slight difference is observable at a later moult between males and females, but there are no traces of any secondary sexual characters. The changes of *G. tardus*, *coleoptratorum*, and *stabularis*, and *Trachynotus inermis* are detailed. For a translation of part and summary of the remainder of this paper, see Arch. Ital. Biol. ii. pp. 108–130.

——: Indagini sulle metamorphosi di alcuni acari Insetticoli. Atti Ist. Venet. (5) viii. pp. 45 (sep. copy).

Acarids of the genus *Hypopus* are (as proved by Mégnin) heteromorphous nymphs of other *Sarcoptidæ*, which is also the case with *Homopus*, *Trichodactylus*, and others. Adult Acarids are not, as a rule, migratory; migration appears to depend on desiccation and starvation, and insects are principal agents in dispersing Acarids. A new genus and species of *Gamasidæ* are characterized; also a new species of *Sarcoptidæ* (*Tyroglyphus*). Various instances of heteromorphism are given. For a translation of this paper, see Arch. Ital. Biol. i. pp. 279–281.

CANESTRINI, G., & BERLESE, A. Nuovi Acari. Atti Soc. Pad. viii, pp. 145–153, pls. xix.–xxi. [Noted in Zool. Rec. xviii. *Arachn.* p. 32 as not seen by Recorder.]

Describes five new species—Acari parassiti, 4 species, genera *Pterolichus* and *Alloptes*; Acari liberi, 1 species, genus *Histiostoma*.

R. CANESTRINI, Atti Soc. Pad. vii. [1881] (quoted from Bull. Ent. Ital. xiii. p. 203), observes that all insects have mites, especially *Coleoptera*, *Diptera*, *Orthoptera*, and *Hymenoptera*; but that not all these mites are parasitic; the larger number are found on the insects in an immature state.

CANESTRINI, G., & CANESTRINI, R. Acari Italiani nuovi e poco noti. Atti Ist. Venet. (5) viii. pp. 913–930, pls. viii.–x.

Thirteen species contained in several families of *Acaridea* are treated of; a new genus of *Gamasidæ* is characterized, and nine new species of various genera and families are described.

CANESTRINI, R. Contribuzioni allo studio degli Acari parasiti degli Insetti. Atti Soc. Pad. vii. pp. 154–178, pl. xxii. [Omitted from former vols. of Zool. Rec.]

Refers particularly to the insects on which certain *Acari* are found. Describes one new species of *Oribatidæ*, genus *Pygmephorus*. Mentions some species of GAMASIDÆ, genera, *Gamasus*, Latr., *Uropoda*, De Geer, *Dermanyssus*, Dux., *Antennophorus*, Hall; TROMBIDIIDÆ, genera, *Otonyssus*, *Trombidium*, *Rhyncholophus*, Dug.; ORIBATIDÆ, *Hoplophora*, Koch, *Pygmophorus*, Kram.; HYDRACHNIDÆ, subfamilies, *Limnocharidæ* and *Hydrachnidæ*; ACARIDÆ [-DINÆ), *Trichodactylus*, Dug., *Tarsonemus*, Canestr., *Dermalichus*, *Alloptes*, *Heteropus*, *Pteroptus*, *Hypopus*. Distinctive characters of most of the genera are given.

HALLER, G. Gegen zwei irrthumliche Ansichten betreffend die Arachniden. Ent. Nachr. viii. pp. 200–203.

This relates to erroneous conclusions drawn from the mouth-organs and size of the *Acari*.

KRAMER, P. Beitrag zur Kenntniss der Milben-fauna Württemberg's. JH. Ver. Württ. xxxviii. pp. 293–324, pl. v.

Contains of *Acarina atracheata* 25 species, in four families and 13 genera; and *Acarina tracheata*, 90 species in 10 families and 43 genera. Among the latter are four new genera and two new species.

——. Über die segmentirung ber den Milben. Arch. f. Nat. xlviii. pp. 178–182, pl. xiii. figs. 1–4.

The segmentation referred to is that of *Alycus roseus*, C. Koch. [*Cf.* Ann. N. H. (5) x. p. 183.]

TROMBIDIIDÆ.

HENKING, H. Beitrage zur Anatomie, Entwicklungsgeschichte und Biologie von *Trombidium fuliginosum*, Herm. Z. wiss. Zool. xxxvii. pp. 553–663, pls. xxxiv.–xxxvi.

Treats on the anatomy, pp. 561–569; on the biology of the adult,

pp. 589–595; development, anatomy, and biology of the different stages, pp. 595–654. The following terms denote the different stages of development:—Schadonophan-stadium, Larva, Nympho-chrysalis, Nympho-stadium, Nymphe, Telcio-chrysalis, Teliophan-stadium, Prosopon. The literature on the development of the different groups of *Acari* is reviewed; particular reference being made to the anatomical researches of Treviranus, Croneberg, and Pagenstecker on *T. holosericeum*, and a belief expressed that Pagenstecker mistook *T. fuliginosum* for that species. The word "apoderma" is applied to the "Zwischenhaut" of Claparède, which occurs in the egg-like shape into which the larva-nymph passes.

Microtrombidium, g. n. for *Trombidium purpureum*, Koch, and *pulcherrimum*, Haller; G. Haller, JH. Ver. Württ. xxxviii. p. 322, pl. v. fig. 8, Wurtemberg.

Tanaupodes, g. n. for *T. steudelli*, sp. n., G. Haller, *l. c.* p. 325, pl. v. figs. 9 & 10.

Geckobia latastii, Mégn., described and figured; A. Berlese, Acari, Miriapodi, &c. fasc. 2, No. 1, pl. i. [no pagination].

Trombidium picturatum, p. 671, and *T. albo-micans*, p. 672, spp. nn., L. Koch, Verh. z.-b. Wien, xxxi., Balearic Isles; *T. spelæum*, sp. n., G. Joseph, B. E. Z. xxvi. p. 16, Cavern in Lower Carniola.

Rhyncholophus stalitæ, sp. n., Joseph, *l. c.* p. 15, Grotto God-jama, near Oberskril; *R. vernalis*, sp. n., L. Koch, Verh. z.-b. Wien, xxxi. p. 671, Balearic Islands; *R. phalangioides* (D.G.), A. Berlese, Acari, Miriapodi, &c. fasc. 2, No. 9, pl. ix. [no pagination given].

Eupodidæ.

Scyphius hamatus, sp. n., P. Kramer, Z. ges. Naturw. (3) vi. pl. iv. fig. 13 (no description given). [Omitted from Zool. Rec. xviii.]

Hydrachnidæ.

Haller, L. Zur Kenntniss der Sinnes-borsten der Hydrachniden. Arch. f. Nat. xlviii. pp. 32–46, pl. iv.

Treats, i., on the structure and function of the long bristles on the first pair of legs of *Atax*; ii. on the scales or leaf-formed sense-hairs of the *Acari*; iii. on the tactile hairs of the *Hydrachnidæ*; iv. on the antenniform hairs of Hydrachnids; v. on some other hair-form sense-organs whose function is supposed to be olfactory, tactile, and auditory; vi. on two chitinous processes on the palpi.

W. Saville Kent, under the heading of "Water-spiders," gives some hints and remarks on the rearing of *Hydrachnidæ* in confinement; also on the mode of killing and preserving them for microscopic observation. Sci. Goss. 1882, p. 208.

A. G. Laker remarks on a Hydrachnidous parasite on *Dytiscus marginalis*, supposed to be *Hydrachna globulus* in the larval stage. *Ibid.*

Neumann, C. J. Sur le developpement des Hydrachnides (Araignées aquatiques). Ent. Tidskr. i. p. 169.

[Noted in Zool. Rec. xviii. *Arachn.* p. 29, as not seen by the Recorder.]

After a short view of the general history of the development of Hydrachnids, the author remarks that *Limnesia pardina*, Neum., immediately after its exclusion from the egg assumes the form of other Hydrachnids at their second stage of development. From his observations he concludes that probably, like the larvæ of *Limnocharis*, the larvæ of *Eylais* pass the first stage of life on insects which live on the surface of the water, such as *Hydrometra*.

Smaris impressa, C. Koch, figured ; G. & R. Canestrini, Atti Ist. Veuet. (5) viii. pl. ix. figs. 1 & 1*c*.

Arrhenurus viridis, Dug., described and figured; C. F. George, Sci. Goss. 1882, pp. 249 & 250.

The *Arrhenuri* are (*l. c.*) divided into two sections—i. Chitinous; ii. Membranous. The first division contains the curious "tailed" mites. [*Cf. tom. cit.* p. 194.]

Arrhenurus globator, Müll., fig. (woodcut) 194–202, *luccinator*, id., fig. 203, p. 272, *maculator*, id., figs. 204–208, *viridis*, Dug., figs. 209–211, p. 273, described and figured; C. F. George, *l. c.*: in continuation of former papers [*cf.* Zool. Rec. xviii. *Arachn.* p. 29]. *A. globator*, Müll., described and figured; A. Berlese, Acari, Miriapodi, &c., fasc. 2, pl. vi. No. 6 [no pagination given].

Atax, Fabr. Various systematic and anatomical remarks are made on this genus by F. Könike; Abh. Ver. Brem. vii. pp. 265–268, under the first head, the author's statement (Revision von H. Lebert's Hydrachniden des Genfer Sees, Z. wiss. Zool. xxxv. [1881] p. 627) as to finding *Atax bonzi*, Clap., is corrected. The species should have been *A. figuratus*, Koch. The views of Claparède (Studien an *Acaridea*, op. cit. xviii. [1868] p. 474) are controverted as to the absence of an oviduct in the female, and in regard to the ejaculatory duct of the male of *Atax bonzi*.

Atax intermedius, sp. n., for *A. hypsilophorus*, Beneden, and *A. bonzi*, Clap., pt., F. Könike, *l. c.*

Gamasidæ.

Berlese, A. Gamasi nuovi e poco noti. Bull. Ent. Ital. xiv. pp. 338–352.

Tables are given comparing the genera *Podocinum*, Berl., *Holostaspis*, Kol., *Gamasus*, Latr., *Lælaps*, Koch, *Iphis*, and *Uropoda*, Latr. A new genus (*Podocinum*) is characterized, and 2 new species are described.

CANESTRINI, G., & CANESTRINI, R. I. Gamasi Italiani. Monographia. Padova: 1882, 80 pp. 7 pls.

The work done by previous authors in this group is reviewed, and the characters which serve for the distinction of species are detailed. Among these characters are the form of the mouth-tube and body; the characters of the dorsal scutum; those of the ventral plates and falces; habitat; colour, and activity. The alimentation, parthenogenesis, and polymorphism of Gamasids are also treated of at length. Polymorphism is sexual and adaptive. The *Gamasidæ* are divided into the genera *Holostaspis*, *Gamasus*, Latr., *Stilochirus*, G. & R. Canestr., *Pœcilochirus*, iid., *Lælaps*, C. Koch, *Epicrius*, Canestr. & Fanz., *Dermanyssus*, Dup., *Uropoda*, De Geer, *Polyaspis*, Berl., *Celæno*, Koch, *Pteroptus*, Duj. 34 species are described, 9 being new.

R. CANESTRINI, Atti Soc. Pad. viii. pp. 133–146, pl. viii., gives reasons for placing the genus *Nicoletiella* in the family *Oribatidæ*, and describes *N. cornuta* at some length. In a note, the author observes that (in Bull. Soc. Pad. viii.) [not seen by the Recorder], *Labidostoma*, Kram., is suppressed, that it corresponds to *Nicoletia*, Canestr. & Fanz., and that *Nicoletiella* is substituted for *Nicoletia*.

KRAMER, P. Ueber Gamasiden. Arch. f. Nat. xlviii. pp. 374–434, pls. xix. & xx.

Reference is made by the author to his former paper on the *Gamasidæ* (in 1876), and also to those subsequently published by Mégnin, Haller, Michael, G. Canestrini, and A. Berlese. The *Gamasidæ* are divided into 3 sub-families, and 6 genera :—i. *Pteroptina*, 1 genus (*Pteroptus*, Duj.); ii. *Uropodina*, 2 genera (*Uropoda*, Deg., and *Trachynotus*, Kr.); iii. *Gamasina*, 3 genera (*Sejus*, C. Koch, *Gamasus*, Linn., and *Dermanyssus*, Duj.). Various species (3 new) are described and figured.

Nicoletiella cornuta, Can. & Fanz., compared with *N. lutea*, Kram.; G. & R. Canestrini, Atti Ist. Venet. (5) viii. p. 917, pl. x.

Holostaspis tridentinus, sp. n., p. 28. Also Atti Ist. Venet. p. 919, pl. ix. figs. 3 & 3*b*. *H. longispinosus*, Kram., p. 29, *id.* Monographia, Padua, 1882. *H. niveus*, sp. n., G. Joseph, B. E. Z. xxvi. p. 14, Grotto at Seler-Hügel, near Gotschée.

Gamasus quisquiliarum, p. 920, figs. 2 & 2*f*, Rome and Messina; *G. brachiosus*, p. 921, figs. 7 & 7*b*, Messina, spp. nn., *id. l. c.* pl. viii. *G. crassipes*, Linn., p. 30, pl. ii. fig. 4, *monachus*, Koch, p. 32, pl. vi. figs. 3*a* & 3*b*, *attenuatus*, Koch, p. 34, pl. vi. figs. 5*a*–5*e*, & 7*a*–7*e*, *fucorum*, De Geer, p. 36, pls. iv. figs. 4–7, vi. figs. 6*a* & 6*b*, vii. figs. 5*a*–5*e*, *nemorensis*, Koch, p. 42, pl. vii. figs. 2*a* & 2*c*, and 1*a* & 1*b*, *calcaratus*, Koch, p. 44, pl. vii. figs. 6*a* & 6*d*, *littoralis*, Canestr., p. 46, pl. v. figs. 2, 2*a*, 2*b* & 2*c*, *falciger*, Canestr., p. 51, pl. v. figs. 3, 3*a*, 3*b* & 3*c*, *mucronatus*, Canestr., p. 52, pl. v. figs. 4 & 4*a*, *rubescens*, p. 40, figs. 2*a* & 2*b*, *cornutus*, p. 48, figs. 8*a*–8*h*, *furcatus*, p. 49, fig. 9*a*–9*d*, *spiricornis*, p. 50, figs. 9*a*–9*d*, pl. vi., spp. nn., *id.* Monographia. *G. meridionalis*, sp. n., A. Berlese, Acari, Miriapodi, &c., pt. i. No. 6, pl. vi., Sicilia, Apulia; *G. heringi*, sp. n., G. Haller, JH. Ver. Württ. xxxviii. p. 298, pl. v. figs. 1, 2 & 3; *G. longipes*, sp. n.,

Joseph, B. E. Z. 1882, p. 15, Magdalen Cave and caves of Luëg, Nussdorf, Volcja-jama, Central Carniola.

Lælaps meridionalis, p. 922, figs. 1 & 1*b*, Messina and Civita Vecchia, *L. falcinellus*, p. 923, fig. 3, Messina, spp. nn., *id. l. c.* pl. viii., *halleri*, Canestr., p. 57, figs. 1, 1*a* & 1*b*, *krameri*, id. p. 58, figs. 6, 6*a*, 6*b* & 6*c*, *horridus*, Kram., p. 59, fig. 8, 8*a*, *uncinatus*, p. 60, fig. 7, 7*a* & 7*b*, *agilis*, Koch, p. 61, figs. 1*a* & 1*b*, *pectinifer*, p. 63, figs. 5, 5*a* & 5*b*, pl v., *stabularis*, Koch, p. 65, pl. ii. figs. 5 & 5*b*, *nanus*, Még., p. 67, pl. vi. figs. 4*a* & 4*b*, *tumidulus*, Koch, p. 68, pl. ii. figs. 3 & 3*a*, pl. vii. figs. 3*a*–3*c*, *ostrinus*, Koch, p. 73, *triangularis*, Koch, p. 74, pl. vii. figs. 4*a*–4*c*, *bicornis*, Can. & Fanz., p. 76, *berlesii*, p. 71, *lignicola*, p. 73, spp. nn., *id.* Monographia.

Polyaspis, g. n. for *P. patavinus*, sp. n., A. Berlese, Atti Ist. Venet. (5) viii.; and Arch. Ital. Biol. i. p. 280, found in humus in a hot-house in the Royal Botanic Gardens at Padua.

Microcheles, g. n. for *M. serratus*, Kram.; G. Haller, JH. Ver. Württ. xxxviii. p. 301.

Discopoma, g. n., formed out of *Uropoda*, for *D. clypeata*, sp. n., p. 925, pl. viii. fig. 6 & 6*c*, Messina and Florence, and embraces also *D. cassidea*, Herm., p. 925, and *D. romana*, sp. n., p. 927, pl. viii. figs. 5 & 5*a*, *id. l. c.* Rome.

Stilochirus rovennesis, sp., G. & R. Canestrini, Monographia, p. 54; pl. vi. figs. 12*a*–12*d*.

Pœcilochirus fimetarius, Müller, p. 55, figs. 11*a*–11*d*, *carabi*, sp. n., p. 56, figs. 13*a* & 13*b*, *iid. l. c.* pl. vi.

Uropoda, Deg., divided into two tribes according to the armature of the terminal joint of the first pair of legs. Tribe 1, p. 401, comprises *U. tecta* and *elegans*, Kram., *ovalis*, Koch, and *tridentina*, Canestr. Tribe 2 (pp. 401 & 402) contains *U. clavus* and *elongata*, Haller, *splendida*, and *minima*, Kram., and *scutulata*, Mégn. (Haller); P. Kramer, Arch. f. Nat. xlviii. *U. tecta*, Kram., described, p. 403, figs. 1–6, *ovalis*, Koch, p. 408, figs. 7–12, pl. xx., *clavus*, Haller, p. 411, figs. 1, 6, 7 & 17, *elongata*, Haller, p. 414, *elegans*, p. 406, figs. 4*a*, 4*b* & 5, *splendida*, p. 414, figs. 8, 10 & 16, *minima*, p. 416, figs. 11 & 12, spp. nn., pl. xix., P. Kramer, l. c.; *U. scutulata*, p. 418, *truncata*, and *vegetans*, p. 419, noted upon, *id.* l. c.; *U. collaris*, sp. n., A. Berlese, Bull. Ent. Ital. xiv. p. 347, *U. vegetans*, De Geer, var. *pellucida*, G. Joseph, B. E. Z. xxvi. p. 14, Grotto of Luëg.

Trachynotus, Kram., characterized, and *T. pyriformis*, Kr., described and figured; P. Kramer, Arch. f. Nat. xlviii. p. 420, pl. xx. figs. 13–19.

Sejus, Koch, characterized, pp. 427–429; *S. serratus*, Kram., p. 429, figs. 20–22, *togatus*, Koch, p. 431, figs. 23 & 24, pl. xx. Kramer, *l. c.*

Podocinum, g. n. (near *Lælaps*) for *Lælaps sagax*, Berl.; A. Berlese, Bull. Ent. Ital. xiv. p. 340. The same species redescribed and figured, *id.* Acari, Miriapodi, &c., xi. fasc. i. No. 1, pl. i.

Iphis drepanogaster, fasc. i. No. 3, pl. iii., Matera, Sicily, *I. mirabilis*, fasc. i. No. 4, pl. iv., Pavia, spp. nn., A. Berlese, l. c.; *I. crinitus*, Berl., p. 343, *pterophilus*, id. p. 344, *ostrinus*, C. L. Koch, p. 346, *halleri*, Canestr., p. 347, *elongatus*, sp. n., p. 345, A. Berlese, Bull. Ent. Ital. xiv.

Holothyrus, Gerv., recharacterized and placed with various species in a new family *Holothyroidæ* (= *Gamasidæ*, auctt., pt.); T. Thorell, Ann.

Mus. Genov. xviii. p. 41. *H. longipes*, p. 41, figs. 12-17, Hatam, Mount Arfak, New Guinea, *nitidissimus*, p. 46, fig. 18, and *scutifer*, p. 47, fig. 19, Fly River, New Guinea, pl. iv., *id. l. c.*

Megisthanus, g. n., p. 48, for *M. caudatus*, p. 51, figs. 23 & 29, *brachyinus*, p. 56, figs. 30–32, pl. v., *testuda*, p. 58, figs. 33–35, Java, *dorcianus*, p. 60, figs. 36 & 37, Dorey, New Guinea, *hatamensis*, p. 61, figs. 38 & 39, Hatam, New Guinea, pl. vi., T. Thorell, *l. c.*

Carpais, Latr. Should take the place of the more recent genus *Gamasus*, for those species whose type is *G. coleoptratorum*, Linn.; *id. l. c.* p. 49.

Dermanyssus gallinæ, Redi, *lanius*, C. Koch, p. 350, *albatus*, id., and *hirundinis*, Herm., p. 351, described; A. Berlese, Bull. Ent. Ital. xiv.

Periglischrus miniopteri, sp. n., Joseph, B. E. Z. xxvi. p. 15, near Laas.

W. S. Simmons figures a minute Acarid, parasitic on a centipede, belonging apparently to the *Gamasidæ*, and probably of a new genus and species, but gives no description; Sci. Goss. 1882, p. 16, fig. 17.

Ixodidæ.

Pseudixodes, g. n. for *P.* (*Ixodes*) *holsatus*, Fabr.; G. Haller, JH. Ver. Württ. xxviii. p. 311, pl. v. fig. 5.

Hæmaphysalis? papuanus, sp. n., T. Thorell, Ann. Mus. Genov. xviii. p. 62, pl. vi. figs. 40–44 (♂), 45 (♀), Ramoi, New Guinea.

Amblyomma hippopotami, C. L. Koch, found on the journey from Zanzibar to the Great Lakes of Central Africa; E. Simon, CR. Ent. Belg. xxvi. p. lx.

Argas reflexus, Mégn. The serious effect of its bite on an infant and on an adult is detailed; and its being traced to a dovecot, destroyed six years before, related; it is thus like *Argas persicus*, which has been proved to live four years; A. Laboulbène, Bull. Soc. Ent. Fr. (6) i. pp. xcviii. & xcix.

Eschatocephalus crassipes, sp. n., Joseph, B. E. Z. xxvi. p. 16, Ihaňska-jama, Goba, &c.

Oribatidæ.

Michael, A. D. Further notes on British *Oribatidæ*. J. R. Micr. Soc. (2) ii. pp. 1–18, pls. i. & ii.

The author controverts the generally accepted idea that the *Oribatidæ* are viviparous, quoting Huxley (Man. Anat. Invertebr. Animals, 1877, p. 383) as an instance of this error. There are in fact three, if not four, modes by which the eggs are brought to maturity:—i. Eggs, as in insects; ii. As soon ready to be hatched; iii. Hatching just before deposition = viviparous, or rather ovo-viviparous; iv. Not deposited during the life of the parent, but long after death, the chitinous case of the abdomen forming a protective covering to the eggs until deposition, or rather hatching. The instance of ova found in ecto-skeletons of *Hoplophora* (Haller, MT. schw. ent. Ges. 1879, p. 502) is thus explained. The

deut-ovum stage (of Claparède) seems to be merely the strengthening of the inner membrane, as the outer (chitinous or coriaceous) covering of the ovum splits, and forms a weak place for the extrusion of the larva. This stage belongs to some of the *Oribatidæ* as well as to *Atax bonzi*, Clap., and *Trombidium fuliginosum*, Még. Some wood-boring species are remarked upon, also the moultings of *Liosoma palmicinctum*, p. 6; at p. 8, it is stated that no instance is recorded of any species of this family being habitually predatory. Five new species are described and figured.

Oribates mucronata, sp. n., G. & R. Canestrini, Atti Ist. Venet. (5) viii. p. 916, pl. ix. fig. 2, Monselice.

Pelops glaber, sp. n., *iid. l. c.* p. 915, Civita Vecchia.

Cepheus ocellatus, sp. n., Michael, *l. c.* p. 8, pl. i. figs. 6–9, Land's End, Cornwall, on yellow rock-growing lichens.

Notaspis licnophorus, p. 10, figs. 7 & 8, in decayed wood, Tamworth, Warwickshire, and Epping Forest; *N. lacustris*, p. 12, fig. 6, on sub-aqueous plants in fresh-water, generally distributed, spp. nn., *id. l. c.* pl. ii.

Scutovertex maculatus, sp. n., *id. l. c.* p. 13, pl. i. figs. 1–5, Land's End, on lichen near the sea-shore.

Damæus monilipes, sp. n., *id. l. c.* p. 16, pl. ii. figs. 1–5, on decayed wood, Tamworth and Yorkshire.

Belba denticulata, sp. n., G. & R. Canestrini, Atti Ist. Venet. (5) viii. p. 914, pl. viii. fig. 4, Messina.

Sarcoptidæ.

P. Mégnin, Bull. Soc. Ent. Fr. (6) i. p. cxxxi., refers to the immature, or nymph, stage (Hypopus) in which it attaches itself to insects for locomotive purposes.

G. Haller, Zur Kenntniss der Dermaleichiden, Arch. f. Nat. xlvii. pp. 47–79, pls. v.–viii., details a systematic arrangement of the *Dermaleichidæ*.

Tyroglyphus echinopus, Rob. & Fum., is not the enemy of the *Phylloxera*, and does not frequent the diseased vine for the purpose of preying upon it, but upon the decaying organic substances of the dead vine, as does also another Acarid, *Hoplophora nitens*, Nic.; P. Mégnin, Bull. Soc. Ent. Fr. (6) i. p. cxxxi.

Tyroglyphus carpio, Kr., Arch. f. Nat. xlviii. pp. 183–186 [recorded, Zool. Rec. xviii. *Arachn.* p. 31, from Zool. Anz. iv. p. 619]. *T. spinipes*, numerous in Hypopial stage on a *Bolitophagus*; R. Mégnin, Bull. Soc. Ent. Fr. (6) i. p. cxxxi. *T. longior*, Gerv., infesting a pork-packing house in great numbers, apparently developed from the livers, lungs, and kidneys of pigs after cooking and drying by steam; W. E. Wilson, Am. Nat. xvi. p. 599. *T. krameri*, sp. n., A. Berlese, Atti Ist. Venet. (5) viii., in decaying organic substances.

Pterocolus, g. n. (*Dermalichidæ*, Haller) for *P. bisetatus*, sp. n., G. Haller, Arch. f. Nat. xlviii. p. 70, pls. vi. figs. 9–12, vii. figs. 6–9.

Coleopterophagus, g. n. for *C. megnini*, Berl., No. 9, pl. ix., and *C. carabicola*, sp. n., No. 10, pl. x. fasc. i., Sicily; A. Berlese, Acari, Miriapodi, &c.

Pterolichus ciconiæ, p. 145, figs. 1 & 2, and *P. rehbergi*, p. 146, figs. 5 & 6, spp. nn., G. Canestrini & A. Berlese, Atti Soc. Pad. viii. pl. xix.

Alloptes cypseli, p. 147, pl. xix. figs. 3 & 4, and *A. blaptis*, p. 148, pl. xx. figs. 1 & 4, spp. nn., G. Canestrini & A. Berlese, Atti Soc. Pad. viii.

Histiostoma fimetarium, sp. n., G. Canestrini & A. Berlese, Atti Soc. Pad. viii. p. 150, pl. xxi. figs. 1–6.

Phytoptidæ.

Löw, F. Mittheilungen über Phytoptocecidien. Verh. z.-b. Wien, xxxi. pp. 1–8, pl. iii.

Describes nine new Gall Mites (*Phytoptus*) on various plants, and remarks upon six others. All caused malformations on the plants. The malformations are described, but the mites are not named.

Szaniszlo, Albert von. Beitrage zur Lebensweise der *Phytoptus vitis*, Land.,—besonders deren Ueberwinterungsart und Schädlichkeit. Term. füzetek, iv. pp. 233 & 234.

The conclusion come to is that the Acarid itself, not the egg, passes the winter in the buds of the vine branches, and that it is not noticeably injurious and need not be protected against.

Tardigrada (*Artiscoidea*).

Macrobiotus micronychius, sp. n., Joseph, B. E. Z. xxvi., p. 17, Godjama, near Ober-Skril.

Arctiscon stygium, sp. n., *id. ibid.*, Grotto of Gurk.

Tanuridæ.

R. Ramsay Wright notes that a piece of American pork skin, the sebaceous glands of which were enlarged, was crowded with multitudes of *Demodex phylloides*, Csokor (Verh. z.-b. Wien, xxix. p. 419); remarks are also made on *D. folliculorum*, *canis*, and *ovina*. Am. Nat. xvi. pp. 1009 & 1010.

MYRIOPODA.

BY

T. D. GIBSON-CARMICHAEL.

THE GENERAL SUBJECT.

1. BORRE, A. PREUDHOMME DE. Sur les Myriapodes fossiles du terrain houiller. CR. Ent. Belg. iii. pp. ciii.–cv.

2. BUTLER, A. G. Descriptions of new species of *Myriopoda* of the genus *Zephronia* from India and Sumatra. Ann. N. H. (5) ix. pp. 196–198.

Describes 3 new species.

3. ——. Descriptions of some new species of *Myriopoda* of the genus *Spirostreptus* from Madagascar. *L. c.* pp. 328–330.

Describes 3 new species (*cf.* also *l. c.* p. 406).

4. COSTA, A. Notizie ed osservazione sulla Geo-fauna Sarda. Mem. 1ª. Resultamente di richerche fatte in Sardegna nel Settembre, 1881. Atti Acc. Nap. ix. No. 11, pp. 1–42.

Enumerates 9 species of *Myriopoda*, 1 new.

5. DIMMOCK, G. On a habit of *Scolopendra morsitans*. Psyche, iii. p. 380.

6. FANZAGO, F. I Miriapodi del Sassarese. Parte descrittiva, fasc. i. Sassari : 1881.

This paper, referred to but not seen by the Recorder for 1881, describes species of *Lithobius* and *Geophilus*, 1 new.

7. ——. Catalogo degli animali raccolti al Vulture, al Pollino, ed in altri luoghi dell' Italia meridionale e centrale—Miriapodi. Bull. Ent. Ital. xiv. pp. 48–51.

A list of 30 species, 1 new.

8. GIBSON-CARMICHAEL, T. D. A preliminary List of Scotch *Myriopoda*. P. Phys. Soc. Edinb. vii. pp. 193–196.

A list of 18 species with localities.

9. ——. Some Notes on Collecting and Preserving *Myriopoda*. Scot. Nat. vi. pp. 201–203.

10. Guldenstreeden-Egeling, C. Bildung von Blausaüre bei einem Myriapoden (*Fontaria*). Arch. ges. Phys. xxviii. p. 576.

Notes on the secretion of hydrocyanic acid by a species of *Fontaria* found in greenhouses in Holland.

11. Haase, Erich. Beitrag zur Phylogenie und Ontogenie der Chilopoden. Abstract by F. Karsch in Biol. Centralbl. ii. pp. 261–264.

The paper of which this is an abstract, was not seen by the Recorder for 1881. It is an attempt at supplying a pedigree of the *Chilopoda*, founded on anatomical and embryological considerations. *Myriopoda* and *Insecta* seem to be derived from a common ancestral form. The *Protosymphyla*, which form one of the divisions arising from *Prototracheata*, are the ancestors of the *Symphyla*, *Thysanura*, and *Protochilopoda*. *Protochilopoda* divide into *Protanamorpha* (from which the *Lithobiidæ* and *Scutigeridæ* are descended) and *Protepimorpha*, from which recent *Chilopoda Epimorpha* are descended, through *Protoscolopendridæ* and *Protogeophilidæ*.

12. Koch, Ludwig. Zoologische Ergebnisse von Excursionen auf den Balearen. Arachniden und Myriapoden. Wien, 1882. 8vo, 2 pls.

This is the same as the paper published in Verh. z.-b. Wien, xxxi., and recorded in Zool. Rec. xvii.

13. Latzel, R. Descrizione di un nuovo Litobio Italiano, *Lithobius tylopus*. Bull. Ent. Ital. xiv. p. 223.

14. ——. Artropodi raccolti a Lavaiano (Provincia di Pisa) da G. Cavanna. Miriapodi. Bull. Ent. Ital. xiv. pp. 366 & 367.

A list of 14 species, 1 of them new.

15. ——. Ein neuer Lithobius aus Ungarn und Serbien. Zool. Anz. v. p. 332.

16. Lucas, H. Sur les Chilopodes de la famille des Scolopendrides (gen. *Eucorybas*). Ann. Soc. Ent. Fr. (6) ii. pp. lxviii. & lxix.

17. Muhr, J. Die Mundtheile von *Scolopendrella* und *Polyzonium*, 10. JB. deutsch. Staats-Gymnas. Prag (Altstadt), pp. 3–11.

18. Passerini, Napoleone. Sull' organo ventrale del *Geophilus gabrielis*, Fabr. Bull. Ent. Ital. xiv. pp. 323–328.

In the median ventral line of *Himantarium gabrielis* are situated disks, one to each foot-bearing segment, each disk being about 2 mm. in diameter in the adult; in the centre of these disks open about a hundred ducts, each springing from a long pyriform gland; the structure of these glands, and their relations to the nervous and tracheal systems, are described. These glands secrete a red liquid which has an acid reaction, and coagulates in air; its composition is analogous to that of silk. If the animal be irritated it turns up its ventral surface, and the disks become covered with the fluid, so that possibly they serve as a means of defence.

19. Peach, B. N. On some Fossil Myriapods from the Lower Old Red Sandstone. P. Phys. Soc. Edinb. vii. pp. 177–188.

These Myriapods are *Kampecaris* [*Campe-*] *forfarensis* (described and

figured as a larval form of an Isopod Crustacean by the late David Page in his "Advanced Text-book," 1st edn., p. 135, fig. 4) and *Archidesmus macnicolli* (g. & sp. nn.); they are the oldest animals as yet described, and of simpler construction than any other known *Chilognatha*. The body segments are all free, and each bears but one pair of legs.

20. Ryder, J. A. Genera of the *Scolopendrellidæ*. P. U. S. Nat. Mus. v. p. 234.

There are two forms of this group:—1. *Scolopendrella*, Gervais, slender, tapering anteriorly, stomata on upper surface of elongated head; *S. notacantha*, Gervais, and *S. microcolpa*, Muhr. 2. *Scutigerella*, g. n., broader, of nearly uniform width, stomata lateral, head nearly circular, appendages of legs more developed; *S. immaculata*, Newp., and *S. gratiæ*, Ryder.

21. Scudder, S. H. *Archipolypoda*, a subordinal type of spined Myriopods from the Carboniferous formation. Mem. Bost. Soc. iii. pp. 143–182, 4 pls.

Describes known *Archipolypoda* which are comprised in four genera:—1. *Acantherpestes*, Meek & Worthen, with three rows of spines on each side. 2. *Euphoberia*, Meek & Worthen, with two rows of spines on each side. 3. *Amynilyspes*, g. n., with one row of spines on each side. 4. *Eileticus*, g. n., with tubercles merely, not spines. 7 new species are described.

22. ——. The affinities of *Palæocampa*, Meek & Worthen, as evidences of the wide diversity of type in the earliest known Myriopods. Am. J. Sci. (3) xxiv. pp. 161–170; Ann. N. H. (5) x. pp. 286–295. Abstract in J. R. Micr. Soc. (2) ii. pp. 773 & 774.

Palæocampa is neither a worm nor the larval form of a Lepidopterous insect, but a Myriopod. The examination of it brings out two remarkable facts: first, the extraordinarily high organization of the dermal appendages in these ancient Myriopods; and, secondly, that at a very early period there was almost as great a divergency in the structure of Myriopods as there is at the present time. It is probable that *Myriopoda* appeared before Insects, and that the earlier types were aquatic. Scudder wonders that *Myriopoda* should not have been found in strata older than the carboniferous. [*Cf.* Peach, *suprà*.]

23. Sograff, N. Zur Embryologie der Chilopoden. Zool. Anz. v. pp. 582–595.

Describes the earlier stages of development in the egg of *Geophilus ferrugineus* and *G. proximus*. The egg while in the oviduct is enveloped in a transparent coat formed of the united chorion and yelk-membrane; it is filled with yelk which conceals the germinal vesicle and yelk nucleus. On one occasion a nucleated mass of protoplasm was observed in the centre. The nucleus and protoplasm divide into a number of cleavage masses, stellate at the periphery, round or polygonal at the centre. Yelk-cleavage then follows, the yelk breaking into pyramidal masses bearing portions of protoplasm at their apices. This cleavage is not dichotomous. In all cases observed the number of these pyramids

was the same. Their origin is probably simultaneous. The protoplasm masses at their apices sink into the pyramids and form the primary endoderm; while the central protoplasm masses coming to the surface of the ovum form the primary ectoderm. The blastoderm at first consists of large thin cells, dividing very rapidly into a number of minute cells, smaller on one side of the ovum than on the other. On this side, the primitive streak appears, the anterior end appearing first. The first segments with their appendages are developed before the hinder portion of the streak is clearly seen. Before the appearance of the streak, however, the mesoderm is divided off from the ectoderm. The conversion of the yelk pyramids into endoderm begins at the same time as the flexion of the embryo, at a stage not observed by Metschnikoff.

24. Tömösvary, J. Eine neue Myriapoden-Gattung und Art. *Edentistoma octosulcata*. Term. füzetek, v. pp. 298 & 299, pl. ii.

25. Vosges, E. Das Respirationssystem der Scutigeriden. Zool. Anz. v. pp. 57–69.

The respiratory system of the *Scutigeridæ*, which is minutely described, is, in spite of the peculiar position of the stomata and the absence of the usual spiral thickenings of the walls of the tracheæ, a true tracheal system. Even its peculiarities find analogues in other *Myriopoda*.

26. Weber, M. Über eine Cyanwasserstoffsaüre bereitende Drüse. Arch. mikr. Anat. xxi. pp. 468–475.

[*Cf.* Guldensteeden-Egeling, *suprà*.]

27. ——. *Blaniulus guttulatus* nelle patate. Bull. Ent. Ital. xiv. pp. 404 & 405.

Note on the occurrence of this Myriopod in potatoes in France.

A general sketch of *Myriopoda* by W. S. Dallas in vol. vi. of Cassell's Natural History, edited by P. M. Duncan. London: 1882, 4to, p. 158 *et seq.*

Dubious estimate of 50 Myriopods in British India; W. T. Blanford, Rep. Brit. Ass. li. p. 678.

For *Myriopoda* of Tyrol, see Dalla Torre, *posteà*, Insecta, p. 3. G. Joseph, B. E. Z. xxvi., in a list of Arthropods found in the Tropfstein Caves, Carniola, describes *Brachydesmus subterraneus*, C. Heller, var. n. *fragilis*, p. 23, from various caves in Lower Carniola, and *Scolopendrella immaculata*, Newp., var. *anophthalma*, p. 24, cave at Gurk.

A note by J. Chatin on the structure of marginal cells in the Malpighian tubes of *Iulus terrestris*; Ann. Sci. Nat. xiv (3).

Lithobius. Twelve species from the Caucasus described by Selivanoff, Troudy Ent. Ross. xii. pp. 177–198, pl. i., including besides new species, *L. viriatus*, Sel., and varr. *multidentatus* and *similis*, pp. 182–184, *L. mutabilis*, Koch, fig. 6, p. 186, and *L. pusillus*, figs. 19 & 20, p. 193.

New Genera.

Edentistoma, Tömösvary (24).
Scutigerella, Ryder (20).
Archidesmus (foss.), Peach (19).
Amynilyspes (foss.), Scudder (21).
Eileticus (foss.), *id. l. c.*

New Species.

(Recent.)

Scutigerella gratiæ, Ryder (20).
Edentistoma octo-sulcata[*-tum*], Tömösvary (24), Matang, Borneo.
Zephronia tumida (North Assam), p. 196, fig. 1, *marmorata* (India), and *barbata*, (Sumatra), fig. 2, p. 197, Butler (2).
Zephronia butleri, Olliff, Cist. Ent. iii. p. 29, fig. 2 (antenna), Borneo.
Spirostreptus cowani, *trachydesmus*, *corculus*, Butler (3).
Lithobius kessleri, fig. 3, p. 179, *oblongus*, figs. 1 & 2, p. 180, *portchinskii*, figs. 4 & 5, p. 181, *cronebergi*, figs. 8 & 9, p. 185, *caucasicus*, fig. 7, p. 188, *coloratus*, figs. 10 & 11, p. 189, *taczanovskii*, figs. 12–15, p. 190, *elegans*, figs. 16–18, p. 191, *stuxbergi*, fig. 21, p. 194, Selivanoff, *l. c.*, Caucasus.
Lithobius (*Hemilithobius*) *turritanus*, Fanzago (6). *L. brachycephalus*, id. (7). *L. tylopus*, Latzel (13 & 14).
Lithobius (*Eulithobius*) *transylvanicus*, Latzel (15).
Cryptops breviunguis, Costa (4).

(Fossil.)

Archidesmus macnicolli, Peach (19).
Amynilyspes wortheni, Scudder (21).
Eileticus anthracinus, id. *l. c.*
Euphoberia horrida, *granosa*, *carri*, *flabellata*, and *anguilla*, id. *l. c.*

INSECTA.

THE GENERAL SUBJECT.

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

André, E. La Structure et la Biologie des Insectes. Pp. 200, pls. v. Reprinted from the Introduction to Spec. Hym. i.

——. Les Parasites et les Maladies de la Vigne. Paris: 1882. [Not seen by the Recorder.]

Aurivillius, C., & Schöyen, W. M. Svensk-Norsk Entomologisk Literatur, 1881. Ent. Tidskr. iii. pp. 91-93.

Austin, E. P. A Manual of Entomology. Directions for Collecting, Preparing, and Mounting Insects of all Orders. Boston: 1882, 12mo.

Becker, A. Reise nach den südlichen Daghestan. Bull. Mosc. lvi. 3, pp. 189-208.

Includes lists of captures of insects of various Orders.

Bellesme, Jousset de. Remarques sur la respiration des Insectes. Assoc. Fr. ix. pp. 710-712 & 720.

When insects are placed in a vacuum, or in an inert gas, or their stigmata are closed, respiration and movement cease, but the presence of oxygen speedily revives them, even after several hours or days. But insects exposed to poisonous gas, or a poisonous liquid, are speedily killed, which proves that they are unable to close their stigmata against deleterious liquids.

Bennett, A. W. On the constancy of Insects in their visits to Flowers. Rep. Brit. Ass. li. pp. 667 & 668 [*cf.* also Gard. Chron. (2) xvi. pp. 365 & 366].

The *Apidæ*, especially the hive-bee, *Cynthia cardui*, and *Vanessa urticæ*, are very constant, but the *Syrphidæ*, the *Peridæ*, *Satyridæ*, and *Lycænidæ* are much less so. The author doubts if many flowers are dependent on butterflies for their fertilization.

Bergroth, E. Finsk entomologisk Literatur, 1881. Ent. Tidskr. iii. p. 90.

Camerano, L. Anatomia degli Insetti. Torino: 1882, 8vo, pp. viii. & 251, pls. ix. & 57 woodcuts.

The different divisions of insect anatomy are dealt with in separate chapters, to each of which a special bibliography is appended.

Candèze, E. La Gileppe, les infortunes d'une population d'insectes. Paris: 8vo.

A popular work. (*Cf.* S. E. Z. xliii. p. 83.)

Canestrini, R. Contribuzione allo studio degli Acari Parassiti degli Insetti. Atti Soc. Pad. vii. pp. 154–178.

Lists of mites, and of the insects which they infest.

Cavanna, G. Narrazione della escursione fatto al Vulture ed al Pollino nel Luglio del 1880 da A. Biondi, C. Caroti e G. Cavanna. Bull. Ent. Ital. xiv. pp. 3–30.

——. Parte Seconda. Catalogo degli animali raccolti al Vulture, al Pollino, ed in altri luoghi dell' Italia meridionale e centrale. *L. c.* pp. 31–87.

Includes *Arachnida*, by Simon; *Myriopoda*, by Fanzago; *Orthoptera*, by Targioni-Tozetti & Stefanelli; *Neuroptera*, by Mc.Lachlan; *Hemiptera*, by Cavanna; *Lepidoptera*, by Ceirò & Mancini; *Coleoptera*, by Baudi di Selve, Piccioli, & Cavanna; and *Hymenoptera*, by Gribodo & Emery. A few new species of *Arachnida*, &c., are described.

——. Contributo alla Fauna dell' Italia Centrale. Artropodi raccolti a Lavaiano (Provincia di Pisa. Cataloghi con note, di E. Simon, R. Latzel, A. Targioni-Tozzetti, G. Cavanna, P. M. Ferrari, G. Carobbi, F. Baudi di Selve, F. Piccioli, e P. Magretti). Bull. Ent. Ital. xiv. pp. 353–383.

Includes catalogues of *Arachnida*, *Myriopoda*, and *Insecta*. The notes are unimportant.

Chatin, J. Note sur la structure de noyau dans les cellules marginales des tubes de Malpighi chez les insectes et les Myriapodes. Ann. Sci. Nat. xiv. 3, pp. 7, plate.

The author's observations confirm those of Balbiani on the same subject. His observations have been made on *Gryllotalpa vulgaris*, *Carabus auratus*, *Papilio machaon*, *Iulus terrestris* and *Apis mellifica*.

Ciaccio, G. V. Della notomia minuta di quei muscoli che negli insetti muovono le ali. Rend. Acc. Bol. 1882.

[Not seen by the Recorder.]

Comstock, J. H. Guide to Practical Work in Elementary Entomology. An outline for the use of students of the Entomological Laboratory of Cornell University. Part i. Ithaca, New York: 8vo. pp. 35. (*Cf.* Canad. Ent. xiv. p. 118.)

Contains two chapters; one explaining the terms denoting position and direction of parts of insects generally; and the other explaining the external anatomy of a grasshopper (*Caloptenus femur-rubrum*, Harr.).

Cooke, B. On the classification of Insects. Naturalist, viii. pp. 65–71.

The following arrangement is proposed:—

Division I. Pupa unable to feed.	Division II. Pupa able to feed.
1. *Coleoptera.*	1. *Neuroptera Odonata.*
2. *Hymenoptera.*	2. *Neuroptera Hetera.* (*Perlidæ, Ephemeridæ, Psocidæ, Termitidæ.*
3. *Diptera.*	3. *Orthoptera.*
4. *Lepidoptera.*	4. *Hemiptera.*
5. *Trichoptera.*	5. *Homoptera.*
6. *Stegoptera* (Newman, in part, = *Neuroptera Planipennia*).	6. *Thysanoptera.*

Costa, A. Rapporto preliminare e sommario sulle ricerche zoologiche fatte in Sardegna durante la primavera del 1882. Rend. Acc. Nap. xxi. pp. 189–201.

Includes general remarks on the insects captured, a list of *Coleoptera*, and preliminary diagnoses of several new insects, chiefly *Hymenoptera*.

——. Notizie ed osservazioni sulla Geo-Fauna Sarda. Memoria prima. Resultamento di ricerche fatte in Sardegna nel settembre 1881. Atti Acc. Nap. ix. 11, pp. 41.

Includes an account of the journey, and a list of species of insects, &c., taken, including descriptions of several new ones.

——. Relazione di un viaggio nelle Calabrie per ricerche zoologiche fatto nelle state dell 1876. *L. c.* ix. 6, pp. 63, plate [1881].

Includes lists of insects captured, and descriptions of several new species.

Dalla Torre, K. W. v. Anleitung zur Beobachtung der alpinen Thierwelt. Munich: 1881, 8vo, pp. xii. & 114. (*Cf.* Kosmos, xi. pp. 159 & 160).

——. Beiträge zur Arthropoden-Fauna Tirols, i. Ber. Ver. Innsbr. xii. pp. 32–73.

Includes lists of the *Orthoptera*, *Pseudoneuroptera*, *Rhynchota*, *Ichneumonidæ*, *Arachnida*, and *Myriopoda* of Tyrol, and descriptions of 3 new *Tenthredinidæ*.

Deichmüller, J. V. Fossile Insecten aus dem Diatomeenschiefer von Kutschlin bei Bilin, Böhmen. Verh. L.-C. Ak. xlii. [1881] pp. 295–331, pl. xxi.

[redacted]s fossil species of *Coleoptera*, *Hymenoptera*, and *Hemiptera*, [redacted]ew. The majority show tropical characters, and but little [redacted]vith fossil insects hitherto described from other localities.

Dewitz, H. Ueber die Führung an den Körperanhängen der Insecten, speciell betrachtet an der Legescheide der Acridier, dem Stachel der Meliponen, und den Mundtheilen der Larve von *Myrmeleon*, nebst Beschreibung dieser Organe. B. E. Z. xxvi. pp. 51–68, figs.

The close analogies and homologies of the mouth-parts and abdominal appendages in various insects are pointed out.

[Dewitz, H.] Wie ist es den Stubenfliegen und vielen anderen Insecten möglich, an senkrechten Glaswänden emporzulaufen? SB. nat. Fr. 1882, pp. 5–7.

The author's observations confirm the opinion that the power of flies and other Insects to walk on perpendicular glass is due to a transparent adhesive secretion on the hairs surrounding the pulvillæ.

——. Mittheilung über den Kletter-apparat der Insekten. *L. c.* pp. 109–113.

In this second paper, the structure of the glands, &c., which communicate with the hairs, is briefly described, chiefly as observed in various *Coleoptera*. There is an abstract of both papers in Ent. Nachr. viii. pp. 51–53 & 247–250.

Duncan, P. M. Cassell's Natural History, Vol. vi. London: 1882, 4to, woodcuts.

The conclusion of vol. vi., published in 1882, contains the following entomological matter by W. S. Dallas: Chap. xii. *Diptera* and *Aphaniptera* (conclusion), pp. 73–101; chap. xiii. *Rhynchota*, pp. 101–118; chap. xiv. *Orthoptera*, pp. 118–149. The classes *Myriopoda* (pp. 150–157) and *Arachnida* (pp. 158–188) are likewise discussed by the same author; and *Crustacea* (pp. 189–220) by H. Woodward, with concluding remarks on *Arthropoda* (pp. 221–223) by Dallas & Woodward.

Frenzel, J. Ueber Bau und Thätigkeit des Verdauungskanals der Larve des *Tenebrio molitor* und Berücksichtigung anderer Arthropoden. B. E. Z. xxvi. pp. 267–316, pl. v. and figs. [Preliminary abstract, Zool. Anz. v. pp. 215–217.]

This paper treats of the microscopical examination of the intestinal parts in fresh specimens, and especially the structure and analysis of the crystalloid nucleus; on the examination of transverse sections, and the general physiology of the digestive secretion, and its action; and the questions of reabsorption and a gall-like secretion. The author's results are summed up as follows:—(1) The first portion of the intestine in *Tenebrio molitor* (larva) serves only as a canal, and possesses no special secretion. (2) The middle portion has no chitinous or other cuticle, but the epithelial cells are fringed with fine hairs. (3) The epithelium of the middle intestine secretes the digestive fluid, but does not reduce osmic acid. (4) Every nucleus of the principal cells of the epithelium [illegible] the middle intestine normally contains a crystal-like quadrangul[illegible]n-boid) or hexagonal plate. (5) *T. molitor* (larva) possesses two [illegible] digestive fluids, a tryptic and a diastatic, and is adapted for a d[illegible] posed of albumen and carbonic hydrate. (6) Phosphorus and mag[illegible] are both contained in the digestive secretion of insects. Both substances are probably set free by decomposition of the cells, and form with ammonia crystals of phosphate of ammonia and magnesia. (7) It is not unlikely that a reabsorption takes place in the middle intestine of insects. (8) The terminal intestine of insects serves as an excretory organ for undigested food, and has no special secretion. (9) A reabsorption in the

terminal intestine is probable, but not yet proved. (10) Insects have neither liver nor any gall-like excretion.

Fritsch, A. Fossile Arthropoden aus der Steinkohlen- und Kreideformation Böhmens. Beitr. Pal. Osterr.-Ung. ii. pp. 1–7, pls. i. & ii.

Relates to the following new species:—*Palingenia feistmanteli*, *Silphites priscus*, *Otiorhynchites constans*, *Brachinites truncatus*, *Tinea araliæ*, *Nematus cretaceus*, and *Phryganea micacea*.

Girard, M. Traité élémentaire d'Entomologie, iii. (1). Hyménoptères térébrants et Macro-Lépidoptères. Paris: 1881, 8vo, pp. 640, and atlas of 23 pls.

Glaser, L. Die innere Verwandschaft der Pflanzengruppen wird durch die Insecten-Ernährung kundgethan. Zool. Gart. xxii. pp. 340–345.

Most insects will eat plants which are nearly related to their natural food, though dissimilar in appearance. Thus several of the large *Ailanthus* or *Ricinus*-feeding *Saturniidæ* will eat willow.

Godman, F. Ducane, & Salvin, O. Biologia Centrali-Americana; or Contributions to the Knowledge of the Fauna and Flora of Mexico and Central America. Zoology, pts. xv.–xx.

The portion published in 1882 includes the following sections relating to Entomology:—

Lepidoptera Rhopalocera, by F. D. Godman & O. Salvin, pp. 169–224, pls. xix.–xxiii.

Coleoptera, i. (1), by H. W. Bates, pp. 41–152, pls. iii.–v.

Coleoptera, i. (2), by D. Sharp, pp. 1–144, pls. i.–iv.

Coleoptera, iii. (1), by C. O. Waterhouse, pp. 1–32, pls. i & ii.

Coleoptera, iii. (2), by H. S. Gorham, pp. 113–168, pls. vii.–ix.

Coleoptera, vi. (1), by M. Jacoby, pp. 145–224, pls. viii.–xi.

Rhynchota Heteroptera, by W. L. Distant, pp. 169–224, pls. xvi.–xix.

Graber, V. Die chordotonalen Sinnesorgane und das Gehör der Insecten. i. Morphologischer Theil. Arch. mikr. Anat. xx. pp. 506–640, pls. xxx.–xxxv., and 4 woodcuts; ii. Physiologischer Theil, *op. cit.* xxi. pp. 65–145, woodcuts.

It is impossible to do more than indicate the principal subdivisions of this paper. They are as follows:—Introductory remarks; structure of the chordotonal organs; structure of the scolopophoræ (or tube-like terminations of the chordotonal nerve); structure of the scolopophorous system; distribution of the chordotonal organs; genetic relationship between the various constituents of the chordotonal organs; cases of homology of these organs, and of their homotopic convergence; bibliography. About half the figures are devoted to larval organs, and the rest to the chordotonal organs of the halteres and wings of perfect insects. The second part of the paper treats of the hearing of insects, their sensitiveness to sound, and the functions and mechanism of the chordotonal organs, which the writer declares to be indisputably organs of hearing.

Hagen, H. A. Entomology. Harvard Register, iii. pp. 75–79 (Feb. 1881).

Contains an interesting account of the entomological collections and system of arrangement adopted in the Museum of Comparative Zoology in Harvard University.

——. List of papers of T. W. Harris, not mentioned in the list of his writings in the "Entomological Correspondence." P. Bost. Soc. xxi. pp. 150–152.

Hocejo y Rosillo, J. Manual de Entomologia, i. Madrid: 1882, 8vo, pp. 248.

[Not seen by the Recorder.]

Inchbald, P. Observations upon our plant-feeding and gall-making *Diptera* and *Hymenoptera* in 1882. Ent. xv. pp. 217–222.

Extracts from an entomological diary. They consist of short general remarks on various *Tenthredinidæ*, *Cynipidæ*, *Trypetidæ*, *Cecidomyiidæ*, &c.

Jaworowski, A. Vorläufige Resultate entwickelungsgeschichtlicher und anatomischer Untersuchungen über den Eierstock bei Chironomus und einigen anderer Insecten. Zool. Anz. v. pp. 653–657.

Treats of the development of the ovary in the larva as well as in the imago; but the paper does not admit of abridgment.

Joseph, G. Systematisches Verzeichniss der in der Tropfstein-Grotten von Krain einheimischen Arthropoden, nebst Diagnosen der vom Verfasser entdeckten und bisher noch nicht beschriebenen Arten. (Schluss der Abhandl. Erfahrungen im wissenschaftlichen Sammeln und Beobachten der den Krainer Tropfsteingrotten eigenen Arthropoden: B. E. Z. xxv. pp. 233–282.) B. E. Z. xxvi. pp. 1–50.

Includes *Crustacea*, *Arachnida*, *Myriopoda*, and *Insecta*. 109 species are enumerated, including several new ones. [*Cf.* Zool. Rec. xviii. *Ins.* p. 6.]

Karsch, A. Die Insectenwelt. Ein Taschenbuch zu entomologischen Excursionen für Lehrer und Lernende. 2te Auflage. Leipzig: 1880, [*cf.* Löw, Wien. E. Z. i. pp. 312 & 313].

Kraepelin, K. Ueber die Mundwerkzeuge der saugenden Insecten. Zool. Anz. v. pp. 574–579, woodcuts.

Relates chiefly to *Apidæ*, *Diptera*, and *Hemiptera*.

Lewis, G. A Supplementary Note on the specific modifications of Japanese *Carabi*, and some observations on the mechanical action of solar rays in relation to colour during the evolution of species. Tr. E. Soc. 1882, pp. 503–530.

The writer argues that sunlight, rather than natural selection, is the cause of bright colours in insects.

Lubbock, [Sir] J. On the Sense of Colour among some of the Lower Animals. Rep. Brit. Ass. li. pp. 676 & 677.

The writer's experiments lead him to the conclusion that bees prefer

blue to any other colour. He also suggests that all blue flowers have once been yellow or white.

MALFATTI, G. Bibliografia della Insetti fossili Italiani finora conosciuti. Atti Soc. Ital. xxiv. pp. 89–100.

Includes notices of insects in amber as well as in earthy deposits.

MARSEUL, S. A. Les Entomologistes et leurs écrits. L'Ab. 1882, pp. 1–24.

A useful compendium, giving the names of various eminent entomologists, with brief particulars respecting them, and a list of their works.

MATHEW, G. F. Entomological Notes from Teneriffe, St. Vincent, &c. Ent. M. M. xviii. pp. 256–259.

MOSLEY, S. L. On the Classification of British Insects. Naturalist, vii. p. 188, viii. pp. 4–9, 24–26.

After a sketch of the systems of Swammerdam, Linné, Olivier, and Newman, the following arrangement of the Orders of British winged insects is proposed:—*Hemiptera*, *Orthoptera*, *Coleoptera*, *Neuroptera*, *Lepidoptera*, *Hymenoptera*, and *Diptera*.

MÜLLER, H. Geschichte der Erklärungsversuche in Bezug auf die biologische Bedeutung der Blumenfarben. Kosmos, xii. pp. 117–137.

Includes observations on the relations of flowers and insects.

——. Weitere Beobachtungen über Befruchtung der Blumen durch Insekten, iii. Verh. Ver. Rheinl. xxix. pp. 1–104, pls. i. & ii.

Contains lists of plants of various families, and of the insects which frequent them. The figures represent details of various flowers.

NUSBAUM, J. Zur Entwicklungsgeschichte der Ausführungsgänge der Sexualdrüsen bei den Insecten. Zool. Anz. v. pp. 637–643.

From the hinder filaments of the nucleus of the sexual organs only the vasa deferentia or oviduct arise; the other parts being all developed from the cuticular epithelium. The external passages originate as double nuclei; all the unpaired parts originate from adjacent paired parts, and are thus to be regarded as secondary or more complex forms. The male and female external passages are perfectly homologous organs. The tissues of the oviduct, uterus, and vagina in ♀, and those of the vasa deferentia, the accessory organs, and the ductus ejaculatorius in ♂ arise quite independently of each other, and have only a secondary connection.

ORMEROD, E. A. Quarterly Report of the Consulting Entomologist. J. R. Agric. Soc. (2) xviii. pp. 599–604.

Relates to *Crioceris asparagi*, *Sitones lineata* and *puncticollis*, *Hylemyia coarctata* and *Anthonomus pomorum*.

PARFITT, E. The Fauna of Devon (*Euplecoptera*, *Orthoptera*, and *Homoptera* [in part]). Tr. Devon. Ass. xiv. pp. 364–386.

No new species described; the *Homoptera* enumerated belong to the *Fulgorina*, *Membracina* and *Cicadellina*. Remarks on the stridulation of grasshoppers, and on the frothy and waxy secretions of *Homoptera* are prefixed to the paper.

Pèragallo, A. Insectes nuisibles à l'Agriculture. i. L'Olivier, son histoire, sa culture, ses ennemis, et ses amis. ii. Le Frelon (*Vespa crabro*) et son nid. Nice: 1882, 8vo, pp. 180, pl. col.

[*Cf.* Fauvel, Rev. d'Ent. i. pp. 46–48.]

Perroncito, E. I Parassiti dell' uomo e degli animali utili. Delle più comuni malattie da essi prodotte profilassi e cura relativa. (Biblioteca Medica Contemporanea.) Bologna: 1882, 8vo, pp. xii. & 506, 14 pls., and 233 woodcuts.

Various species of *Arachnida* (pp. 425–461), *Insecta* (*Diptera*, *Aphaniptera*, *Anoplura*, *Mallophaga*, *Hemiptera*, and *Lepidoptera*, pp. 461–497), and *Crustacea* (pp. 497–499), are noticed and figured in this work as injurious to men and animals.

Plateau, F. Recherches expérimentales sur les mouvements respiratoires des Insectes. Communication préliminaire. Bull. Ac. Belg. (3) iii. pp. 727–738. [*Cf.* Nature, xxvi. pp. 454 & 455; Kosmos, xii. pp. 57–79.]

The author's principal conclusions are as follows:—(1) There is no direct connection between the structure of the respiratory organs of an insect and its actual affinities. (2) The abdomen invariably contracts during expiration. (3) Changes in the vertical diameter may be accompanied by changes in the transverse diameter. (4) Changes in the length of the abdomen during respiration are rare. (5) The thoracic segments do not usually share in the respiratory movements of an insect at rest. (6) Undulatory movements are rarer than has been supposed. (7) Pauses in the respiratory phases are generally due to inspiration. (8) In large insects, inspiration is more gentle than expiration. (9) In most insects, expiration is active and inspiration passive. (10) Nearly all insects possess expiratory muscles only. (11) The upper and lower diaphragms of *Hymenoptera* do not contribute to respiration in the way supposed by Wolff. (12) In most if not all insects, the general movements of the body are communicated to the abdomen, but these must not be confounded with respiratory movements. (13) The respiratory movements of insects are purely reflex. (14) The metathoracic ganglia are not special respiratory centres. (15) The absence of respiratory movements in *Dytiscidæ*, &c., in consequence of the destruction of the metathoracic ganglia, is due to the condensed condition of their nervous system, some of the abdominal ganglia being fused with those of the metathorax. (16) In insects with a condensed nervous system, the excitation or partial destruction of a complex nervous mass resulting from the junction of successive ganglionic centres, always affects all the centres entering into the constitution of the mass.

Preyer, W. B. Further Tropical Notes. Ent. M. M. xix. pp. 59–61.

Relates to the comparative scarcity of insects, &c., in tropical forests.

Puton, A. De l'insuffisance du caractère unique pour la distinction des espèces. Rev. d'Ent. i. pp. 88–90.

Points out the various characters in which insects may vary within the limits of the same species.

Reichenau, W. v. Zur Physiognomie des Mainzer Sandes. JB. nass. Vér. xxxv. pp. 21–61.

Includes notes on the insects of the locality, as observed at different seasons.

Reuter, O. M. Entomologiska Meddelanden från Societas pro Fauna et Flora Fennica Sammanträden Aren, 1880 och 1881. Ent. Tidskr. iii. pp. 153–156.

Riley, C. V. Report of the Entomologist for the Fiscal Year ending June 30, 1882. Washington: 1882, 8vo, pp. 167, pls., col. & plain, 20. (From Ann. Rep. Dep. Agric. 1882, pp. 63–164.)

The original pagination will here be indicated.

Sajó, K. Entomologische Bilder aus den ungarischen Flugsandsteppen. II. Sommerbild. Ent. Nachr. viii. pp. 1–10. [*Cf.* Ent. M. M. xix. pp. 70 & 71.]

Schaufuss, L. W. Zoologische Ergebnisse von Excursionen auf den Balearen. III. Addenda und Fortsetzung. Nunq. Ot. iii. pp. 527–552.

Includes *Coleoptera* and *Orthoptera*, besides *Crustacea*, *Mollusca*, and *Spongia*.

Slater, J. W. On the Sense of Smell in Insects. J. Sci. (3) iv. pp. 266–274.

The author argues from observation and experiment that this sense resides in the antennæ.

Sordelli, S. C. F. Sopra alcuni insetti fossili di Lombardia. Rend. Ist. Lomb. (2) xv. pp. 129–140, woodcuts; Bull. Ent. Ital. xiv. pp. 224–235, woodcuts.

Relates to *Libellula eurynome*, Heer, *Ophion* (?) sp., *Donacia* sp., and *Dytiscus zersi*, sp. n.

Swinton, A. H. A Physiological Arrangement of Insects. Canad. Ent. xiv. pp. 111–113.

Comments by Grote, *op. cit.* pp. 134 & 135.

Taschenberg, E. Die Insecten nach ihrem Schaden und Nutzen. Leipzig: 1882, 8vo, pp. 360, 70 woodcuts.

[*Cf.* Nature, xxvii. p. 172; Zool. Gart. xxiii. p. 288; Kosmos, vi. p. 400.]

Viallanes, H. Recherches sur l'histologie des Insectes, et sur les phénomènes histologiques qui accompagnent le développement post-embryonnaire de ces animaux. Bibl. École, xxvi. No. 3, pp. 348, pls. xviii.; Ann. Sci. Nat. xiv. 1, pp. 348, pls. iv.

This important work treats of the following subjects:—Part 1. Tissues of the larva and imago. Integuments of the larva; peripheral nervous system; sensitive nerve-terminations in larvæ of *Stratiomyia*, *Musca*, and *Eristalis*: involuntary striated muscles (dorsal vessel, digestive tube, and nerve-terminations of involuntary muscles); voluntary striated muscles

(in larva, and in legs and wings of imago); nerve-terminations in striated voluntary muscles (in larvæ of *Stratiomyia* and *Tipula*, and also in *Eristalis* and *Dytiscus*). Part 2. Phenomena of the histolysis, or destruction of larval tissues and systems. Bibliography; blood of larva at time of metamorphosis; histolysis of muscles, adipose tissue, salivary glands, and tracheæ; remarks on nuclei and other problematic formations; dessication and shedding of larval hypodermis. Part 3. Phenomena of histogenesis, or formation of tissues, &c., in the imago; development of segments of head, thorax, and abdomen, and of the muscular system, especially of the wings and legs; development of the visual apparatus.

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Notes (chiefly unimportant) on various *Hemiptera*, *Neuroptera*, *Diptera*, *Lepidoptera*, and *Hymenoptera*.

Walker, J. J. Entomological collecting on a voyage in the Pacific. Ent. M. M. xix. pp. 22–28.

Notes made on landing at various places on the West Coast of South and Central America.

Wood, J. G. Common British Insects. Selected from the Typical Beetles, Moths, and Butterflies of Great Britain. London: 1882, pp. 284.

A popular work. [*Cf.* Nature, xxvii. pp. 124 & 125.]

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[*Cf.* Zool. Gart. xxiii. pp. 159 & 160.]

Physiology, Habits, &c.

Stainton reprints the entomological observations scattered through Darwin's "Journal of Researches into the Natural History and Geology of the countries visited during the voyage of H.M.S. 'Beagle' round the world"; P. E. Soc. 1882, pp. xxxiv.–xlvii.

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On the vitality of Insects in various gases: Gratacap, Am. Nat. xvi. pp. 1019 & 1020.

Hibernating Insects; Margagli, Giorn. Nat. 1882, No. 1; (*cf.* Rev. d'Ent. i. pp. 117 & 118.)

Notes on fungi which attack Insects; Worthington J. Smith, Ent. M. M. xviii. p. 263.

On the nervous system of Insects of various Orders; Brandt, Troudy Ent. Ross. xii. pp. x.–xiii.

Weismann's paper on the development of the eggs of Insects reviewed by Emery; Biol. Centralbl. ii. pp. 558–560.

Adolph's papers on the wings of Insects reviewed; *id. l. c.* pp. 615–617.

On the wing-muscles in Insects of various Orders; Poletaeff, Troudy Ent. Ross. xiii. pp. 19–30.

On the resemblance between Insects inhabiting saline districts inland and on the coast; Dubois, Bull. Soc. L. Nord Fr. v. pp. 7–9.

On retarded development in Insects; Riley, Rep. E. Soc. Ont. 1881, pp. 11 & 12; P. Am. Ass. xxx. pp. 270 & 271.

Notes on plants and Insects; Schr. Ges. Danz. (2) v. 3, pp. 36–42; Kosmos, xi. pp. 294 & 295; Bull. Soc. L. Brux. ix. pp. 143–158, woodcut; J. Northampton Soc. i. pp. 243–248; Nat. Canad. xiii. pp. 191, 192, 221–224, & 269–273.

Note on Insectivorous Plants in Edinburgh Botanic Gardens; Owen, Gard. Chron. (2) xvi. [1881] p. 347.

Dioschidia rafflesia is not an insectivorous plant; Kosmos, xi. p. 374.

Local Faunæ and Observations.

Notes on garden-insects observed in 1882; Douglas, Ent. M. M. xix. pp. 117–119.

Report of the Entomological Section, Yorkshire Naturalist's Union, 1881; Wrigglesworth, Naturalist, vii. pp. 157–163.

Notes on rearing and collecting *Lepidoptera* and *Coleoptera* in Norfolk; Norgate, Tr. Norw. Soc. iii. pp. 383–385.

Undetermined gall on *Acronychiæ*; Gard. Chron. (2) xviii. p. 407, fig.

Notes on the Insects of Hyères, with lists of the more interesting *Lepidoptera*, *Coleoptera*, and *Odonata*; Denis, Hyères, pp. 592–602.

On collecting *Lepidoptera* and *Coleoptera* in the Pyrenees; Struve, S. E. Z. xliii. pp. 393–405 & 410–429.

List of Insects and galls obtained during an excursion to Savoy; Van Segvelt, C. R. Ent. Belg. xxvi. pp. cxxxiii.–cxxxvi.

Migration of *Diptera* and *Neuroptera* (*Eristalis sylvarum*, Meig., *Melithreptus* (*Syrphus*) *lavandulæ*, Macq., and *Libellula scotica* in the Upper Engadine, in September, 1880; Eimer, S. E. Z. xliii. p. 260; J.H. Ver. Württ. xxxviii. pp. 105–115.

List of Insects of various Orders taken in Limburg; Maurissen, Snellen & Piaget, Tijdschr. Ent. xxv. pp. xx.–xxvii., cx.–cxx., cxxvi., & cxxxvii.–cxl.

Entomological Exhibition at Nuremberg; Doebner, S. E. Z. xliii. p. 527 & 528.

On collecting Insects near Dorpat; Sintenis, SB. Ges. Dorp. vi. pp. 420–422 & 425–428.

List of Insects, &c., observed during a tour in the East; F. A. Walker, L'Orient (London: 1882, 8vo), App. D, pp. 378–387.

General notes on Insects of Loango; Güssfeldt, Die Loango Expedition (Leipzig: 1882, 4to), iii. pt. ii. pp. 290–295.

Notes on insects of Madagascar; W. Deans Cowan, P. R. Phys. Soc. Edinb. 1881–82, pp. 144 & 145.

W. T. Blanford (Rep. Brit. Ass. li. p. 678), gives the following approximate estimate of the known *Arthropoda* of British India:—

Insecta		
	Coleoptera	4780
	Hymenoptera	850
	Lepidoptera	4620
	Diptera	500 (?)
	Rhynchota	650
	Neuroptera	350
	Orthoptera	350 (?)
		—— 12,100
Myriopoda		50 (?)
Arachnida		120
Crustacea		100 (?) 270
		—— 12,370

List of *Hymenoptera* (3), *Lepidoptera Heterocera* (3), *Diptera* (6), *Coleoptera* (2) *Neuroptera* (1), and *Arachnida* (1), collected by the Howgate Polar Expedition in 1878; Scudder & others, Bull. U. S. Nat. Mus. xv. [1879] pp. 159–161.

Unusually late appearance of Insects in Canada in the autumn of 1882; Fletcher, Canad. Ent. xiv. p. 218.

Notes on Insects of various Orders observed in Ontario in 1881; Harrington & Moffat, Canad. Ent. xiv. pp. 7–9, 57 & 58; Rep. E. Soc. Ont. 1881, pp. 25 & 26.

Abundance of Insects in New Jersey in 1880 (a very dry year); Lockwood & Riley, Am. Nat. xvi. p. 745.

Tropical Notes from Central America; Champion, Ent. M. M. xviii. p. 214.

Entomological notes (chiefly relating to *Orthoptera*), from Porto Allegre, Rio Grande, Brazil; Ent. Nachr. viii. pp. 156–162.

Character of the Entomological Fauna of New Zealand; Kosmos, xi. p. 289.

Economic Entomology.

Miss Ormerod's Manual noticed; Gard. Chron. (2) xvi. p. 152; J. Sci. (3) iv. pp. 208–214; Rep. E. Soc. Ont. 1881, pp. 35 & 36, woodcuts.

Notes on edible Insects; Failla-Tedaldi, Nat. Sicil. i. pp. 232–240.

Short notes on applied Entomology; Bull. Ent. Ital. xiv. pp. 207 & 208, 402–406.

Various notes relative to *Phylloxera*, *Nematus ribesii*, *Anthomyia beta*, *Crioceris asparagi*, wasps, ants, and other injurious insects, and the best means of destroying them are scattered through Gard. Chron.

Undetermined larva destructive to hop; Dodge, Canad. Ent. xiv. pp. 93–96.

Injurious Insects observed in Russia in 1879; Portchinsky, Hor. Ent. Ross. xvi. p. xiv.

On new Insects injurious to agriculture in America; Riley, P. Am. Ass. xxx. pp. 272 & 273.

On various means of destroying or driving away injurious Insects: Pyrethrum; Riley, Rep. Ins. 1882, pp. 76–87, pls. iii. & iv. Strong odours; Lintner & Riley, Am. Nat. xvi. p. 596. Carbolic acid; Cook, Rep. E. Soc. Ont. 1881, pp. 26 & 27. Yeast; Hagen, Canad. Ent. xiv. pp. 38 & 39. Vapour of tobacco-juice; Girard, Bull. Soc. Ent. Fr. (6) ii. p. clxii.

Bibliography.

Parts xi.–xv. of Waterhouse's "Aid to the Identification of Insects" have appeared within the year, including vol. i. pp. 16, pls. lxxxiv.–c., and vol. ii. pls. ci.–cxxiv. The text includes title-page, index, and remarks on various species figured in vol. i.

On the North American Insects figured by Petiver; Hagen, Canad. Ent. xiv. pp. 11–13.

Entomological contents of "Centralblatt für das gessammte Forstwesen"; Ent. Nachr. viii. pp. 165–169.

Notes on sacred Insects; Failla-Tedaldi, Nat. Sicil. ii. pp. 64–68.

Obituary notice of J. Putzeys, with list of his works; De Borre, Ann. Ent. Belg. xxvi. pp. i.–viii.

Collecting, preserving, &c.

Suggestions to young entomologists; Dubois, Feuill. Nat. ii. pp. 131 & 132.

Mc.Lachlan advocates the universal employment of millimetres instead of inches and lines in measuring Insects; Ent. M. M. xviii. pp. 205–207 (*cf.* also Douglas & Mc.Lachlan, *l. c.* pp. 236–238).

On the preparation of Insects of various Orders; Van der Wulp, Tijdschr. Ent. xviii. pp. xviii. & xix.

Cheap Entomological Cabinet; Blatch, Rep. Birm. Soc. 1880, pp. 50 & 51, pl. xi.

Use of naphthaline in collections; Ent. xv. pp. 165 & 166, 240, 263 & 264; Am. Nat. xvi. pp. 409 & 410.

Suggestions for marking exchange lists; Fauvel, Rev. d'Ent. i. pp. 118 & 119.

COLEOPTERA.

BY

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

THE GENERAL SUBJECT.

BRANDEN, C. VAN DEN. Revue Coleopterologique. Livr. i.-iv. Bruxelles : 1882, 8vo, pp. 1–64.

A small monthly journal (discontinued) containing a bibliography of recent publications, lists of new species described in it, synonymic notes, obituary notices, &c., but little or no original matter.

CHALANDE, J. De la sensibilité chez les insectes aveugles cavernicoles. Bull. Soc. Toulouse, xv. pp. 126–130.

The writer's observations on blind genera of beetles (*Anophthalmus*, &c.), lead him to the conclusions of Piochard de la Brulerie, who considers that their sensibility resides in their hair or down, and is proportioned to the amount of this covering. They are less exclusively cave-frequenting insects than has been supposed.

MARSEUL, S. A. Nouveau Repertoire contenant les descriptions des espèces des Coléoptères de l'ancien-monde publiées isolement ou en langues étrangères en dehors des Monographes ou Traités spéciaux et de l'Abeille. ii. L'Ab. 1882, pp. 1–168.

Includes *Hydrocanthaires* and a portion of *Palpicornes*.

——. Catalogue des Coléoptères de l'Ancien-Monde. L'Ab. 1882, pp. 1–72.

Extends to *Feroniidæ*.

REITTER, E. Versuch einer systematischen Eintheilung der Clavigerinen und Pselaphiden. Verh. Ver. Brünn, xx. pp. 177–211.

Consists partly of a subdivision of the two families into numerous sections and sub-sections, under which the various genera are tabulated, and partly of a full bibliography of the genera.

SAHLBERG, J. Synonymiska anmärkningar till nordiska *Coleoptera*. Ent. Tidskr. iii. pp. 187–190, 206–208.

Corrections of synonymy of 42 species (chiefly *Carabidæ*, *Dytiscidæ*, and *Staphylinidæ*), enumerated by Mäklin from N. Norway, Novaya Zemlya, Waigatz Island, and the Yenissei.

Habits, Transformations, &c.

[redacted]important paper on the eggs of *Coleoptera*; Rupertsberger, Natur und Offenbarung, xx. pp. 385–397, 433–442; translated, Rev. d'Ent. i. pp. 154–161, 169–179.

Transformations of 70 *Coleoptera* described; Rosenhauer, S. E. Z. xliii. pp. 3–32, 129–171.

Notes on *Coleoptera* described in CR. Ent. Belg., and Bull. Soc. Ent. Fr., Ganglbauer, Wien. E. Z. i. pp. 182–184.

On the dispersion of *Coleoptera* after the Glacial Epoch; Leconte, Tr. Am. Ent. Soc. ix. pp. xxxv. & xxxvi.

Short notes on 12 *Coleoptera*; Schaufuss, Bull. Soc. Ent. Fr. (6) ii. pp. lxxxiv. & lxxxv.

Coleoptera inhabiting an old lime tree; Tholin, Feuill. Nat. ii. p. 62.

On fungus-feeding beetles; Harrington, Rep. E. Soc. Ont. 1881, pp. 22–25.

Larva of a beetle attacking a worm; Lawrence & others, Nature, xxvi. pp. 549 & 574.

Note on Coleopterous larvæ and their Hymenopterous parasites; Fromont, CR. Ent. Belg. xxvi. p. cv.

On woodboring *Coleoptera*; Riley, Am. Nat. xvi. pp. 823 & 824.

Variation of size in beetles; Dohrn, S. E. Z. xliii. pp. 472 & 473.

Influence of the size of elytra on the flight of beetles; G. Lewis, Ent. M. M. xviii. pp. 213 & 214.

On the similarity of outline in various genera of *Syntcliidæ*, *Lucanidæ*, and *Histeridæ*; id. P. E. Soc. 1882, p. xxii.

Collecting, Preservation, and Classification.

Hints on the collection and preservation of *Coleoptera*; Broun, N. Z. J. Sci. i. pp. 9–12, 49–51.

On collecting myrmecophilous *Coleoptera* in winter; Bull. Soc. L. Nord Fr. v. pp. 212–214.

Sulphur matches recommended for killing *Coleoptera*; Raoult, Rev. d'Ent. i. pp. 68–70.

On the preparation and packing of *Coleoptera*; Katter, Ent. Nachr. viii. pp. 250–253.

On cleaning and mounting small beetles; Rossi, *op. cit.* pp. 10–12.

Von Heyden animadverts on some of Des Gozis's proposed alterations in the generic names of *Coleoptera*; Bull. Soc. Ent. Fr. (6) ii. pp. xiii. & xiv. Reply by Des Gozis; *l. c.* pp. xxxiii. & xxxiv. (*cf.* also Reitter, Deutsche E. Z. xxvi. p. 296).

Reitter protests against the unnecessary multiplication of names for varieties of *Coleoptera*; Wien. E. Z. i. pp. 65–67.

Europe.

Heyden, L. von. Fünfzig Ergänzungen und Bemerkungen zum Catalogus Coleopterorum Europæ. Deutsche E. Z. xxvi. pp. 153 & 154.

Chiefly consists of brief notes on localities.

Reitter, E. Bestimmungs-Tabellen der europäischen Coleopteren [illegible]. Enthaltend die Familien: *Colydiidæ*, *Rhysodidæ*, *Trog[illegible]æ*. Verh. Ver. Brünn, xx. pp. 113–149.

The first and last of these families are divided into numerous sections and sub-sections, for which the paper itself must be consulted.

British Isles.

Fowler, W. W. Notes on new British *Coleoptera* since 1871, with notices of doubtful species, and of others that require to be omitted from the British list. Ent. M. M. xix. pp. 121–126, 167 & 168.

Extends to *Staphylinidæ*.

——. Natural localities of British *Coleoptera*. Ent. xv. pp. 60–64, 75–78, 107–110, 121–125, 149–152, 176–179, 199–204, 229–233, 246–250, & 265–268.

Includes hints on preserving, and on the best means of working different kinds of localities.

Pascoe, F. P. The Student's List of British *Coleoptera*, with synoptic tables of the families and genera. London: 1882, sm. 8vo, pp. viii. & 120. [*Cf.* Ent. M. M. xiv. pp. 46, 47 & 72; Ent. xv. pp. 142 & 143; Ann. N. H. (5) x. pp. 170 & 171.]

The nature of this work is sufficiently explained by the title. In the preface the author dissents from pushing the law of priority to extremes. The book closes with an index of genera.

Additions to list of *Coleoptera* of the Liverpool district; Ellis, Naturalist, vii. pp. 105–110.

Captures of *Coleoptera* at Hastings, Collett, Ent. M. M. xviii. pp. 234 & 235; at Lincoln and Margate, Fowler & Wood, *tom. cit.* pp. 277 & 278; at Hunstanton, Blatch, *op. cit.* xix. pp. 138 & 139; at Ventnor, Fowler, *tom. cit.* pp. 160 & 161; at Polegate, Goldthwaite & Clark, Ent. xv. p. 234.

France.

Bedel, L. Faune des Coléoptères du bassin de la Seine et de ses bassins sécondaires. Sous-Ordre *Rhynchophora*. Ann. Soc. Ent. Fr. (6) ii. (sep. pag.) pp. 1–32, plate.

The author admits 5 principal families, *Platyrrhinidæ*, *Nemonychidæ*, *Curculionidæ*, *Scolytidæ*, and *Platypodidæ*, which are again divided into subfamilies and tribes. The present instalment extends to the table of tribes of *Brachyrrhinidæ*, treated as the second subfamily of the *Curculionidæ*.

Fairmaire, L. Histoire naturelle de la France. 8 Partie, Coléoptères. Paris: 1882, 8vo, pp. 381, pls. 27, & figs.

Fauvel, A. Faune Gallo-Rhénane ou Species des Insectes qui habitent la France, la Belgique, la Hollande, la Luxembourg, la Prusse Rhénane, le Nassau, et la Valais, avec tableaux synoptiques et planches gravées. Coléoptères. Tome ii. pp. 1–84, pls.

Published as a supplement to Rev. d'Ent. The part issued in 1882 includes *Cicindelides* and *Carabides* as far as *Elaphrus*.

Additions to the list of *Coleoptera* of N. France : Bull. Soc. L. N. Fr. v. pp. 21–26, 45–47, 68–71, 86–88, 149–154, 245–248, 324–327, 337–341.

[illegible]net continues his Catalogue of the *Coleoptera* of Languedoc from *Heterocerida* to *Buprestidæ*. Bull. Soc. Toulouse, xvi. pp. 129–178.

Catalogue of the *Coleoptera* of Allier (*Cicindelidæ—Parnidæ*); Olivier, Bull. Soc. d'Agric. d'Allier, 1880 (*cf.* Rev. d'Ent. i. pp. 191 & 192).

Captures of *Coleoptera* in various parts of France, Bull. Soc. Ent. Fr. (6) ii. pp. clxiii. & clxiv.; at Rouen, Paris, Hyères, Var, Gard, and Grand-du-Roi, Feuill. Nat. ii. pp. 32, 33, 93, 97, 119–122, 142–144; in S. France, Toulon, and Hyères, Rev. d'Ent. i. pp. 41–44, 65–68, 140, 141, 164–167, 189–191, 23, 115, 116, 142 & 143; at the Bay of Anthie, Bull. Soc. L. N. Fr. v. pp. 131–136.

Belgium.

De Borre, P. Matériaux pour la faune Entomologique de la province de Liége, 1ière et 2me centuries. Mém. Liége (2) ix. pp. viii., 22 & 29.

Extends to *Bembidium*.

De Borre continues his descriptive Catalogue of the *Coleoptera* of Bra[illegible]*ra* to *Copelatus*. Bull. Soc. L. Brux. x. pp. 103–128, [illegible]6, 221–236.

Additions to the list of Belgian *Coleoptera*; Donckier & De Borre, CR. Ent. Belg. xxvi. pp. lxxxi., cxvi., cxvii. & cxliv.

Captures of *Coleoptera* (chiefly *Carabidæ*) in Flanders; Morsevi & De Borre, *l. c.* pp. xcii.–xcvi.

Germany and Austria.

Naturgeschichte der Insecten Deutschlands, begonnen von W. F. Erichson, fortgesetzt von H. Schaum, G. Kraatz, H. v. Kiesenwetter, J. Weise, und E. Reitter. Erste Abtheilung. *Coleoptera*, 3ter Band, 2te Abtheilung, 1ste Lieferung, von E. Reitter (Berlin: 1882, 8vo, pp. vi, 1–198), 6ste Band, 1ste und 2te Lieferungen, von J. Weise (Berlin: 1882, 8vo, pp. 1–368). The portion by Reitter includes *Clavigeridæ*, *Pselaphidæ*, and *Scydmænidæ*, and that by Weise includes *Eupoda*, *Camptosomata* and *Cyclica*, as far as part of *Chrysomela*.

Westhoff, F. Die Käfer Westfalens, 2te Abth. Verh. Ver. Rheinl. xxxviii. Suppl. pp. 141–323.

Extends from *Lucanidæ* to *Corylophidæ*. Short notes on many species and varieties are given.

List of German *Clavigeridæ*, *Pselaphidæ*, and *Scydmænidæ* according to Reitter; Ent. Nachr. viii. pp. 270–273.

Short notes on new or little-known German *Coleoptera*; Von Heyden and others, Deutsche E. Z. xxvi. p. 128.

Notes on a few *Coleoptera* of the Ahr district; Fuss, Ent. Nachr. viii. pp. 31 & 32.

List of *Coleoptera* of Neviges; Rossi, Verh. Ver. Rheinl. xxxix. pp. 196–215.

Second Supplement to Von Heyden's list of the *Coleoptera* of Nassau and Frankfort; Buddeberg, JB. Nass. Ver. xxxv. pp. 62–87.

Kittel has continued his catalogue of Bavarian *Coleoptera* from *Rhizophagidæ* to *Scolytus*; CB. Ver. Regensb. xxxvi. pp. 94–96, 123–127, 155–159, 173–188.

Captures of *Coleoptera* at Ingersheim in Alsace; Claudon, Feuill. Nat. ii. pp. 106 & 107.

Additions to the *Coleoptera* of Austria; Ganglbauer, Wien. E. Z. i. pp. 85–88, 118–120.

Additions to the *Coleoptera* of Silesia; Letzner, JB. schles. Ges. lix. pp. 347–349.

Sixth supplementary list of the *Coleoptera* of Tyrol; Gredler, Z. Ferd. (3) xxvi. pp. 205–238. About 150 species are added.

Captures of *Coleoptera* in Gallicia in 1880; Lomnicki, Sprawozd. Kom. fizyogr. xvi. pp. 244–254.

Italy.

Fiori, A. Saggio di un Catalogo del Coleotteri del Modenese e del Reggiano. Ann. Sci. Mod. (2) xv. pp. 61–100.

213 species of *Cicindelidæ* and *Carabidæ* enumerated.

Pirazzoli, O. Nozioni elementari intorno ai Coleotteri italiani. Imola: 1882, 8vo, pp. 212.

An introductory work. (*Cf.* Bull. Ent. Ital. xiv. pp. 391 & 392.)

Notes on Sicilian *Coleoptera*; Baudi, Nat. Sicil. i. pp. 83–88, 115–120, 127–131, & 274–278.

List of *Coleoptera* collected at Lago di Leontini; Ragusa, *op. cit.* pp. 282 & 283.

Spain and Portugal.

Oliviera, M. P. d'. Catalogue des Insectes du Portugal. Rev. Soc. Porto, ii. pp. 37–44, 94–101, 147–155, 232–240, 307–316, 366–374, 416–423, 468–475, 495–502, 593–601.

Extends to *Berosus*. A few new species are described; also one or two apparently described by the author in 1876 in a journal published at Coimbra.

List of *Coleoptera* collected by A. E. Eaton in Portugal; Bates & Sharp, Ent. M. M. xviii. pp. 230–233.

List of *Coleoptera* captured in the Sierra de Cordoba, Andalusia, with descriptions of several new species; Von Heyden, Deutsche E. Z. xxvi. pp. 43–48.

Greece.

On collecting *Coleoptera* at Athens; Brenske, Ent. Nachr. viii. pp. 81–83.

Africa.

Kersch, F. Verzeichniss der von Dr. Falkenstein in Westafrika (Chinchoxo) gesammelten Chrysomeliden, Endomychiden, Coccinelliden, und Anthrotribiden. B. E. Z. xxvi. pp. 395–403, pl. iv.

69 species enumerated, many new.

Raffray, A. Distribution geographique des Coléopterès en Abyssinie. C. R. xciv. pp. 746–748. [*Cf.* also Bull. Soc. Ent. Fr. (6) ii. pp. v. & vi.]

Four regions of distribution recognized:—1. Littoral zone from the level of the sea to 700 or 800 metres; (2) Zone of the valleys and low plains of the interior, from 1200–2000 metres, average altitude 1400 metres; (3) Zone of the plateaux from 2000–2800 metres, average altitude 2000–2500 metres; (4) Subalpine zone from 3300 to 4000 metres, average altitude 3500 metres. The general characteristics of the *Coleoptera* of each zone and the principal genera are briefly indicated.

Révoil, G. Faune et Flore des Pays Çomalis (Afrique Orientale). Paris: 1882, 8vo. Coléopterès recueillis par G. Revoil chez les Çomalis. Descriptions par L. Fairmaire, Von Lansberge, et Bourgeois, pp. 104, pl. i.

Nearly all the species enumerated are described as new. Many of them are also described in CR. Ent. Belg. xxvi.

List of *Coleoptera* captured by Burdo in Zanzibar, with descriptions of new species; Fairmaire, CR. Ent. Belg. xxvi. pp. xliii.–lviii.

Asia.

Heyden, L. von, & Kraatz, G. Käfer um Margelan, gesammelt von Haberhauer. Deutsche E. Z. xxvi. pp. 99–118.

166 species enumerated, often with short notes; 13 are described as new.

——. Käfer um Samarkand, gesammelt von Haberhauer. *L. c.* pp. 297–338.

199 species noticed, of which 59 are new or otherwise of special interest. The number of species of *Lethrus* and *Prosodes* is remarkable.

Lewis, G. On a visit to Ceylon, and the relation of Ceylonese beetles to the vegetation there. Tr. E. Soc. 1882, pp. 475–483.

The author obtained 10,000 specimens of about 1200 species in about five months, and discusses the climate and vegetation, and the various localities which he found to be inhabited by *Coleoptera*. Ceylon does not seem to be sufficiently isolated to possess many distinct or peculiar species, and still less any special or endemic forms. There was a total absence of *Necrophaga*, whose function as scavengers appears to be fulfilled by ants in Ceylon.

[Ritsema, C.] In P. J. Veth's "Midden Sumatra," Sect. iv. Natuurlijke Historie, Pt. vi. Coleoptera door verschillende Specialiteiten bewerkt en tot een geheel bijeengebracht door C. Ritsema Cz. (Leiden: 1882) pp. 1–72, pl. i.

Extends to the *Telephoridæ*. Includes short notes on various known

species. Many species previously described in Notes Leyd. Mus. are here redescribed. The figures on the plate represent *Dytiscidæ* and *Gyrinidæ*; but as there is no reference to them in the text, they cannot be quoted here.

Australian Region.

Broun, T. On the New Zealand *Carabidæ*. N. Z. J. Sci. i. pp. 193, 194, 215–227, 287–298.

The word *Carabidæ* has been erroneously used in the last paper for *Coleoptera*. Several species supplementary to Broun's work are described, from *Cnemacanthidæ* to *Byrrhidæ*.

Fauvel, A. Les Coléoptères de la Nouvelle-Caledonie et dépendances, avec descriptions, notes et synonymes nouvelles. Rev. d'Ent. i. pp. 217–236, 241–261, & 265–274.

The portion now published includes only the *Cicindelidæ* and *Carabidæ*.

North America.

Henshaw, S. Index to the *Coleoptera* described by J. L. Leconte; Tr. Am. E. Soc. ix. pp. 197–272.

Notes on various American *Coleoptera*; Shorten, J. Cincinn. Soc. v. pp. 61 & 62. Habits; Leconte, Tr. Am. E. Soc. ix. pp. ii., iii., xxi., xxii. & xxxvi.

List of *Coleoptera* collected in 1880 in Manitoba and between Lake Winnipeg and Hudson's Bay; Bell (quoting Leconte), in Selwyn's Rep. Geol. & N. H. Survey of Canada, 1879-80 [Montreal: 1881], pp. 70*c*–74*c*.

Captures of rare *Coleoptera* in Canada; Bell, Rep. E. Soc. Ont. 1881, p. 28.

List of 7 *Coleoptera* which attack clover in the United States; Webster, Am. Nat. xvi. p. 746.

Additional list of *Coleoptera* of Buffalo; Bull. Buff. Soc. iv. p. 55. Of Cincinnati; Dury, J. Cincinn. Soc. v. pp. 218–220. Captures in Kentucky; Siewers, *op. cit.* p. 96.

Cicindelidæ.

(*Cf.* also Carabidæ.)

Platychile pallida, Fabr., noticed; Deyrolle & Lucas, Bull. Soc. Ent. Fr. (6) ii. pp. cxliii., cxliv. & clviii.

Amblychila piccolominii, Reiche, = *cylindriformis*, Say; Horn, Tr. Am. Ent. Soc. x. p. iv.

Megacephala recoili, Lucas, redescribed and figured; Révoil, Faune et Flore Çomal. *Col.* p. 3, pl. i. fig. 1.

Cicindela hybrida, *sylvatica*, and *campestris* noticed; Schriever, JB. Westf. Ver. x. pp. 10 & 11. *C. hurmeisteri*, Fisch., var. *punctata* from Turkistan described; Dokhtouroff, Rev. d'Ent. i. p. 216. *C. litterata* noticed; Honnorat, Feuill. Nat. ii. p. 98. *C. juliæ*, Ball., is hardly distinct from *kirilovi*, Fisch.; Kraatz, Deutsche E. Z. xxvi. pp. 255 & 256. *C.*

maracandensis, Solsky, probably = *turkestanica*, Ballion, var.; Dokhtouroff, Rev. d'Ent. i. p. 215.

Fata, Fauvel [*cf.* Zool. Rec. xviii. *Ins.* p. 25], characterized by him, Rev. d'Ent. i. p. 221.

Caledonica deplanchii, Fauv., is distinct from *mniszechi*, Thoms.; Dohrn, S. E. Z. xliii. p. 363.

Dilatotarsa, Dokhtouroff, Hor. Ent. Ross. xvii. p. 13, Rev. d'Ent. ii. p. 113. Intermediate between the *Cicindelini* and *Ctenostomidæ*; type, *D. bigranifera*, sp. n., *l. c.* p. 14, Mindoro. (Renamed *Eurytarsa*; id. Rev. d'Ent. i. p. 276.)

New species :—

Tetracha morsii, Fairmaire, CR. Ent. Belg. xxvi. p. xliv., Zanzibar.

Cicindela burmeisteri (? = *balassogloi*, var.), p. 215, *gabonensis*, Gaboon, p. 216, *elegantula*, Cochin China, p. 261, *bramani*, East Indies, p. 262, *lucasi*, New Guinea, p. 274, *solskii*, *fauveli*, Malacca, p. 275, *elaphroides*, Manilla, and *pretiosa*, Amazons, p. 276, Dokhtouroff, Rev. d'Ent. i.; *C. cinctella*, Chevrolat, Le Nat. ii. p. 93, Andamans; *C. blanchardi*, pl. i. fig. 2, and *somalia*, Fairmaire in Révoil, Faune et Flore Çomal. *Col.* pp. 4 & 5, Somali-land; *C. viridis*, Raffray, Bull. Soc. Ent. Fr. (6) ii. p. xlvii., Abyssinia; *C. euthales* and *nephelota*, Bates, Ann. N. H. (5) ix. p. 319, Mexico.

Caledonica bavayi and *myrmidon*, Fauvel, Rev. d'Ent. i. pp. 225 & 226, Kanala, &c.

Dromica revoili, Fairmaire, *l. c.* p. 6, Somali-land.

Carabidæ.

Des Gozis, —. Mémoire sur les pores sétigères prothoraciques dans la tribu des Carnivores. MT. schw. ent. Ges. vi. pp. 285–300.

The types recognized by the author are as follows:—

I. Thorax with no setigerous pores on the lateral border, nor on the middle, nor towards the hinder angle (*Oodidæ*, *Zabridæ*, *Homophronidæ*, *Drypta*, and *Odacantha*).

II. A single setigerous pore on the thorax, at the lateral edge and a little before the middle, none at or near the hinder angle (*Notiophilidæ*, *Brachynidæ*, and *Harpalidæ*).

III. Thorax with from six to ten setigerous pores along the whole lateral edge, irregularly placed but at nearly equal distances, that in the middle generally distinguished by the length of its thread (*Panagæidæ*, *Ditomidæ*, *Apotomidæ*).

IV. Thorax with no setigerous pore in front or towards the middle, but with one at or a little in front of the hinder angle at about one quarter or one third of its height (*Chlæniidæ*).

V. Thorax with a setigerous pore about the middle of the sides and another at or before the hinder angle (sometimes also two or three others between the front angle and the middle). Most of the remaining families fall into this division, but exhibit some peculiarities which are noticed in detail.

VI. Three pores on each side regularly arranged in front of the lateral edge (*Nomiidæ*).

HORN, G. H. On the genera of *Carabidæ*, with special reference to the fauna of Boreal America. Tr. Am. E. Soc. ix. pp. 91–196, pls. iii.–x. [*Cf.* CR. Ent. Belg. xxvi. pp. lx.–lxxiii.; also Dohrn, S. E. Z. xliii. pp. 237, 243, 301–306.]

The arrangement of *Adephaga*, and of the families, subfamilies, and tribes of *Carabidæ* proposed is as follows:—CICINDELIDÆ, CARABIDÆ (CARABINÆ: *Omophronini, Trachypachini, Cychrini, Carabini, Pamborini, Hiletini, Elaphrini, Loricerini, Nebriini, Migadopini, Metriini, Mystropomini, Promecognathini, Enceladini, Scaritini.* HARPALINÆ: HARPALINÆ BISETOSÆ: *Panagæini, Siagonini, Ozænini, Nomiini, Psydrini, Morionini, Bembidiini, Pogonini, Pterostichini, Licinini, Platynini, Anchonoderini, Ctenodactylini, Odocanthini, Dryptini, Mormolycini, Agrini, Egini, Lebiini, Helluonini, Graphipterini, Anthiini, Cratocerini, Orthogonini.* HARPALINÆ UNISETOSÆ: *Brachynini, Apotomini, Broscini, Zacotini, Peleciini, Chlæniini, Zabrini, Harpalini.* PSEUDOMORPHINÆ), HALIPLIDÆ, AMPHIZOIDÆ, PELOBIIDÆ, DYTISCIDÆ, and GYRINIDÆ. Only the *Carabidæ* are discussed in detail; but the general structure of the other families is also noticed. The plates chiefly represent the mentum, appendages, and maxillæ of the various genera. The first two plates represent under-surfaces and whole figures.

LEWIS, G. [See *Insecta*, General Subject.]

SHARP, D. On the Classification of the *Adephaga*, or carnivorous series of *Coleoptera*. Tr. E. Soc. 1882, pp. 61–71. [*Cf.* S. E. Z. xliii. pp. 486–488.]

Consists of an analysis of recent papers by Horn and Kolbe. The author proposes to treat *Mormolyce* as an isolated family intermediate between the *Carabidæ* and *Dytiscidæ*.

On the classification of the *Carabinæ* and *Harpalinæ*, with lists of Belgian species; De Borre, Ann. Soc. L. Brux. x. pp. 236–239.

On the frequent occurrence of projecting shoulders in marsh-frequenting *Carabidæ*; Flach, Deutsche E. Z. xxvi. p. 253.

Voracity of *Carabidæ*; Riveau, Feuill. Nat. ii. p. 61. Short notes on various species; *id. l. c.* pp. 95 & 96.

Notes on the nervous system of the *Carabidæ*; Brandt, Troudy Ent. Ross. xii. pp. ix. & x.

Carabidæ eaten by frogs; Fowler, Ent. M. M. xviii. p. 188.

Captures of *Carabidæ* at Argenteuil; Feuill. Nat. ii. p. 101.

Homophronides.

Homophron variegatus, Géné, noticed; Costa, Rend. Acc. Nap. xxi. p. 195.

Homophron kanalense[*-sis*], sp. n., Fauvel, Rev. d'Ent. i. p. 219, Kanala.

Elaphrides.

Notiophilus bipunctatus and *quadripunctatus* noticed; De Borre, CR. Ent. Belg. xxvi. pp. lxxx. & lxxxi. *N. hirticollis*, Chaud., = *palustris*,

Duft. ; Von Heyden, Deutsche E. Z. xxvi. p. 254. *N. biguttatus*, Fabr., and *N. latelatus*, Wesm., noticed ; Everts, Tijdschr. Ent. xxv. pp. xvii. & xviii. *Elaphrus*. The comparative width of the prothorax indicated as a good specific character. Dohrn & De Borre, CR. Ent. Belg. xxvi. pp. lxxviii.–lxxx., woodcut.

Hiletides.

Hiletus fissipennis, sp n., Ancey, Le Nat. ii. p. 54, Zanzibar.

Carabides.

Nebria. Notes on Sicilian species ; De Borre & Ragusa, Nat. Sicil. i. pp. 179–182. *N. brevicollis* with monstrous elytra ; Letzner, JB. schles. Ges. lix. pp. 354 & 355. *N. sabina*, Fabr., = *brevicollis*, var. ; Schaufuss, Nunq. Ot. iii. p. 560. *N. brevicollis*, Fabr., var. *iberica* from Portugal noticed ; Oliviera, "Instituto, 1876, Coimbra, p. 230" ; Rev. Soc. Porto, ii. p. 101.

Carabus nordmanni, Chaud., and allies are discussed by Schaufuss, Nunq. Ot. iii. pp. 513–527. He enumerates the following forms:—*C. spinolæ*, Creutz. (= *bonplandi*, Mén.), *lamprus*, Chaud., *chalconotus*, Mannerh., *phædimus*, Schauf. (= *mniszechi*, Led., MS.), *nordmanni*, Chaud. (= *productus*, Hampe, = *robustus*, Deyr.), with varr. *triumphator* (p. 523), *perfectus*, *ducalis* (p. 524), *callipeplus*, *semirugosus*, and *extremus* (p. 525), and *stjernvalli*, Mannerh., with varr. *boschinakii*, *humboldi*, Fald., *bartholomæi*, Motsch., *raddeanus*, Schauf. (p. 526), and *enops*, Schauf. (p. 527). *C. violaceus*, Linn. (with var. *scaber* from Hesse, p. 556, *marginalis*, Fabr., *lusitanicus*, Fabr. (with varr. *descensus* and *medio-tuberculatus*, p. 557), and *C. bonvouloiri*, Chaud. (with varr. *clandestinus*, *nobilis*, and *foveicollis*, p. 558), and their varieties discussed, those noticed being apparently new ; *id. l. c.* pp. 556–558. *C. sapphirinus*, Crist., = *theophilii*, Deyr., *thoracicus*, Germ., = *scythus*, Motsch., *perforatus*, Fisch., is distinct ; *id. l. c.* p. 560. *C. cancellatus* and *nemoralis* : varieties noticed ; Schreevers, JB. Westf. Ver. x. p. 11. *C. antiquus*, Dej., var. *vieræ* from Portugal described ; *C. lusitanicus*, Dej., is also a variety of it ; Oliviera, Rev. Soc. Porto, ii. p. 96. *C. auratus :* specimens with malformed elytra noticed ; Kerremans & Jacobs, CR. Ent. Belg. xxvi. p. lxxiii. *C. auronitens*, Fabr., its varieties discussed and fully described ; Géhin, Le Nat. ii. pp. 4–8 ; Ent. Nachr. viii. pp. 41 & 42. *C. cancellatus*, Ill. (= *granulatus*, Fabr., *nec* Linn.), and var. *carinatus*, Charp., discussed ; Donckier, CR. Ent. Belg. xxvi. pp. viii.–x. *C. heydeni*, Brullé, discussed ; Oliviera, "Instituto, 1876, p. 176" ; Rev. Soc. Porto, ii. p. 99. *C. regalis* and *henningii*, Fisch., variation discussed, and the following varr. differentiated :—*C. regalis*, varr. *nigritulus*, *cyanescens*, *cyanicollis* (Stev., MS.), *viridicinctus*, *viridicollis*, Kraatz, and *cuprinus* and *pasianax*, Fisch. ; *C. henningii*, varr. *ruficornis*, *spurius*, and *unicolor*, Kraatz, and *sahlbergi*, Dej. ; *C. intricatus* and varieties discussed ; *C. lefeburii*, Dej., may be distinct : Kraatz, Deutsche E. Z. xxvi. pp. 197–201. *C. lefeburii*, var. from Calabria noticed ; Costa, Atti Acc. Nap. ix. (6) p. 42. *C. parreysi*, var. *gattereri* from Styria described ; Géhin, Rev. d'Ent. i. pp. 240 & 263. *C. punctato-*

auratus, Germ., and *nitens*, Linn.: Kraatz discusses their claims to be considered distinct; Deutsche E. Z. xxvi. pp. 125–127.

Damaster and *Carabus*. Notes on several Japanese species; Le[illegible], Tr. E. Soc. 1882, pp. 525–527.

Calosoma scrutator, Fabr., noticed; Hamilton, Rep. E. Soc. Ont. 1881, p. 29.

Callisthenes elegans, Kirsch, and *karelini*, Fisch., noticed; Dohrn, S. E. Z. xliii. pp. 247–249, 371 & 372.

New species :—

Nebria geraldesi, Oliviera, "Instituto, 1876, Coimbra, p. 230"; Rev. Soc. Porto, ii. p. 147, Portugal.

Carabus phædimus (= *mniszechi*, Kind., MS.), Asia Minor, and *sexpunctatus*, Batum; Schaufuss, Nunq. Ot. iii. pp. 520 & 526. *C. balassogloi*, p. 102, *regulus*, Thian-Shan, p. 104, *corrugis*, Issik-Kol, p. 249 (*cf.* also p. 104), Dohrn, S. E. Z. xliii. *C. forreri*, Bates, Ann. N. H. (5) ix. p. 320, Mexico. *C. wagæ*, Fairmaire, Ann. Soc. Ent. Fr. (6) ii. p. 65, N. India. *C.* (*Plectes*) *komarowi* and *C.* (*P.*) *lederi*, Reitter, Wien. E. Z. i. pp. 25 & 27, Caucasus.

Calosoma caraboides, Raffray, Bull. Soc. Ent. Fr. (6) ii. p. xlvii.; Gehin, Rev. d'Ent. i. pp. 208-210, Abyssinia.

Cychrides.

Cychrus caraboides, var. *sabaudus* from Savoy noticed; Fauvel, Faune Gallo-Rhénane, ii. p. 30.

Cychrus (*Sphæroderus*) *relictus*, Horn, Tr. Am. Ent. Soc. ix. p. 188, Washington Territory; *C.* (*Scaphinotus*) *mexicanus*, Bates, Ann. N. H. (5) ix. p. 320, Mexico : spp. nn.

Odontacanthides.

Casnonia maculicornis, Gory, = *rugicollis*, Dej.; Dohrn, S. E. Z. xliii. p. 250. *C. aliena*, Pasc., figured by Waterhouse, Aid, i. pl. xcii.

Ctenodactylides.

Pionycha maculata, Gory, variation noticed; Dohrn, S. E. Z. xliii. pp. 249 & 250.

Galeritides.

Zophium bocagii, sp. n., Oliviera, "Instituto de Coimbra, 1876, p. 235," Rev. Soc. Porto, ii. p. 153, Portugal.

Brachynides.

Pheropsophus liopterus, sp. n., Ancey, Nat. Sicil. ii. p. 69, Zanzibar.

*Brachynus bisignifer*us, sp. n., Costa, Atti Acc. Nap. ix. (6) p. 33, fig. 1, Calabria.

Brachynites truncatus, sp. n., Fritsch, Beitr. Pal. Oesterr.-Ung. ii. p. 5, pl. ii. fig. 3 (elytron from Bohemian Chalk).

Lebiides.

HORN, G. H. Synopsis of the species of the tribe *Lebiini*. Tr. Am. Ent. Soc. x. pp. 126–163.

The following genera are discussed:—*Tetragonoderus*, Dej., *Nemotarsus*, Lec., *Coptodera*, Dej., *Phloxena*, Chaud., *Dromius*, Bon., *Apristus*, Chaud., *Blechrus*, Motsch., *Metabletus*, Schmidt-Goebel, *Axinopalpus*, Lec., *Tecnophilus*, Chaud., *Euproctus*, Sol., *Callida*, Dej., *Philophuga*, Motsch., *Plochionus*, Dej., *Pinacodera*, Schaum, *Cymindis*, Latr., *Apenes* and *Eucærus*, Lec., *Pentagonica*, Schmidt-Goebel, and *Onota*, Chaud. The synonymy is too extensive to be quoted.

Variopalpus, Sol. (1849), = *Axinopalpus*, Lec. (1846); Leconte, *op. cit.* p. xxi.

Metabletus punctatellus, Duftschm., = *foveolatus*, Gyll.; *M. foveolatus*, Dej., renamed *dejeani*, Rouget, Le Nat. ii. pp. 87 & 88. The latter = *cupreus*, Waltl, Von Heyden, *op. cit.* p. 102.

Lionychus albo-notatus, Dej., varr. *bimaculatus* and *immaculatus* from Portugal, noticed; Oliviera, Rev. Soc. Porto, ii. p. 233. *L. sulcatus*, Chaud., noticed; Fairmaire, Ann. Soc. Ent. Fr. (6) ii. p. 68.

Lebia crux-minor recorded from Japan; Lewis, Ent. M. M. xviii. p. 188. *L. humeralis*, var. *lepida*, Brullé, noticed; Ragusa, Nat. Sicil. i. p. 226. *L. turcica*, Fabr., pupa noticed; Piccioli, Bull. Ent. Ital. xiv. pp. 141 & 142.

Mizotrechus novem-striatus and *Perigona lævigata*, Bates, figured by him; Biol. Centr. Am. *Col.* (1) i. pl. vi. figs. 2 & 4.

Ucea, g. n., Fauvel, Rev. d'Ent. i. p. 257. Intermediate between the *Cymindides* and *Dromiides*, type, *Philotecnus stigmula*, Chaud.

New species:—

Callida platynoides, Horn, Tr. Am. Ent. Soc. x. p. 139, California, Utah.

Xanthophæa limbata, *acutangula*, *obtusangula*, p. 255, and *truncata*, p. 256, Fauvel, Rev. d'Ent. i., New Caledonia.

Philophuga castanea, Horn, *l. c.* p. 144, California.

Cymindis heydeni, Oliveira, Rev. Soc. Porto, ii. p. 236, Portugal; *C. raffrayi*, Fairmaire, Le Nat. ii. p. 191, Abyssinia.

Pinacodera sulcipennis and *semisulcata*, Horn, *l. c.* p. 148, California.

Onota floridana, id. *l. c.* p. 159, pl. iv. fig. 4, Florida.

Dromidea longiceps and *cyanoptera*, Fauvel, *l. c.* pp. 253 & 254, New Caledonia.

Dromius putzeysi, Oliviera, "Instituto de Coimbra, 1876, p. 293," Rev. Soc. Porto, ii. p. 154, Portugal.

Amblystomus majoricensis, Balearic Islands, p. 545, *macedo*, Macedonia, and *ruficornis*, Sicily, p. 546, note, Schaufuss, Nunq. Ot. iii.

Masoreus ridiculus, id. *l. c.* p. 552, St. Thomas.

Perigona cordicollis, Bates, Biol. Centr. Am. *Col.* i. (1) p. 135, Guatemala, Nicaragua.

Plochionus dorsalis, Horn, *l. c.* p. 146, Florida.

Pericalides.

Coptodera hieroglyphica, sp. n., Fauvel, Rev. d'Ent. i. p. 258, New Caledonia.

Pentagonica atkinsoni, sp. n., *id. l. c.* p. 260, New Caledonia.

Scopodes venustus, *planus*, *tardus*, p. 226, and *pustulatus*, p. 227, Broun, N. Z. J. Sci. i. ; *S. nigrinus*, Sharp, Tr. E. Soc. 1882, p. 77 : all from New Zealand, spp. nn.

Pseudomorphides.

Silphomorpha africana, sp. n., Schaufuss, S. E. Z. xliii. p. 308, Abyssinia.

Ditomides.

Aristus capito, Dej., var. *obscuroides* from Portugal, noticed ; Oliviera, "Instituto de Coimbra, 1876, p. 167," Rev. Soc. Porto, ii. p. 416.

Aristus, sp. from Sardinia noticed ; Costa, Atti Acc. Nap. ix. (11) p. 31.

Graphipterides.

Graphipterus cineraceus and *soricinus*, spp. nn., Fairmaire in Révoil's Faune et Flore Çomal. *Col.* pp. 8 & 9, Somali-land.

Piezia parenthesis, sp. n., Dohrn, S. E. Z. xliii. p. 369, Zanzibar.

Anthiides.

Anthia megara and *revoili*, Lucas, redescribed ; Révoil's Faune et Flore Çomal. *Col.* pp. 9 & 10. *A. ferox*, Thoms. : variation in size noticed ; Lucas, Bull. Soc. Ent. Fr. (6) ii. p. xlvii. *A. helluonides*, Ancey, referred by him to *Acanthogenius* : Le Nat. ii. p. 54.

Anthia (*Polyhirma*) *ænigma*, Dohrn, *caillaudi*, Gory (= *polioloma*, Chaud.), and *leucospilota*, Bert., noticed ; Dohrn, S. E. Z. xliii. pp. 367 & 368.

Anthia burdoi, Fairmaire, CR. Ent. Belg. xxvi. p. xlv., Zanzibar ; *A. portentosa*, S. Africa, p. 246, *A.* (*Polyhirma*) *intricata*, p. 367, and *A.* (*P.*) *neonympha*, Zanzibar, p. 368, Dohrn, S. E. Z. xliii. : spp. nn.

Polyhirma pluricostata, Fairmaire, *l. c.*, Zanzibar ; *P. biloba*, id. Révoil's Faune et Flore Çomal. *Col.* p. 11, Somali-land : spp. nn.

Morionides.

Morio lafertei, Guér., *Moriosomus sylvestris*, Motsch., and *Catapiesis mexicana*, Chaud., figured ; Bates, Biol. Centr. Am. *Col.* i. (1) pl. iv. figs. 16, 19 & 17.

Catapiesinæ, subfam. n., Bates, *l. c.* p. 90. Differs from the *Cratocerinæ* by the truncate elytra. To include *Homalomorpha*, and *Catapiesis*, Brullé.

Catapiesis sulcipennis, sp. n., *id. l. c.* p. 90, Mexico.

Scaritides.

Pasimachus californicus, Chaud., = *validus*, Lec. ; Horn, Tr. Am. Ent. Soc. x. p. iv.

Reichia mirabilis, Putz., Saulcy (*nec* Mill.) = *frondicola*, Reitt.; Reitter, Wien. E. Z. i. p. 68.

Clivina and *Dyschirius* differentiated, and the sections of the former noticed; Horn, *l. c.* p. vii.

Adialampus, g. n., Des Gozis, MT. schw. ent. Ges. vi. p. 296. Allied to *Scarites*; types, *S. lævigatus, arenarius*, and *planus*.

Scarites granellus, sp. n., Fauvel, Rev. d'Ent. i. p. 230, New Caledonia.

Pamborides.

Tefius chaudoiri and *zebudianus*, spp. nn., Raffray, Bull. Soc. Ent. Fr. (6) ii. p. lxx., Abyssinia.

Panagæides.

Ditomus, Latr. (*nec* Bon.) = *Carterus*, Bed. (*nec* Dej.), renamed *Sabienus*; Des Gozis, MT. schw. ent. Ges. vi. p. 290.

Panagæus sallæi, Chaud., figured; Bates, Biol. Centr. Am. *Col.* i. (1) pl. iii. fig. 2.

Chlæniides.

Chaudoir, M. de. Monographie des Oodides. Ouvrage posthume. 1e & 2e parties. Ann. Soc. Ent. Fr. (6) ii. pp. 317–378 & 485–554.

Chlænius nigricornis, F., var. *melanocornis*, Dej., and *schranki*, Duftschm. Intermediate specimen noticed; Everts, Tijdschr. Ent. xxv. p. xviii. *C. tristis*, Schall., noticed; Ragusa, Nat. Sicil. i. p. 226. *C. menevillii, sallæi, ruficauda, planipennis, obscuripennis*, Chaud., *Stenous tibialis* and *Anatrichis piceus*, Motsch., figured; Bates, Biol. Centr. Am. *Col.* i. (1) pl. iii. figs. 3, 5, 7–11.

New genera and species:—

Oodiellus, Chaudoir, Ann. Soc. Ent. Fr. (6) ii. p. 323 (? = *Oodinus*, Motsch.). Allied to *Anatrichis*, but differs in the structure of the mouth; paraglossæ very large, slender, and adherent to the sides of the ligula to the extremity; the two joints of the lower lobe of the maxillæ are soldered together, although very distinct; and the last is much longer than in *Anatrichis*. To include *O. mexicanus*, Mexico, p. 323, *amazonus*, p. 324, *limbellus*, Amazons, *arechavaletæ*, Montevideo, Rio Janeiro, p. 325; spp. nn.

Polychætus, id. *l. c.* p. 338. Allied to *Systolocranius* and *Lachnocrepis*; type, *P. dejeani* (= *Oodes mexicanus*, Dej. Cat.), sp. n., *id. l. c.* p. 339, Cayenne.

Dercylinus, id. *l. c.* p. 525. Allied to *Ecolenes*, antennæ slender throughout, prothorax deeply sulcated at the sides; mentum differently formed. Type, *E. impressus*, Lec.

Dercylodes, id. *l. c.* p. 527. Allied to *Oodes*, but superficially resembling *Eurysoma*, front and prothorax sculptured as in *Dercylus*. To include *D. gibbosus, infernus* (= *ater*, Brullé), Laferté, *crenatus*, Schaum, *batesi*, Chaud., and *buckleyi*, sp. n., *l. c.* p. 531, Ecuador.

Melanodes, id. *l. c.* p. 545. Facies of *Abacetus* rather than of *Oodes*; to include *M. parallelus* (= *Pœcilus atratus*, Reiche, *nec* Klug). *Chlænius*

aterrimus, Laf., *Feronia atrata*, Klug, *Oodes ebeninus*, Erichs., and the following new species :—*M. iridescens*, Abyssinia, p. 548, *rectangulus*, Natal, N'gami, p. 549, *pernitidus*, Deccan, Rangoon, *subelongatus*, Deccan, p. 550, and *aberrans*, Natal, N'gami, p. 551.

Patellus, id. *l. c.* p. 551. Intermediate between *Melanodes* and *Feronia* ; type, *P. drimostoides*, sp. n., *l. c.* p. 553, Burma.

Simous, id. *l. c.* p. 573. Distinguished from *Oodes* by their brilliant metallic colours, as well as by structural characters. To include *O. mouhoti* and *lucidus*, Chaud., *nigriceps*, Wiedem., and *æneus*, Laferté.

Physomerus, id. *l. c.* p. 537. Allied to *Asporina* and *Evolenes* ; types, *P. tuberculatus* and *cordicollis*, spp. nn., *l. c.* pp. 538 & 539, Colombia.

Chlænius aberrans (= *martinezi*, fig. 4), Mexico, and *guatemalenus*, fig. 6, Guatemala, Bates, Biol. Centr. Am. *Col.* i (1) pp. 42 & 43.

Stenous gratiosus, id. *l. c.* p. 46, Mexico (*cf.* also Chaudoir, *infrà*, sub *Stenocrepis*).

Anatrichis alutaceus, Mexico, and *longulus*, Guatemala, *id. l. c.* p. 48 ; *A. indicus*, Deccan, p. 320, *pedinoides*, East Indies, p. 321, and *australasiæ*, Moreton Bay, p. 322, Chaudoir, *l. c.*

Thryptocerus politus, id. *l. c.* p. 337, Madagascar.

Systolocranius sulcipennis, Kordofan, *lucidulus*, p. 330, *elongatus*, p. 332, *brachymorphus*, Zanzibar, p. 333, and *alternans*, Delagoa Bay, Natal, p. 334, *id. l. c.*

Oodes schaumi, Louisiana (?), p. 346, *guineensis*, Guinea, p. 350, *varians*, Bengal, p. 352, *natalensis*, Natal, p. 357, *deplanatus*, Madagascar, *siamensis*, Siam, *vagabundus*, Zanzibar, p. 358, *centrosternis*, Senegal, p. 359, *lævissimus*, New Guinea, p. 361, *subcoriaceus*, Malacca, p. 362, *cœlestinus*, Sarawak, p. 363, *impressus*, Swan River, &c., p. 365, and *substriatus*, Natal, p. 372, *id. l. c.*

Stenocrepis chalcochrous[*-chroa*] (= *chalcas*, Bates), Mexico, p. 487, *sinuata*, Ega, p. 488, *angustipennis*, Demerara, p. 490, *viridula*, Upper Amazons, p. 493, *S.* (*Stenous*) *gratiosa* (Bates), Mexico, *S.* (*St.*) *guerini*, Bolivia, p. 500, *S.* (*St.*) *triarius*[*-ria*], Parà, p. 503, and *S.* (*St.*) *gilvipes* (= *pallipes*, Reiche, *nec* Brullé), Venezuela, New Granada, p. 504, *id.* l. c. ; *S. chalcas*, Bates, *l. c.* p. 47, pl. iii. fig. 12, Mexico.

Coptocarpus championensis, Champion Bay, p. 510, *gibbus*, Australia, and *oviformis*, Cape York, p. 511, Chaudoir, *l. c.*

Macroprotus forticornis, id. *l. c.* p. 543, Ega.

Eccoptomenus usagaræ, Ancey, Nat. Sicil. ii. p. 69, Usagara.

Hoplolenus cyllodinus, Fauvel, Rev. d'Ent. i. p. 266, New Guinea.

Licinides.

Badister unipunctulatus, var. *teutonoides* from Anderlecht, described, De Borre, CR. Ent. Belg. xxvi. p. xxxiii.

Dicælus flohri, sp. n., Bates, Biol. Centr. Am. *Col.* i. (1) p. 49, Mexico.

Cnemacanthides.

Metaglymma punctifer and *oblonga*, spp. nn., Broun, N. Z. J. Sci. i. pp. 215 & 216, New Zealand.

Mecodema rugicollis[*-le*], sp. n., *id. l. c.* p. 215, New Zealand.
Oopterus carinatus, sp. n., *id. l. c.* p. 224, New Zealand.

Craterocerides.

Agonoderus comma, *pallipes*, Fabr., *rugicollis*, Lec., and *Trachycellus* (*Brachycellus*) *atrimedius*, Say, differentiated; Hamilton, Canad. Ent. xiv. pp. 194–196.

Cratocerus sulcatus, Chaud., figured; Bates, Biol. Centr. Am. *Col.* i. (1) pl. iv. fig. 18.

Pogonodaptus, g. n., Horn, Tr. Am. Ent. Soc. ix. p. 178. Differs from *Daptus* and allies by its prominent and smooth mandibles, the non-fossorial tibiæ, the absence of scutellar striæ, and in the form of the ligula and paraglossæ. Type, *P. piceus*, sp. n., *id. l. c.* p. 179, Texas.

Amblygnathus mexicanus, sp. n., Bates, Biol. Centr. Am. *Col.* i. (1) p. 66, Mexico.

Anisodactylides.

Anisodactylus. Pubescence of various species discussed; Flach, Deutsche E. Z. xxvi. pp. 253 & 254.

Anisodactylus rotundangulus and *Notiobia disparilis* and *cupreda*, Bates, figured by him; Biol. Centr. Am. *Col.* i. (1) pl. iii. figs. 14–16.

Anisotarsus chloroderus, *purpurascens*, p. 50, *cyanippus*, pl. iii. fig. 13, and *lamprotus*, p. 51, Bates, *l. c.*, Mexico: spp. nn.

Notiobia obscura and var. *virens*, Mexico, *incerta*, Chontales, *pallipes*, Mexico, and var. *subaurata*, Guatemala, p. 53, *melæna*, *æquata*, Mexico, *championi*, Panama, p. 54, *umbrata*, p. 55, and *sinuessa*, Guatemala, p. 56, *id. l. c.*: spp. nn.

Harpalides.

Selenophorus pyritosus, Dej., *tarsalis* and *splendidus*, Putz., *Stenomorphus rufipes*, Lec., *Athroostictus sericatus*, Bates, and *Barysomus metallicus*, Reiche, figured; Bates, Biol. Centr. Am. *Col.* i. (1) pl. iii. figs. 18, 23, 19, 12, 25 & 24.

Acinopus. Sicilian species discussed; Baudi, Nat. Sicil. i. pp. 84–88.

Pangus americanus, Motsch.,= *Discoderus impotens*, Lec.; Horn, Tr. Am. Ent. Soc. x. p. iv.

Ophonus planiusculus, Kraatz, = *rayii*, Lind.; Von Heyden, Deutsche E. Z. xxvi. pp. 254 & 255.

Harpalus atratus, Ball., *nec* Latr., renamed *ballionis*; id. *l. c.* p. 300.

Pelmatellinæ, subfam. n., Bates, Biol. Centr. Am. *Col.* i. (1) p. 67. Agrees with the *Anisodactylinæ* in the brush-like clothing of the dilated male tarsi, but differs in having the penultimate joint of the labial palpi, bisetose, as in the *Stenolophinæ*. To include the genera *Pelmatellus*, *Thenarellus*, *Lecanomerus*, *Thenarotes*, *Syllectus*, and *Nematoglossa*.

Perigoninæ. Bates substitutes this name for *Trechechinæ*; Biol. Centr. Am. *Col.* i. (1) p. 133.

New genera and species:—

Pardileus, Des Gozis, MT. schw. ent. Ges. vi. p. 289, note. Allied to *Pseudophonus*; eyes smooth; type, *Harpalus calceatus*, Duft.

Pelmatellus, Bates, Biol. Centr. Am. *Col.* i. (1) p. 68. Resembles *Stenolophus*; to include *P. nitescens*, pl. iii. fig. 17, Mexico, Guatemala, *stenolophoides*, Mexico, *obtusus*, p. 68, *vexator*, Guatemala, and *cyanescens*, Mexico, p. 69, spp. nn.

Thenarellus, id. *l. c.* p. 69. Allied to last; type, *T. leucopus*, sp. n., *id. ibid.*, Costa Rica.

Trichoselaphus minor, id. *l. c.* p. 64, Mexico.

Bradycellus limbicollis, *nigrellus*, and *angulifer*, id. *l. c.* p. 73, Mexico and Guatemala; *B.* (*Dichirotrichus*) *godarti*, Jacquet, Rev. d'Ent. i. p. 262, S. France.

Discoderus piger, *difformipes*, and *distortus*, pl. iii. fig. 21, Bates, *l. c.* p. 63, Mexico.

Selenophorus chiriquinus, Panama, *semirufus*, Mexico, and *valgus*, Costa Rica, *id. l. c.* pp. 60–62.

Ophonus zigzag, Costa, Atti Acc. Nap. ix. (6) p. 33, fig. 2, Calabria.

Harpalus platyderus, *hebescens*, p. 57, and *liolus*, p. 58, Bates, *l. c.*, Mexico.

Acupalpus lemovicensis, Blense, Rev. d'Ent. i. p. 44, Limoges.

Stenolophus mexicanus, Bates, *l. c.* p. 70, Mexico.

Trogonotomides.

Setalidius attenuatus, sp. n., Fauvel, Rev. d'Ent. i. p. 245, Pine Island.

Feroniides.

Polpochila capitata, Chaud., *Curtonotus putzeysi*, *Allotriopus serratipes*, *Hypoherpes brachypterus*, *Euchroa dimidiata*, Chaud., *nitidipennis*, Putz., *Loxandrus tetrastigma*, Bates, and *Stolonis intercepta*, Chaud., figured; Bates, Biol. Centr. Am. *Col.* i. (1) pls. iii. fig. 20, iv. figs. 1, 7, 8, 11, 10, 13 & 15.

Feronia, Latr. Table of Belgian species; Van den Brandeu, Bull. Soc. Dinant. ii. pp. 99–104. *F. arctiola*, Chaud., = *infirma*, Mäkl., = *arctica*, Sahlb.; Schaufuss, Nunq. Ot. iii. p. 560. *F. placida*, Rosenh., discussed; Gredler, Z. Ferd. (3) xxvi. pp. 208–210, note.

Pœcilus lissomus, Chaud. (= *lævigatus*, Mén.), redescribed; Heyden, Deutsche E. Z. xxvi. p. 310.

Percus, sp. from Sardinia noticed; Costa, Atti Acc. Nap. ix. 11, p. 31.

Zabrus. In the French, and probably in the European species generally, the hinder angles of the pronotum are destitute of setigerous pores, as in the *Oodini*, but these exist in a Syrian and in several N. African species. *Z. pumilio*, La Brûlerie, should be referred to *Amara*. Bedel, Bull. Soc. Ent. Fr. (6) ii. pp. cxxii. & cxxiii.

Amara spreta and *famelica* differentiated; De Borre, CR. Ent. Belg. xxvi. pp. cxliii. & cxliv.

New genera and species:—

Lianoe, Des Gozis, MT. schw. ent. Ges. vi. p. 298. Allied to *Pœcilus*, *Pterostichus*, &c., lateral edge of the thorax with two or three setigerous pores before the ordinary middle pore. Type, *Pterostichus boisgiraudi*, Duf. (= *dufouri*, Dej.)

Aello, id. *l. c.* p. 297. Allied to *Percus*, but with a juxtascutellar stria; interstriæ, 3, 5 & 7, marked with three or four impressed points. Type, *Pterostichus prevosti*, Duft.

Percolaus, Bates, Biol. Centr. Am. *Col.* i. (1) p. 80. Allied to *Percus*, but anterior tarsi of ♂ simple. Type, *P. championi*, sp. n., *l. c.* p. 80.

Polpochila rotundicollis, id. *l. c.* p. 74, Mexico.

Celia hogii, Mexico, *championi*, Mexico, Guatemala, p. 77, *tenebrionella*, pl. iv. fig. 2, and *xanthognatha*, Mexico, p. 78, *id. l. c.*

Amara azteca, id. *l. c.* p. 79, pl. iv. fig. 3, Mexico.

Evarthrus constrictus, id. *l. c.* p. 80, pl. iv. fig. 4, Mexico.

Hypoherpes longissimus, pl. iv. fig. 6, p. 81, *taeniola*, Guatemala, and *ampliatus*, Mexico, p. 82, *id. l. c.*

Platysma tropicalis, id. *l. c.* p. 83, pl. iv. fig. 9, Mexico.

Ophryogaster flohri, id. *l. c.* p. 84, Mexico.

Euchroa flohri, id. *l. c.* p. 85, Mexico.

Loxandrus unistigma, Guatemala, and *infimus*, Mexico, Guatemala, *id. l. c.* p. 87.

Notonomus savesi, Fauvel, Rev. d'Ent. i. p. 242, New Caledonia.

Feronia (Pœcilus) prasina, Oliviera, Rev. Soc. Porto, ii. p. 367, Portugal.

Derus kraatzi, Heyden, Deutsche E. Z. xxvi. p. 311, Samarcand.

Metaxys irisans, Ancey, Nat. Sicil. ii. p. 69, Abyssinia.

Homalosoma griseolum, Fauvel, Rev. d'Ent. i. p. 243, Pine Island.

Trichostomus pictus, p. 219, *combesi*, *humeralis*, p. 220, *fultoni*, and *enysi*, p. 221, Broun, N. Z. J. Sci. i.

Holcaspis cribrale[*-lis*] and *catenulata*, id. *l. c.* p. 222, New Zealand.

Abacomorphus asperulus, Fauvel, *l. c.* p. 243, New Caledonia.

Cerabilia punctigera and *ruficorne*[*-nis*], Broun, *l. c.* p. 223, New Zealand.

Anchomenides.

Bates, Biol. Centr. Am. *Col.* i (1), figures the following known species of *Anchomeninæ*:—*Calathus ovipennis*, Putz., fig. 20, *montezumæ*, Bates, fig. 24, *Anchomenus scutifer*, Bates, fig. 22, *decempunctatus*, Reiche, fig. 23, pl. iv. *Glyptolenus rugicollis*, Bates, fig. 1, *Colpodes stricticollis*, Bates, fig. 3, *gratus*, Bates, fig. 8, *procephalus*, Bates, fig. 6, *lyrophorus*, fig. 13, *aphodrus*, Chaud., fig. 12, *melanocnemis*, Chaud., fig. 19, *femoralis*, fig. 16, *lactipes*, Bates, fig. 17, *lebioides*, Bates, fig. 21, pl. v.

Acupalpus biseriatus, Karsch, = *Cyclothorax cordaticollis*, Blackb., *Platynus planus*, K., = *Anchomenus erro*, B., *Colpodes octo ocellatus*, K., = *Anchomenus sharpi*, B., *Anisodactylus cuneatus*, K., = *Atrachycnemis sharpi*, B., and *Promecoderus fossulatus*, K., = *Disenotus terebratus*, B.; Blackburn, Ent. M. M. xix. pp. 62 & 63.

Pseudotaphoxenus substriatus and *juvencus*, Ball., redescribed; Heyden, Deutsche E. Z. xxvi. p. 308.

Anchomenus distinctus, Chaud., differentiated from *angusticollis*, De Borre, CR. Ent. Belg. xxvi. pp. xxxiii. & xxxiv. (*cf.* also p. lxxiii.). A Belgian variety of the latter named *putzeysi*, id. *l. c.* pp. xci. & xcii. *A. astur*, Sharp, is quite distinct from *melanocephalus*, Dej.; Sharp, Deutsche

E. Z. xxvi. p. 256. *A. helmsi*, Sharp, redescribed; Broun, N. Z. J. Sci. i. p. 219.

Platynus chalybæus, Gradl. = *muelleri*, Herbst, var. *cæruleascens*, Letzn.; Kraatz, Deutsche E. Z. xxvi. p. 156. *P. maculicollis*, Dej., abundant in California; Riley & others, Nature, xxv. p. 386, xxvi. pp. 681 & 682.

Tropopterus patulus, Broun, is an *Ooderus*; Broun, N. Z. J. Sci. i. p. 224.

New genera and species:—

Clibanarius, Des Gozis, MT. schw. ent. Ges. vi. p. 295. Allied to *Europhilus*, Chaud.; thorax cordiform, with the hinder angles straight or slightly prominent. Type, *Platynus dorsalis*, Pontopp. (*prasinus*, Thunb.).

Elliptoleus, Bates, Biol. Centr. Am. *Col.* i. (1) p. 97. Allied to *Anchomenus*, elytra shorter, setiferous puncture placed on the lateral margins of the thorax; to include *Anchomenus vixstriatus*, Bates, *Agonum flavipes*, Dej. (figured, pl. iv. fig. 21), and *E. curtulus*, p. 97, *crepericornis*, and *acutisculptus*, p. 98, spp. nn., *id. l. c.*, Mexico.

Cyrtolaus, id. *l. c.* p. 99. Allied to *Colpodes*, but ligula narrowed near the apex almost as in *Loptotrachelus*, elytra generally convex and strongly sculptured, armed near the sutural angle with a distinct spine. Type, *C. furculifer*, p. 99, *spinicauda*, pl. v. fig. 2, and *lobipennis*, p. 100, spp. nn., *id. l. c.*, Guatemala.

Sphodrosomus gambeyi, Fauvel, Rev. d'Ent. i. p. 246, New Caledonia.

Pseudotaphoxenus kraatzi, Heyden, Deutsche E. Z. xxvi. p. 309, Samarcand.

Calathus vagestriatus and *parvicollis*, Fairmaire, Le Nat. ii. p. 191; *C. theodori*, Ancey, Nat. Sicil. ii. p. 70: all from Abyssinia.

Abaris bigenera, Bates, Biol. Centr. Am. *Col.* i. (1) p. 86, pl. iv. fig. 12, Mexico and Guatemala.

Adrimus olivaceus, id. *l. c.* p. 87, pl. iv. fig. 14, Guatemala.

Platynus mattosi, Oliviera, Rev. Soc. Porto, ii. p. 313, Portugal; *P. leptodes* (figured as *P. leptomorphus*, pl. iv. fig. 25), and *euprepes*, Bates, *l. c.* pp. 92 & 93, Mexico.

Cyphocoleus ovicollis, *miricollis*, p. 248, *latipennis*, *flavipes*, and *globulicollis*, p. 249, Fauvel, *l. c.*, New Caledonia.

Dichrochile nitida and *cinctiger*[*-ra*], Broun, N. Z. J. Sci. i. pp. 216 & 217, New Zealand.

Anchomenus haasti and *sandageri*, id. *l. c.* pp. 217 & 218, New Zealand; *A. cyanopis*, Mexico, p. 94, *patinalis*, Mexico, Guatemala, *cavatus*, Mexico, p. 95, and *dominicensis*, Mexico to Panama, p. 96, Bates, *l. c.*

Cyclothorax karschi, Blackburn, Ent. M. M. xix. p. 62, Hawaii.

Glyptolenus transformatus, Bates, *l. c.* p. 99, Guatemala.

Colpodes pterostichoides, fig. 4, p. 102, *durangensis*, Mexico, p. 105, *championi*, fig. 10, *cæcides*, p. 107, *castanipes*, *incultus*, fig. 5, *evanescens*, fig. 7, Guatemala, p. 108, *forreri*, fig. 9, Mexico, *bispinis*, Costa Rica, p. 109, *purulensis*, Guatemala, p. 110, *chiriquinus*, fig. 11, Chiriqui, p. 111, *cyanides*, Guatemala, *horni*, Costa Rica, p. 112, *subauratus*, p. 113, *chloreus*,

p. 115, *megalops*, Mexico, *spinifer*, fig. 15, Guatemala, p. 116, *unilobatus*, Mexico, Guatemala, *melanius*, *opalescens*, Chiriqui, p. 117, *lamprotus*, fig. 18, p. 118, *zunilensis*, *incomis*, p. 120, *leucoscelis*, Guatemala, p. 121, *quadridentatus*, Costa Rica, p. 122, *proteinus*, Guatemala, p. 123, *jalapensis*, Mexico, *scabricollis*, Guatemala, p. 126, *lissomus*, Chontales, *hemicyclicus*, fig. 22, *convergens*, *ampliatus*, p. 127, *dyschirioides*, fig. 23, Chiriqui, *quadrilaterus*, Mexico, p. 128, *iricolor*, Guatemala, and *ignicauda*, fig. 20, Panama, p. 129, *id. l. c.* pl. v.

Onypterygia quadrispinosa, pl. v. fig. 24, Guatemala, *championi*, Chiriqui, p. 130, *chrysura*, p. 131, and *longispinis*, pl. v. fig. 25, Guatemala, p. 132, *id. l. c.*

Diploharpus perpolitus, id. *l. c.* p. 134, pl. vi. fig. 1, Guatemala.

Tropopterus marginalis, Broun, *l. c.* p. 219, New Zealand.

Trechides.

Agaosoma californicum, Ménétr., is still an undetermined species, but probably belongs to *Stenomorphus*, Sol.; Horn, Tr. Am. Ent. Soc. x. pp. iv. & v.

Anophthalmus acherontius, Schauf., = *reitteri*, Mill.; Reitter, Wien. ent. Zeit. i. p. 68. Schaufuss denies this; Bull. Soc. Ent. Fr. (6) ii. pp. ciii. & civ.

Aepus robini, Lab., habits and collecting; De Brossay, Feuill. Nat. ii. p. 44.

Sporades, g. n., Fauvel, Rev. d'Ent. i. p. 234. Facies of *Trechus*, but exhibiting affinities to *Blemus*, *Pogonus*, &c.; type, *S. sexpunctatus*, sp. n., *l. c.* p. 235, New Caledonia.

Trechus aveyronensis, Fauvel, Rev. d'Ent. i. p. 70, Aveyron; *T. coarctatus*, Bates, Biol. Centr. Am. *Col.* i. (1) p. 136, pl. vi. fig. 3, Mexico: spp. nn.

Anophthalmus likanensis, Schaufuss, Bull. Soc. Ent. Fr. (6) ii. p. cxxv., Croatia, Dalmatia; *A. siculus*, Baudi, Nat. Sicil. i. p. 116, Sicily: spp. nn.

Anchonoderides.

Amphibia scalaris, *sexualis*, p. 270, *laterideus*, *parvicollis*, p. 271, and *trapezus*, p. 272, spp. nn., Fauvel, Rev. d'Ent. i., New Caledonia.

Bembidiides.

Bates, Biol. Centr. Am. *Col.* i. (1) pl. vi., figures his *Tachys diploharpinus*, fig. 11, *Pericompsus longulus*, fig. 9, *Xystosomus belti*, fig. 8, also *Bembidium mexicanum*, Dej., fig. 13.

Tachys bistriatus and allies discussed and tabulated; Rey, Rev. d'Ent. i. pp. 236–238.

Bembidium riparium, Ol. (= *inoptatum*, Schaum), is distinct from *biguttatum*, Ol.; Schaufuss, Bull. Soc. Ent. Fr. (6) ii. p. lxxxiv. *B. iridicolor*, Bedel, noticed; Ragusa, Nat. Sicil. i. pp. 226 & 227. *B.* (*Leia*) *bipunctatum*, var. *lævifrons* from Estrella noticed; Schaufuss, Nunq. Ot. iii. p. 552.

Peryphus cæruleus, Dej., is distinct from *fasciolatus*, Duft.; Schaufuss, Bull. Soc. Ent. Fr. (6) ii. p. clxxiii.

Mioptachys, g. n., Bates, Biol. Centr. Am. *Col.* i. (1) p. 144. Allied to *Tachys*, *Anillus*, and *Scotodipnus*; eyes present, body glabrous, terminal joint of palpi long. Types, *M. trechoides*, pl. vi. fig. 6, and *oopteroides*, spp. nn., *l. c.* p. 144. *Polyderis breviuscula*, Motsch., probably also belongs to this genus.

New species:—

Anillus integripennis, Bates, Biol. Centr. Am. *Col.* i. (1) p. 145, pl. vi. fig. 5, Guatemala.

Tachyporus abnormicollis, Von Heyden, Deutsche E. Z. xxvi. p. 118, Margelan.

Tachyta autumnalis, Mexico, Guatemala, and *cucujoides*, pl. vi. fig. 7, British Honduras, Guatemala, Bates, *l. c.* pp. 137 & 138.

Xystosomus sublævis and *sulcicostis*, Bates, *l. c.* p. 146, Chiriqui.

Tachys castanicolor, Guatemala, *chiriquinus*, Chiriqui, *lymnæoides*[*lim-*]. Guatemala, p. 139, *obtusellus*, Mexico, *mundulus*, Mexico, Guatemala, *pericallis*, pl. vi. fig. 10, Guatemala, p. 141, *microspilus*, Guatemala, Nicaragua, *purgatus*, Mexico, Guatemala, *amplicollis*, Mexico, Guatemala, Nicaragua, p. 142, *jansoni*, Chontales, *curvans*, Guatemala, and *cribellatus*, Mexico, Guatemala, p. 143, *id.* l. c.; *T. discipennis*, p. 232, *amplipennis* and *arculus*, p. 233, Fauvel, Rev. d'Ent. i., New Caledonia.

Pericompsus sticticus, Bates, *l. c.* p. 146, Guatemala.

Bembidium sphæroderum, pl. vi. fig. 12, Mexico, p. 147, *championi*, Guatemala, p. 148, *lucidum*, Hudson's Bay to Mexico, *vernale*, Mexico, p. 149, *scintillans*, Mexico, p. 150, and *sparsum*, Mexico, Guatemala, p. 151, *id.* l. c.; *B. musæ* and *latiusculum*, Broun, N. Z. J. Sci. p. 225, New Zealand; *B. hamiferum*, Fauvel, *l. c.* p. 231, Kanala.

Amphizoa davidis, Lucas, Bull. Soc. Ent. Fr. (6) ii. p. clvii., Moupiu.

Dytiscidæ.

Burgess, E. The structure of the mouth in the larva of *Dytiscus*. P. Bost. Soc. xxi. pp. 223–228, woodcuts.

Instead of being mouthless, as usually assumed, the insect has a very wide mouth, but the lips are closely locked together by a dovetailed grooved joint.

Sharp, D. On aquatic carnivorous *Coleoptera* or *Dytiscidæ*. Tr. Dubl. Soc. (2) ii. pp. 179–1003, pls. viii.–xviii. [*Cf.* Marseul, Nouv. et faits (2) pp. 161–164.]

A very elaborate work, prefaced by a detailed description of the structure of the insects. 1171 species are described, and those of other species, unknown to the author, are added in an appendix, raising the total number to 1511. A trinomial nomenclature is adopted throughout, species already known being quoted under their genus, both by the generic and specific names of the original describer. The first two plates are devoted to details; the remainder represent one or more species of all the genera (upwards of 200, of which a large proportion are new),

described in this work. The *Dytiscidæ* are divided into two main groups, *Dytisci Fragmentati* and *Dytisci Complicati*, according to whether the metathoracic episternum reaches the middle coxal cavity or not; but it would be difficult to give a coherent account of the classification adopted, owing to isolated genera being frequently treated as equivalent to named tribes and groups. No references, or even authors' names, are quoted for genera.

The following known species are figured:—*Pelobius australasiæ*, Clark, fig. 106, *Noterus clavicornis*, De Geer, fig. 111, *Colpius inflatus*, Lec., fig. 112, *Canthydrus nigrinus*, Aubé, fig. 114, *Hydrocanthus grandis*, Lap., fig. 115, *Vatellus tarsatus*, Lap., fig. 117, pl. ix., *Amphizoa insolens*, Lec., pl. x. fig. 121, *Hyphydrus japonicus*, Sharp, figs. 137 & 138, *australis*, Clark, fig. 139, pl. xi., *Celambus acaroides* and *nubilus*, Lec., pl. xii. figs. 145 & 147, *Hydroporus undulatus*, Say, *lapponum*, Gyll., *nigriceps*, Schaum, and *addendus*, Crotch, figs. 157–160, *Celina aculeata*, Aubé, fig. 161. *Agabus cordatus*, Lec., fig. 165, pl. xiii. *cephalotes*, Reiche, *brunneus*, Fab., *gagates*, Aubé, *disintegratus*, Crotch, *bifarius*, Kirby, *conspicuus*, Sharp, *fuscipennis* and *serricornis*, Payk., pl. xiv. figs. 166–173, *Platambus pictipennis*, Sharp, fig. 180, *Ilybius quadrivalis*, Sharp, fig. 182, *Copelatus sulcipennis*, Cast., fig. 187, and *aubæi*, Montr., fig. 188, pl. xv. *Matus bicarinatus*, Say, fig. 192, *Coptotorius interrogatus*, Fabr., fig. 193, *Scutopterus horni*, Crotch, fig. 196, *Rhantus cicurus*, Fabr., *Colymbetes sculptilis*, Harr., *Meladema lanio*, Fabr., *Hyderodes shuckardi*, Hope, figs. 198–201, pl. xvi., *H. shuckardi*, ♀, fig. 202, *Dytiscus hybridus*, Aubé, fig. 203, *lapponicus*, Gyll., figs. 204 & 205, *Hydaticus bihamatus* and *petiti*, Aubé, figs. 207 & 208, *Acilius semisulcatus*, Aubé, figs. 209 & 210, *Thermonectus marmoratus*, Hope, and *basilaris*, Harr., figs. 211 & 212, pl. xvii., *Sandracottus hunteri*, Crotch, var. *chevrolati*, Aubé, fig. 214, *Graphoderes adamsi*, Clark, and *verrucifer*, Sahlb., figs. 216 & 217, *Eretes australis*, Er., fig. 218, *Cybister owas*, Cast., *limbatus*, Fabr., and *japonicus*, Sharp, figs. 223–225, pl. xviii.

Times of appearance of rare *Hydradephaga*; Hey & Power, Ent. xv. pp. 211 & 212.

Fresh-water bivalves carried about by *Dytiscidæ*; Darwin, J. Northampton Soc. ii. pp. 69 & 70.

Sharp, Biol. Centr. Am. *Col.* i. (2), figures *Agabus americanus*, *Rhantus atricolor*, *Thermonectus nigro-fasciatus*, and *Megadytes fallax*, Aubé, and *Cybister fimbriolatus*, Say, pl. i. figs. 8, 11–14.

Hydroporus flavipes, Ol., discussed, and varr. *octo-lineatus*, *portalegrensis*, Portugal, *manducus*, Sardinia, and *montenegrinus*, from Montenegro described: also *H. distinguendus*, Desbr., var. *estrellensis* from Estrella; Schaufuss, Nunq. Ot. iii. pp. 558 & 559. *H. fairmairii*, Lepr., = *brannani*, Schauf., & ? = *restitus*, Fairm., *nec* Gebl.; *id.* Bull. Soc. Ent. Fr. (6) ii. p. lxxxiv. *H. berticus*, Schaum, and *Herophydrus* (*Hydroporus*) *guineensis*, Aubé, noticed; Ragusa, Nat. Sicil. i. pp. 248 & 249. *H. bryanstoni*, Sharp (*nec* Clark), described; Tr. Dubl. Soc. (2) ii. p. 342: renamed *Desmopachria mutata*, Sharp, Biol. Cent. Am. *Col.* i. (2) p. 18.

Hydrocanthus lineatus, Wehncke (nec *Suphis lineatus*, Horn, which is congeneric), renamed *Canthydrus mexicanus*, and refigured; Sharp, *l. c.*

p. 6, pl. i. fig. 4. *H. notula*, var. *similis* described; Ragusa, Nat. Sicil. i. p. 209, pl. xi. fig. 4.

Rhantus latitans, Sharp, noticed as new to France; Bedel, Bull. Soc. Ent. Fr. (6) ii. p. clxxiii.

Colymbetes sobrinus, Motsch., = *Agabus brevicollis*, Lec.; Schaufuss, Bull. Soc. Ent. Fr. (6) ii. p. clxxiii.

Agabus fusco æneseens, Régimb., redescribed; Ragusa, *l. c.* pp. 227 & 228.

Cybister binotatus, Klug, and *senegalensis*, Aubé, noticed; Ragusa, *l. c.* pp. 249 & 250.

Dytiscus fasciventris, Say, found in a glass of water after a shower; Murtfeldt, Am. Nat. xvi. p. 600. *D. latissimus*, Linn., variation noticed; Dohrn, S. E. Z. xliii. pp. 470 & 471. *D. marginalis*: note on parasites; Laker & Blake, Sci. Goss. xviii. pp. 46, 90, 91 & 208. *D. punctulatus*, var. *maurus* from Dresden noticed; Schaufuss, *l. c.* p. clxxiii.

New genera and species :—

Notomicrus, Sharp, Tr. Dubl. Soc. (2) ii. pp. 261 & 833. Allied to *Noterus*; anterior tibiæ destitute of a curved spur, and with indefinite outer apical angle; posterior coxal cavities but little separated, coxal notch scarcely visible. To include *N. lævigatus*, pl. ix. fig. 107, p. 260, *suturalis*, Australia, *brevicornis*, Brazil, and *trailli*, Tapajos, p. 261, spp. nn.; add *N. gracilipes* and *politus*, Sharp, Biol. Centr. Am. *Col.* i. (2) p. 3, Guatemala.

Pronoterus, id. Tr. Dubl. Soc. (2) ii. pp. 263 & 835. Allied to *Noterus*, front tibiæ with acute outer apical angle; curved spur small. Type, *P. punctipennis*, sp. n., *l. c.* p. 263, pl. ii. fig. 109, Brazil.

Synchortus, id. *l. c.* pp. 264 & 835. Allied to *Noterus*, anterior tibiæ with indefinite outer apical angle, with elongate curved spur, antennæ slender, hind tibiæ broad and flattened. To include *S. simplex*, *aciculatus*, *sparsus*, Africa, and *duplicatus*, pl. ii. fig. 110, p. 264, spp. nn., and *Hydrocanthus asperatus*, Fairm., and *rugoso-punctatus*, Wehncke.

Canthydrus, id. *l. c.* pp. 269 & 838. Allied to *Hydrocanthus*, prosternal process only moderately broad, not broader than long; swimming legs rather slender. To include several species described by authors under *Hydrocanthus*, *Suphis*, &c.; and *C. sculpturatus*, *vicinus*, p. 269, *ovatus*, *grossus*, *rotundatus*, Brazil, *insularis*, San Domingo, *punctipennis*, Carolina, p. 270, *subsignatus*, Panama, p. 271, *dilutus*, Bahia, *rem[ig]ator*, Uruguay, *curtus*, Amazons, p. 272, *brevicornis*, Parana, *rufipes*, Cuba, Amazons, p. 273, *centralis*, Guatemala, *grammicus*, Amazons, *concolor*, Madagascar, p. 274, *arabicus*, Hedjaz, *ornatus*, Persia, p. 275, *frontalis*, Arabia, Bombay, *sexpunctatus*, Tranquebar, p. 276, *angularis*, Singapore, p. 277, *proximus*, Siam, *nitidulus*, N. China, Formosa, and *flammulatus*, Siam, Celebes, p. 278, spp. nn.; add *C. simplex*, pl. i. fig. 3, *varians*, Guatemala, p. 5, and *majusculus*, Panama, p. 6, spp. nn., *id.* Biol. Centr. Am. *Col.* i. (2).

Macrovatellus, id. Tr. Dubl. Soc. (2) ii. pp. 282 & 840. Allied to *Vatellus*, size moderate; ventral sutures normal, mesosternum largely exposed between the prothorax and metasternum; outline of thorax and elytra

discontinuous. To include *Vatellus haagi*, Wehncke; *V. grandis*, Buq., and *M. lateralis* (pl. ix. fig. 116), Uruguay, *rudis*, S. America, *sahlbergi*, Petropolis, p. 283, *marginalis*, S. America (Santa Rita) *mexicanus*, Mexico [*cf.* also Biol. Centr. Am. *Col.* i. (2) p. 8], p. 284, and *ventralis*, Brazil, p. 285, spp. nn.

Derovatellus, id. *l. c.* pp. 286 & 841. Allied to *Vatellus*, size small; mesosternum not much exposed; ventral sutures ordinary. Type, *V. lentus*, Wehncke, figured, pl. x. fig. 118.

Neptosternus, id. *l. c.* pp. 317 & 843. Allied to *Laccophilus*; prosternal process acutely tridentate; spurs of hind tibiæ acuminate at apex, head rather short, hinder angles of prothorax very acute. Type, *N. ornatus*, sp. n., *l. c.*, Zanzibar, Madagascar (figured as *N. tridens*, pl. x. fig. 120).

Queda, id. *l. c.* pp. 336 & 849. Allied to *Hydrovatus*, coxal incision shorter in the longitudinal than in the transverse direction; only the fringes of the labrum visible. Type, *Q. compressa*, sp. n., *l. c.* pl. x. fig. 122, Santa Rita, Brazil.

Heterhydrus, id. *l. c.* pp. 337 & 850. Allied to *Hyphydrus*; labrum conspicuously exserted on under surface of head; middle coxæ rather widely separated; prosternal process broader than long, its obtuse hind margin reaching the metasternum. Hind tibiæ straight, the basal portion not conspicuously narrower than the apical one. Type, *Hyphydrus senegalensis*, Aubé (figured, pl. x. fig. 124).

Pachydrus, id. *l. c.* pp. 338 & 850. Allied to *Hyphydrus*; labrum concealed, only its front margin and fringes being visible; middle coxæ rather widely separated; prosternal process broader than long, its obtuse hind margin reaching the metasternum; hind tibiæ straight, their basal portion not conspicuously narrower than the apical one. To include *Hyphydrus obniger*, Chevr., probably *H. cayennensis*, Cast., and *globosus*, Aubé, and *P. punctatus*, pl. x. fig. 125, Brazil, *cribratus*, Mexico, Guadeloupe, p. 338, *obesus*, Venezuela, and *brevis*, Porto Rico. Antigua, p. 339, spp. nn.; add *P. politus*, sp. n., id. Biol. Centr. Am. *Col.* i. (2) p. 16, Guatemala, Mexico.

Bidessus, id. Tr. Dubl. Soc. (2) ii. pp. 344 & 852. Allied to *Hyphydrus*, prosternal process longer than broad, parallel-sided, but with a more or less acute extremity which attains the metasternum; intercostal process of metasternum not attaining the metasternal fork, so that when the prothorax is taken away, it may be seen that the middle coxæ touch one another; posterior tibiæ with the basal portion much more slender than the apical one; coxal lines longer than prosternal process. Upwards of 80 species, occurring in all parts of the world, are referred to this genus, those previously known were mostly described under *Hydroporus*; the following are new:—*B. migrator*, Australia, p. 345, *borrii*, Pernambuco (?), p. 346, *bicristatus*, Jeddah, *dohrni* (Wehncke, MS.), S.W. Africa, p. 347, *insignis*, pl. x. fig. 128, Hedjaz, *pictodes*, N. America, p. 348, *obesus*, Texas, p. 349, *discretus*, Texas, p. 350, *coxalis*, Madrid, Tangiers, p. 351, *major*, Arabia, Persia, *laticulus*, Siam, Macassar, p. 354, *strigicollis* (Fairmaire, MS.), Madagascar, *sordidus*, Abyssinia, p. 355, *striola*, Celebes, *signatus*, *godeffroyi* (Wehncke, MS.), p. 356, *dæmeli* (Wehncke, MS.), Australia, *orthogrammus*, N.W. Australia, p. 357, *transversus*, p. 358, *fuscipennis*,

Siam, *denticulatus*, Australia, *flammulatus*, China, p. 359, *inornatus*, West Australia, *impressus*, New Zealand, Australia, *plicatus*, pl. x. fig. 127, p. 360, *huttoni*, New Zealand, p. 361, *mundus*, *biformis*, p. 362, *disper*, Australia, *occultus*, Hedjaz, *perforatus*, China, p. 363, *dilutus*, Siam, p. 364, *uruguensis*, Uruguay, *crassus*, p. 365, *atomarius*, Brazil, *texanus*, Texas, p. 366, *lynceus*, Guatemala, p. 368, and *discoidalis*, Parana, p. 369; add *B. discedens*, Mexico, p. 19, *hydrovatoides*, fig. 5, *germanus*, fig. 6, Guatemala, p. 20, *quadrisignatus*, Mexico, Guatemala, *quadrinotatus*, Mexico, p. 21, *latifrons*, Guatemala, *substriatus*, Mexico, p. 22, *subornatus*, Mexico, Guatemala, p. 23, *abjectus*, Mexico, *spretus*, *obtusus*, p. 24, and *elongatus*, fig. 7, Guatemala, p. 25, *id.* Biol. Centr. Am. *Col.* i. (2) pl. 1.

Huxelhydrus, id. Tr. Dubl. Soc. (2) ii. pp. 369 & 854. Allied to *Bidessus*; prosternal process elongate, parallel-sided; intercoxal process of metasternum not attaining the mesosternal fork; hind tibiæ with a distinct slender basal portion; coxal lines shorter than the prosternal process. Type, *H. syntheticus*, sp. n., *l. c.* p. 369, pl. x. fig. 129, N. Australia, New Zealand.

Tyndallhydrus, id. *l. c.* pp. 370 & 854. Affinities doubtful, placed after *Huxelhydrus*; prothorax narrowed behind; prosternal process prevented by the contiguous and intervening middle coxæ from attaining the metasternum. Type, *T. caraboides*, sp. n., *l. c.* p. 370, pl. xi. fig. 130, Algoa Bay.

Andex, id. *l. c.* pp. 371 & 855. Allied to *Hyphydrus*; prosternal process abbreviate, its concealed extremity not extending outside the middle coxæ, and not reaching the metasternum; prothorax much narrower than the rest of the body, so that the outline at the shoulders is much interrupted. Type, *A. insignis*, sp. n., *l. c.* p. 371, pl. xi. fig. 131, Cape of Good Hope.

Hydropeplus, id. *l. c.* pp. 372 & 855. Placed after *Andex*; terminal joint of front tarsus quite twice as long as the second joint; head rounded in front; elytra at the shoulder of the epipleura, with a fossa limited behind by a distinct raised line. Type, *Hydroporus trimaculatus*, Cast. (figured, pl. xi. fig. 132).

Primospes, id. *l. c.* pp. 372 & 356. Placed after *Hydropeplus*; head subtruncate in front; the depression at the base of the elytral epipleura not limited behind by a raised line. Type, *P. suturalis*, sp. n., *l. c.* pl. xi. fig. 133, Cape Town.

Cœlhydrus, id. *l. c.* pp. 373 & 856. Placed after *Primospes*; epipleura much narrowed from the shoulder to the hind margin of the first ventral segment; behind that very slender, and therefore nearly parallel; last joint of the front tarsus about as long as the third joint; prosternal process reaching intercoxal process of the metasternum. Type, *C. breviicollis*, sp. n., *l. c.* p. 373, pl. xi. fig. 134, S. Africa.

Darwinhydrus, id. *l. c.* pp. 373 & 857. Placed after *Cœlhydrus*; epipleura of elytra becoming gradually narrower from the shoulder to the extremity; outline of thorax and elytra quite continuous, the latter acutely costate. Type, *D. solidus*, sp. n., *l. c.* p. 374, pl. xi. fig. 135, Cape Town.

Sternopriscus, id. *l. c.* pp. 384 & 858. Affinities uncertain, placed after

Hyphydrus; fourth joint of front and middle tarsi distinctly visible; mesosternum intervening conspicuously between the pro- and metasternum, its epimera extremely short, almost linear, ventral segments not soldered with the coxæ; hind coxal cavities not contiguous, but prolonged inwards over the coxal process, so as to become nearly connected. To include *Hydroporus hansardi*, *meadforti*, and *multimaculatus*, Clark, and *S. browni*, pl. xi. figs. 140 & 141, *obscurus*, King George's Sound, p. 385, *clavatus* (Wehncke, MS.), *tarsalis*, Sidney, *signatus*, Murray River, p. 386, *wehnckii*, Australia, p. 387, *oscillator*, Adelaide, and *tasmanicus*, Tasmania, p. 388: spp. nn.

Hyphoporus, id. *l. c.* pp. 390 & 859. Allied to the *Hydroporini*; elytral ligula free and abrupt; terminal joint of front tarsus much shorter than the third. To include *Hydroporus solieri*, Aubé, pl. xii. fig. 142, *interpulsus*, Walk., *Hyphydrus rufus*, Clark, and *Hyphoporus elevatus* and *aper*, spp. nn., *l. c.*, N. America.

Paroster, id. *l. c.* pp. 391 & 860. Placed after *Hyphoporus*, elytral ridge very little developed; posterior coxal cavities much exposed, and a good deal separated; posterior joints of epipleura very narrow; hind tibiæ with only the serial punctures on the infero-external face. To include *Hydroporus nigro-adumbratus* and *insculptilis*, Clark, and *P. pallescens*, sp. n., *l. c.* p. 391, pl. xii. fig. 143, West Australia.

Herophydrus, id. *l. c.* pp. 392 & 861. Allied to *Cælambus*; elytral ligula abrupt on the posterior face, gradually raised in front; hind coxal cavities approximate; posterior portion of epipleura very narrow; humeral area of epipleura limited behind by a well-marked raised line. To include *Hyphydrus guineensis*, Aubé, and *H. heros* (Dej., MS.), pl. xii. fig. 144, p. 392, *verticalis*, *spadiceus*, Madagascar, p. 393, *obscurus*, Cape Town, and *oscillator*, Caffraria, p. 394: spp. nn.

Chostonectes, id. *l. c.* pp. 408 & 863. Placed after *Cælambus*; elytral ligula absent; posterior portion of epipleura comparatively broad; hind tibiæ with only the serial punctures on the infero-external face; posterior femora slender, with rounded outer angle. To include *Hydroporus nebulosus*, Macl., *gigas*, Boh., pl. xii. fig. 148, *H. bakewelli* and *Hyphydrus johnsoni*, Clark, and *C. sharpi* (Wehncke, MS.), New South Wales, Sidney, and *latus*, Victoria, *id. l. c.* pp. 408 & 409.

Antiporus, id. *l. c.* pp. 410 & 864. Placed after *Chostonectes*; posterior portion of epipleura comparatively broad; hind tibiæ punctured on the infero-external aspect; the true fourth joint of front tarsus scarcely visible. To include *Hydroporus femoralis*, Boh., *interrogationis*, *gravidus*, *gilberti*, and *blakii*, Clark, *wakefieldi* and *duplex*, Sharp, and *A. uncifer*, pl. xii. fig. 149, New Zealand, and *curtulus*, Sidney, spp. nn., *l. c.* pp. 411 & 412.

Macroporus, id. *l. c.* p. 416. Placed after *Necterosoma*; hind tibiæ only with serial punctures on the infero-external aspect; terminal portion of epipleura rather broad; hind femora stout, their postero-external angle sharply defined. To include *Hydroporus howitti*, *hamatus*, *gardneri*, Clark, pl. xii. fig. 151, and *M. lateralis*, West Australia, p. 417, *solidus*, King George's Sound, and *ruficeps*, Australia, p. 418: spp. nn.

Deronectes, id. *l. c.* pp. 418 & 865. Allied to *Hydroporus*; no ligula on

inner face of elytra; terminal portion of epipleura narrow; humeral area of elytra not limited behind by a raised line. To include about 50 species; among those previously known (most of which were described under *Hydroporus*), the following are figured:—*bicostatus*, Schaum, *carinatus*, Aubé, and *striatellus*, Lec., pls. xii. fig. 152, xiii. figs. 154 & 155; add *D. longipes*, Persia, *planicollis*, Asia Minor, p. 420, *doriæ*, Caucasus, p. 421, *scutellaris*, Cyprus, p. 426, *amurensis*, Irkutsk [!], p. 427, *princeps*, Sinai, p. 428, *seriatus*, Hedjaz, *arabicus*, Jeddah, p. 429, *islamiticus*, Kurdistan, *suavis*, Greece, p. 430, *indicus*, N. India, *abyssinicus*, pl. xii. fig. 153, Abyssinia, p. 431, *suffusus* and *prosternalis*, N. America, p. 434, spp. nn.; add *D. opaculis*, sp. n., *id.* Biol. Centr. Am. *Col.* i. (2) p. 27, Mexico.

Methles, id. *l. c.* pp. 489 & 873. Placed after *Celina*; scutellum concealed, base of thorax acuminate and produced in the middle, front and middle tarsi five-jointed, sub-cylindrical, basal joints not dilated, nor clothed beneath, third joint not bilobed; swimming legs feeble; extremity of body spinose. To include *M. spinosus*, Egypt, p. 489, *rectus*, Mesopotamia, and *punctipennis*, pl. xiii. fig. 162, p. 490, Lagos, Ashantee: spp. nn.

Hydrotrupes, id. *l. c.* pp. 492 & 875. Allied to *Agabus*; labial palpi very short and stout; their terminal joint subquadrate. Type, *H. palpalis*, sp. n., *l. c.* pl. xiii. fig. 163, California.

Metronectes, id. *l. c.* pp. 492 & 875. Coxal lines and border almost absent; antennæ and palpi short and stout; hind coxæ but little developed, short, the anterior border but little arched; wings of metasternum large. Type, *Agabus aubæi*, Perris (figured, pl. xiii. fig. 164).

Ilybiosoma, id. *l. c.* pp. 537 & 886. Placed after *Agabus*; hind coxæ large, with greatly arched upper border, wings of the metasternum very slender, parallel-sided, but much curved, swimming legs short and stout, epipleuræ narrow behind the middle. Type, *Agabus regularis*, Lec. (figured, pl. xiv. fig. 174).

Platynectes, id. *l. c.* pp. 538 & 887. Placed after *Ilybiosoma*; sides of prothorax with a raised margin, hind coxæ very large; wings of metasternum much reduced, slender and linear; hind legs rather long and slender; epipleuræ very narrow behind the middle. To include *Agabus reticulosus* and *latissimus*, Clark, *Dytiscus decempunctatus*, Fabr. (figured, pl. xiv. fig. 175), *A. dissimilis*, Sharp, *undecimpunctatus* (figured, *l. c.* fig. 176), *decemnotatus* and *nigerrimus*, Aubé, various other known species; *P. æneseens*, p. 538, *limbatus*, Australia, *obscurus*, Tasmania, p. 539, *dæmeli*, Australia, p. 542, *ornatifrons*, Brazil, p. 544, and *parananus*, Parana, p. 545: spp. nn.

Leuronectes, id. *l. c.* pp. 546 & 887. Placed after *Platynectes*; sides of prothorax without raised margin; coxal lines present. To include *Colymbetes gaudichaudi*, Lap. (figured, pl. xiv. fig. 177), probably *Agabus muelleri*, Kirsch, and *L. parallelus*, sp. n., *l. c.*, Colombia.

Agametrus, id. *l. c.* pp. 547 & 888. Placed after *Leuronectes*; side of prothorax without raised margin; coxal lines absent. Types, *Colymbetes peruvianus*, Cast. (figured, pl. xv. fig. 178), and *labratus* and *humilis*, spp. nn., *l. c.* p. 547, Venezuela.

Agabinus, id. *l. c.* pp. 548 & 888. Placed after *Agametrus*. Type, *Colymbetes glabrellus*, Motsch. (figured, pl. xv. fig. 179).

Aglymbus, id. *l. c.* pp. 596 & 893. Allied to *Copelatus*; coxal lines quite obliterated; upper surface sculptured with short lines. To include *C. rufipes*, Brullé, *Agabus leprieuri* (figured, pl. xv. fig. 189), and *palliditentris*, Aubé, and *A. sculpturatus*, Para, p. 596, *optatus*, Colombia, *gestroi* and *brevicornis*, Abyssinia, p. 597, spp. nn.

Agabetes, id. *l. c.* pp. 599 & 894. Allied to *Matus*; prothorax without lateral margin; upper surface densely sculptured; coxal lines conspicuous, parallel in front, greatly divergent behind, and marking off a large broad coxal border. Type, *Colymbetes acuductus*, Harr. (figured, pl. xvi. fig. 191).

Lancetes, id. *l. c.* pp. 602 & 897. Allied to *Agabus* and *Rhantus*; extremity of elytra sinuate-truncate; palpi scarcely if at all emarginate at the apex; coxal processes elongate, deeply divided, and much divergent. To include *Colymbetes lanceolatus*, Clark (figured, pl. xvi. p. 194), *nigriceps* (l. c. fig. 195), and *præmorsus*, Erichs., *Rhantus marginatus*, Steinh., and several other described species; add *L. unguicularis*, sp. n., *l. c.* p. 603, Chili.

Prodaticus, id. *l. c.* pp. 648 & 906. Allied to *Hydaticus*; coxal lobes broad, their supra-articular border rather narrow, claws of hind feet nearly equal in length. Type, *P. pictus*, sp. n., *l. c.* pl. xvii. fig. 206, N. India.

Œthionectes, id. *l. c.* pp. 684 & 910. Allied to *Thermonectes*; coxal lines distinct in their hinder portion, supra-articular border broad; middle femora with only short setæ. Type, *Œ. optatus*, sp. n., *l. c.* p. 685, pl. xvii. fig. 213, Guinea.

Rhantaticus, id. *l. c.* pp. 691 & 911. Allied to *Sandracottus*. Type, *Hydaticus signatipennis*, Lap. (figured, pl. xviii. fig. 215).

Spencerhydrus, id. *l. c.* pp. 701 & 916. Allied to *Homœodytes*; anterior border of hind coxæ approaching rather closely to the middle coxæ. To include *S. pulchellus*, p. 701, *latecinctus*, pl. xviii. fig. 219, and *semiflavus*, Australia, p. 702: spp. nn.

Homœodytes, id. *l. c.* pp. 703 & 916. Allied to *Cybister*; coxal lines absent; unguicular cleft broad and rounded at base. To include *Dytiscus atratus*, Fabr., *Cybister scutellaris*, Germ., and *hookeri*, White (figured, pl. xviii. fig. 220).

Megadytes, id. *l. c.* pp. 704 & 917. Allied to *Cybister*; coxal lines present; unguicular cleft narrow and angular at base; hind tarsi in ♂ terminated with two distinct claws (♀ always with two claws, but the inner one often rudimentary). To include several species described by authors under *Cybister* and *Trogus*, and *M. expositus*, fig. 221, Chili, p. 705, *fraternus*, fig. 222, pl. xviii., Panama, Guatemala, Guadeloupe, St. Domingo, Demerara, p. 708, *flohri*, Mexico, p. 709, *obesus*, Panama, p. 710, *perplexus*, S. America, p. 711, *gravidus*, p. 712, and *ducalis*, Brazil, p. 713: spp. nn.

Mesonoterus, id. Biol. Centr. Am. *Col.* i. (2) p. 4. Allied to *Pronoterus*; front legs shaped as in *Noterus*, but more slender; swimming-legs also more slender and less powerful. Type, *M. lævicollis*, sp. n., *l. c.* pl. i. fig. 2, Guatemala.

Haliplus solitarius, pl. i. fig. 1, and *signatus*, Sharp, Biol. Centr. Am. *Col.* i. (2) p. 2, Guatemala.

Hydrocoptus subfasciatus, pl. ix. fig. 108, Australia, p. 261, *vittatus*, [illegible]. India, Sarawak, and *seriatus*, Madagascar, p. 262, *id.* Tr. Dubl. Soc. (2) ii.

Noterus ponticus, id. *l. c.* p. 266, Mesopotamia.

Suphis subtilis, New Granada, Cumana, and *difformis* [cf. also Biol. Centr. Am. *Col.* i. (2) p. 5], pl. ix. fig. 113, Bahia, Santa Rita; *id. l. c.* p. 268.

Hydrocanthus oblongus, N. America, *texanus*, Texas, p. 280, *debilis*, Bahia, Amazons, *adrena*, Basseterre, p. 281, and *deyrollii*, Gaboon, p. 282, *id.* l. c.; *H. marmoratus*, id. Biol. Centr. Am. *Col.* i. (2), p. 8, Guatemala.

Laccophilus fusculus, Nevada, *insignis*, Texas, p. 290, *salvini*, Guatemala, p. 291, *confusus*, Mexico, *terminalis*, Texas, p. 292, *chilensis*, Chili, *tarsalis*, Parana, *suffusus*, Bahia, p. 293, *badeni* (Wehncke, MS.), Brazil, *nigricans*, Parana, p. 294, *simplex*, Brazil (Santa Rita), *remator*, Bahia, *traili*, Amazons, p. 295, *subsignatus*, Venezuela, Guadeloupe, *fumatus*, Brazil, *fractus*, *vagepictus*, Santa Rita, p. 297, *rotundatus*, Brazil, p. 298, *obesus*, Cayenne, *latipes*, Parana, p. 299, *sordidus*, Hedjaz, *elegans*, Andaman Islands, p. 302, *unifasciatus* (Wehncke, MS.), Rockhampton, Australia, *latifrons*, Santa Rita, *ovatus*, Brazil [*cf.* also Biol. Centr. Am. *Col.* i. (2) p. 14], p. 303, *pellucidus* (pl. x. fig. 119), Caffraria, *immundus*, Cape Town (?), p. 304, *sublineatus*, Hedjaz, Mesopotamia, *pictipennis*, Hedjaz, Abyssinia, *discretus*, Hedjaz, p. 305, *wehnckii*, Zanzibar, *siamensis*, Siam, *grammicus*, Abyssinia, p. 306, *brevicollis*, Cape, *lateralis*, *luctuosus*, Madagascar, p. 307, *cyclopis*, Cape Town, Caffraria, N'Gami, *complicatus*, Madagascar, p. 308, *medialis*, Siam, p. 309, *ponticus*, Mesopotamia, *obtusus*, Singapore, *derasus*, p. 311, *dispersus*, Siam, p. 312, *clarki* (Wehncke, MS.), *quadrimaculatus* (Wehncke, MS.), Australia, *lituratus*, *pulicarius*, Siam, p. 313, *cingulatus*, Australia, p. 314, *restrictus*, Egypt, *solutus*, China, p. 315, *cognatus*, India, *religatus*, Australia, and *addendus*, Madagascar, p. 316, *id.* Tr. Dubl. Soc. (2) ii.; *L. mistecus*, p. 9, *spergatus*, *fuscipennis*, p. 10, *oscillator*, Mexico, p. 11, *lævipennis*, Guatemala, *duplex*, Mexico, p. 12, *optatus*, Chontales, *suavis* [= *venustus*, Sharp, Tr. Dubl. Soc. (2) ii. p. 296], Mexico, p. 13, and *championi*, Guatemala, p. 14, *id.* Biol. Centr. Am. *Col.* i. (2).

Hydrovatus flammulatus, S. Africa, *maculatus*, Mesopotamia, *simplex*, S. Europe, p. 322, *longicornis*, Egypt, *pictulus*, Madagascar, p. 323, *brevipes*, California, *compressus*, New Orleans, p. 324, *caraibus*, Guadaloupe, p. 325, *fusculus*, Macassar, Formosa, China, *fasciatus* (Wehncke, MS.), Australia, p. 326, *sumatrensis*, Sumatra, *ovalis* (Wehncke, MS.), Brisbane, *sordidus*, Mesopotamia, Egypt, Arabia, *humilis*, Madagascar, p. 327, *elevatus*, Macassar, *tinctus*, Siam, *cribratus*, Gaboon, p. 328, *confertus*, *subtilis*, Siam, p. 329, *acutus*, Celebes, Sumatra, *fractus*, Siam, *crassulus*, Santa Rita, *parallelus*, Australia, p. 330, *pumilus*, Sumatra, India (?), *opacus*, p. 331, *politus*, Australia, *nigricans*, p. 332, *badeni* (Wehncke, MS.), Madagascar, *compactus*, Gaboon, *nigrita* (Wehncke, MS.), Australia, Philippines, p. 333, *bonvouloiri*, N. India, and *major*, pl. x. fig. 123, Guatemala, p. 335, *id.* Tr. Dubl. Soc. (2) ii.; *H. obscurus*, Guatemala, Panama, and *inornatus*, Oaxaca, *id.* Biol. Centr. Am. *Col.* i. (2) p. 15.

Desmopachria suturalis, *ovalis*, pl. x. fig. 126, Santa Rita, Brazil, *concolor*, Uruguay, p. 340, *lævis*, Santa Rita, and *subtilis*, Brazil, p. 341, *id.* Tr. Dubl. Soc. (2) ii.; *D. variegata*, Mexico, Guatemala, p. 16, *dispar*, *polita*, Mexico, p. 17, *circularis*, Guatemala, Mexico, *glabricula*, Guatemala, p. 18, and *mexicana*, Mexico, p. 19, *id.* Biol. Centr. Am. *Col.* i. (2).

Hyphydrus major, pl. xi. fig. 136, Lower Egypt, Nubia, *parvicollis*, Gaboon, p. 375, *africanus*, Senegal, p. 376, *stipes*, Madagascar, Bourbon, p. 377, *grossus*, Caffraria, Cape Town, p. 378, *signatus*, Guinea, *punctipennis*, Abyssinia, p. 379, *frontalis*, *lævicentris*, Japan, p. 381, and *indicus*, East Indies, p. 382, *id.* Tr. Dubl. Soc. (2) ii.

Calambus discedens, N. China, p. 396, *interruptus*, Mesopotamia, *muticus*, pl. xii. fig. 146, Abyssinia, *chinensis*, N. China, p. 398, *fumatus*, United States, p. 400, *infuscatus*, Nevada, p. 401, *sahlbergi* (= *unguicularis*, Sahlb., *nec* Crotch), Siberia, p. 402, *elevatus*, Egypt, p. 403, *inscriptus*, Persia, Mesopotamia, p. 404, *orthogrammus*, Persia, p. 405, *id. l. c.*

Necterosoma schmeltzi (Wehncke, MS.), pl. xii. fig. 150, Sidney, p. 414, *regulare*, and *arcuatum*, Australia, p. 415, *id. l. c.*

Hydroporus diversicornis, pl. xiii. fig. 156, Texas, p. 437, *integer*, Pennsylvania, p. 438, *cimicoides*, *lobatus*, N. America, p. 439, *scrutator*, Ega (?), *lynceus*, N. America, *peltatus*, Canada, p. 440, *clypealis*, Massachusetts, *anticus*, Pennsylvania, Louisiana, p. 441, *eruditus*, Philadelphia, *republicanus*, N. America, p. 442, *solitarius*, Massachusetts, p. 445, *libens*, Guatemala, p. 446, *mexicanus*, Mexico, p. 447, *nigritarsis* (Sahlb., MS.), N. Siberia, *laticulus*, Algeria, p. 453, *fractus*, S. Europe, Algeria, p. 454, *occultus*, Algeria, *occidentalis*, N. America, p. 456, *cantabricus*, Europe, *insularis*, p. 457, *revelierii*, Corsica, *teres*, p. 458, *ineptus*, Syria, *errans*, Canary Islands, *antidotus*, Syria, p. 462, *maurus*, Spain, *inscitus*, Mesopotamia, p. 463, *venator*, Tangier, Andalusia, p. 465, *sibiricus* (Sahlb., MS.), Irkutsk, &c., *despectus*, Canada, p. 466, *perplexus*, California, *rusticus*, Nevada, p. 467, *astur*, Spain, *alticola*, S. Europe, p. 468, *inornatus*, Massachusetts, *latifrons*, N. America, p. 478, *rufilabris*, Texas, p. 479, *nevadensis*, S. Spain, p. 481, *regularis*, Corsica, p. 482, *terminalis*, *hardii*, California, p. 484, *belfragii*, Texas, p. 485, *copelatoides*, Chili, and *advena*, Cape Town, p. 486, *id.* l. c.; *H. nebulosus*, Mexico, and *interjectus*, Guatemala, *id.* Biol. Centr. Am. *Col.* i. (2) p. 29.

Celina punctata, *gracilicornis*, p. 31, and *debilis*, p. 32, Guatemala, *id.* l. c.; *C. mucronata*, Constantia, *longicornis*, Santa Rita, p. 487, *picea*, *crassicornis*, Petropolis, and *bonvouloiri*, Cayenne, p. 488, *id.* Tr. Dubl. Soc. (2) ii.

Agabus caraboides, Syria or Mesopotamia, p. 494, *styriacus*, Styria, p. 496, *armeniacus*, Trebizond, Daghestan, p. 497, *perplexus*, California, Vancouver's Island, p. 498, *castaneus*, Syria, p. 500, *æqualis*, Transbaikal, *saffragi*, Abyssinia, p. 501, *marginalis*, Greece, Styria, p. 502, *planatus*, N. America, p. 503, *texanus*, Texas, p. 505, *stridulator*, Hudson's Bay, Canada, p. 509, *borealis* (= *dissimilis*, Sahlb.), Siberia, *mutus*, Hudson's Bay, p. 513, *subfuscatus*, Massachusetts, p. 514, *austini* (Crotch, MS.), British Columbia, p. 516, *sahlbergi*, Dauria, p. 517, *sibericus*[*-bi-*], Eastern Siberia, p. 519, *wollastoni*, Madeira, p. 531, *coxalis*, Angara, Lapland,

p. 535, and *clavicornis*, Eastern Siberia, p. 536, *id.* l. c. ; *A. spinipes*, and *amaroides*, id. Biol. Centr. Am. *Col.* i. (2) pp. 32 & 33, Mexico ; *A. discicollis*, Ancey, Nat. Sicil. i. p. 70, Abyssinia.

Ilybius inversus, N. America, p. 554, *limbatus*, Eastern Siberia, *discedens*, pl. xv. fig. 181, Hudson's Bay, p. 557, *obtusus*, Eastern Siberia, p. 558, *oblitus*, N. America, and *cinctus*, Yanghi-Hissar, p. 560, Sharp, Tr. Dubl. Soc. (2) ii.

Copelatus filiformis, Himalaya, p. 563, *hydroporoides*, New Caledonia, *gracilis*, fig. 183, Rockhampton, p. 564, *ferrugineus*, Port Denison, *lividus*, Adelaide, Melbourne, *labratus*, Melbourne, Victoria, p. 565, *ater*, Swan River, &c., *extensus*, Brisbane, *maculatus* (Wehncke, MS.), New Caledonia, p. 566, *melanarius*, Clarence River, *nigritulus*, fig. 184, Australia, Tasmania, p. 567, *subjectus*, New Caledonia, *politus*, New Guinea, p. 568, *inornatus*, S. America (?), *atriceps*, Algeria, Corsica, p. 569, *dimorphus*, Parana, *longicornis*, Santa Rita, p. 570, *restrictus*, Monte Video, *sexstriatus*, Colombia, *punctulatus*, fig. 185, Santa Rita, *prolixus*, Amazons, p. 571, *tibialis*, Brazil, *nitidus*, Colombia, p. 572, *coxalis*, Amazons, p. 563, *inæqualis* (Chevr., MS.), Colombia, *mundus* [cf. also Biol. Centr. Am. *Col.* i. (2) p. 35]. Mexico, *consors*, Pampas, p. 574, *neglectus*, Venezuela (*cf.* also *l. c.* p. 37), *concolor*, Amazons, p. 575, *alternatus*, *convouloiri*, Brazil, p. 576, *nigro-lineatus*, Australia, *interruptus* (? Perroud), fig. 186, New Caledonia, p. 577, *capensis* (Chevr., MS.), Caffraria, *doriæ*, Sarawak, p. 578, *debilis*, Chontales, Guatemala, *marginatus* (Wehncke, MS.), Australia, p. 579, *latipes*, Malacca, *pusillus*, Siam, *fuscipennis*, Celebes, p. 580, *gentilis*, Bachian, *geniculatus*, Malay Archipelago, p. 581, *oblitus*, Singapore, *indicus*, India, *discoideus*, *strigulosus*, Mesopotamia, p. 582, *africanus*, N'gami, p. 583, *validus*, Chontales, p. 584, *clarki* (Wehncke, MS.), Cape York, *carinatus*, Guinea, *prolongatus*, Panama, p. 585, *nigricans*, New Granada, *polystrigus*, Madagascar, Senegal, p. 586, *obscurus*, Amazons, p. 587, *terminalis* (cf. also *l. c.* p. 39, pl. i. fig. 9), *depressus*, p. 588, *impressicollis* (? = *distinctus*, Aubé ; *cf.* l. c. p. 40, pl. i. fig. 10), Guatemala, p. 589, *advena*, S. America (?), *integer*, Chontales, p. 590, (*cf.* also *l. c.* p. 40), *exaratus*, Amazons, p. 591, *sulcatus*, Upper Amazons, *badeni* (Wehncke, MS.). Fiji, p. 592, *dæmeli* (Wehncke, MS.), Cape York, *perfectus*, New Caledonia, p. 593, and *oberthueri*, Para, p. 594, *id. l. c.* pl. xv. ; *C. biformis*, Mexico, p. 34, *laccophilinus*, Panama, *sallei*, p. 35, *solitarius*, Mexico, *proximus*, Guatemala, p. 36, *basalis*, p. 37, *incognitus*, *læticulus*, Mexico, p. 38, and *fragilis*, Guatemala, p. 40, *id.* Biol. Centr. Am. *Col.* i. (2).

Trochalus æneopiceus, Fairmaire, CR. Ent. Belg. xxvi. p. xlvii, Zanzibar ; *T. margaritaceus*, Lansberge, *op. cit.* p. xxiii., Abyssinia.

Lacconectus basalis, Sharp, Tr. Dubl. Soc. (2) ii. p. 598, pl. xvi. fig. 190, Siam, Cambodia.

Mœtus dæmeli, id. *l. c.* p. 600, Sydney.

Coptotomus obscurus, id. *l. c.* p. 601, Texas, Florida.

Rhantus debilis, Tahiti, *annectens*, Navigator's Islands, *plantaris*, New Zealand, p 608, *elevatus*, Hedjaz, p. 609, *remator*, pl. xvi. fig. 197, *advena*, Peru, p. 611, *longipes*, Alaska, British Columbia, p. 612, *obscurus*, California, *suffusus*, Mexico, *plebeius*, N. America, p. 613, *discedens*, Cali-

fornia, p. 615, *sericans*, British Columbia, p. 619, *latitans*, Germany, Belgium, p. 621, *hispanicus*, Spain, p. 622, *goudoti* (Dej., MS.), Madagascar, p. 623, and *validus*, Chili, p. 624, *id. l. c.*

Colymbetes crotchi, California, p. 626, *rugipennis*, Nebraska, *thomsoni*, Lapland, Iceland, Greenland (?) p. 628, *substrigatus*, Arabia, *vagans*, N. Persia, p. 630, and *procerus*, Arabia, p. 631, *id. l. c.*

Hyderodes crassus and *collaris*, id. *l. c.* pp. 633 & 634, Australia.

Dytiscus vexatus, North-Western North America, p. 643, *latro*, Manchuria, and *piceatus*, Irkutsk, p. 644, *id.* l. c.; *D. zersi*, Sordelli, Rend. Ist. Lomb. (2) xv. pp. 137–139, fig. 6, and Bull. Ent. Ital. xiv. p. 232, fig. Fossil, from the lacustrine deposits of Morla, near Bergamo.

Hydaticus modestus, p. 650, *americanus*, N. America, p. 651, *rectus*, Parana, *amazonicus*, Upper Amazons, p. 655, *dineutoides*, Sarawak, p. 657, *concolor*, Cochin China, p. 661, *ponticus*, Mesopotamia, p. 662, *agaboides*, Cochin China, p. 663, *rhantoides*, Japan, Formosa, Manchuria, China, p. 664, *dæmeli* (Wehncke, MS.), Australia, p. 668, *rectangulus*, Persia, Punjab, and *duplex*, Borneo, p. 669, Sharp, *l. c.*

Thermonectus depictus (Reiche, MS.), Colombia, p. 679, *simulator*, Parana, p. 681, *cuneatus*, Panama, and *batesi*, Upper Amazons, p. 682, *id. l. c.*

Sandracottus guttatus, Australia, *rotundus*, Celebes, p. 688, *ornatus*, p. 689, and *nauticus*, Borneo, p. 690, *id. l. c.*

Graphoderes perplexus, N. America, and *elatus*, Amurland, N. America, *id. l. c.* p. 695.

Cybister siamensis, Siam, Andamans, p. 717, *prolixus*, Ceylon, *convexus*, East Indies, p. 718, *filicornis*, Gaboon, Guinea, p. 719, *deplanatus*, Cameroons, Cape Coast Castle, *operosus* (Dej., MS.), Madagascar, p. 720, *insignis*, Gaboon, p. 722, *modestus*, Cameroons, Gaboon, p. 725, *cinctus*, Madagascar, p. 730, *asiaticus*, India, Persia, Mesopotamia, *fumatus*, Siam, Malay Peninsula, p. 731, *crassipes*, Arabia, *tibialis*, Madagascar, p. 735, *pectoralis*, Deccan, p. 736, *wehnckianus*, India (?), *cephalotes*, Abyssinia, p. 737, *dytiscoides*, Madagascar, p. 738, *confusus*, India, Ceylon, China, p. 739, *gracilis*, India, *ventralis*, Madras, p. 742, *crassus*, Sylhet, p. 743, *cognatus*, Java (?), p. 744, *celebensis*, Celebes, p. 745, and *ponticus*, Mesopotamia, p. 748, *id. l. c.*

Gyrinidæ.

Régimbart, M. Essai monographique de la famille des *Gyrinidæ*. 1ière partie. Ann. Soc. Ent. Fr. (6) ii. pp. 379–468, pls. x.–xii.

This paper is preceded by notes on anatomy, transformations, &c. The author divides the *Gyrinidæ* into the three tribes *Enhydrini*, *Gyrinini*, and *Orectochilini*, of which only the first is discussed at present. Details of a considerable number of species are figured.

Dineutes truncatus, Sharp, and *Gyretes lionotus*, Aubé, figured; Sharp, Biol. Centr. Am. *Col.* i. (2) pl. i. figs. 15 & 16.

Macrogyrus, g. n., Régimbart, Ann. Soc. Ent. Fr. (6) ii. p. 432. Allied to *Enhydrus*; suture of first two abdominal segments oblique, completely effaced on the outer half, ♂ with first joint of the front tarsi consider-

ably larger than the second, and provided below with a cupolated disk. 27 species from Western S. America, Australia, &c., are referred to this genus, of which the following are new:—*M. sedilloti*, Venezuela, Ecuador, *borrii*, fig. 55, Ecuador, p. 436, *seriatopunctatus*, Peru, p. 437, *blanchardi*, p. 442, *oberthueri*, New Guinea, p. 446, *elongatus*, Aru, Australia, *simoni*, fig. 60, New South Wales, p. 447, *angustatus*, p. 448, *canaliculatus*, p. 450, *longipes*, Australia, p. 452, *purpurascens*, fig. 63, New Guinea, p. 453, and *paradoxus*, fig. 64, pl. xii., Australia, p. 455.

New species :—

Enhydrus sumbawæ, Sumbawa, and *æneseens*, Timor, Régimbart, Notes Leyd. Mus. iv. pp. 59 & 60.

Gyrinus siculus, Ragusa, Nat. Sicil. i. p. 225, Sicily; *G. turbinator*, Sharp, Biol. Centr. Am. *Col.* i. (2) p. 50, Mexico, Guatemala.

Dineutes fairmairii, Fiji, p. 394, *hypomelas*, Amboina, *caliginosus*, Australia, p. 397, *mellii* (Chevrolat, MS.), China, p. 399, *olivaceus* (Dej., MS.), p. 401, *denticulatus*, figs. 28, 28*a*, & 28*b*, Madagascar, &c., p. 402, *dilatatus*, figs. 29, 29*a*, pl. xi., Madagascar, p. 403, *abyssinicus*, Abyssinia, *angolensis*, p. 407, *wehnckii*, Angola, p. 409, *analis*, figs. 38, 38*a*, Louisiana, Texas, p. 416, *pectoralis*, fig. 42, p. 419, *sharpi*, fig. 44, pl. xii., Guinea, Zambesi, p. 422, Régimbart, Ann. Soc. Ent. Fr. (6) ii.; *D. regimbarti* (Ritsema, MS.), Timor, and *ritsemæ*, North Celebes, *id.*, Notes Leyd. Mus iv. pp. 61 & 62.

Gyretes scaphidiformis, Bogota, p. 69, *glabratus*, and *pygmæus*, Brazil, p. 70, *id.* l. c.; *G. boucardi* (Sallé, MS.), Mexico, p. 51, *proximus*, Costa Rica, and *acutangulus*, Mexico, p. 52, Sharp, *l. c.*

Orectochilus validus, North Celebes, *conspicuus*, Ceylon, *bipartitus*, *lucidus*, *ritsemæ*, Java, and *suturalis*, Natal, Régimbart, *l. c.* pp. 63–68.

Hydrophilidæ.

Sharp, Biol. Centr. Am. *Col.* i. (2), figures the following known species of *Hydrophilidæ*:—*Hydrophilus insularis*, Cast., fig. 1, *Tropisternus apicipalpis*, Chevr., fig. 2, *mexicanus*, Cast., fig. 3, *ovalis*, Cast., fig. 5, *Helopeltis larvalis*, Horn, fig. 15, pl. ii., *Epimetopus costatus*, Lec., fig 3, and *Pelosoma lafertoi*, Muls., fig. 14, pl iii.

Hydrophilus. Dimmock describes the circulation of the blood in the head of the larva; Psyche, iii. pp. 324–326, fig. 5.

Hydrous caraboides, monstrosity; Everts, Tijdschr. Ent. xxv. p. xviii.

Hydrobius fuscipes, Linn., var. *balearicus*, from Mallorca, described; Schaufuss, Nunq. Ot. iii. p. 528. *H. morenæ*, Heyd., belongs to *Philydrus*; id. Bull. Soc. Ent. Fr. (6) ii. p. clxxiii.

Laccobius. Dutch species noticed; Everts, *l. c.* p. xviii.

Spercheus emarginatus. Larva described and details figured; Fowler, Ent. M. M. xix. pp. 79–82.

Helophorus porculus, Bedel, redescribed; Schaufuss, Nunq. Ot. iii. pp. 528 & 529.

Ochthebius bicolor, Germ., is named in some collections *O. quadrifossulatus*, Waltl, and *numidicus*, Reitt., *O. submersus*, Chevr., is European, being found at Versailles; Schaufuss, Bull. Soc. Ent. Fr. (6) ii. p. lxxxiv.

O. abyssinicus, Reitt., is quite distinct from *bicolor*, Germ.; Reitter, Wien. ent. Zeit. i. p. 170.

Hydræna pallidipennis, Cast., = *Ochthebius marinus*, Payk., and *H. striata*, Cast., = *O. bicolor*, Germ. (*rufo-marginatus*, Steph.); Von Heyden, Bull. Soc. Ent. Fr. (6) ii. pp. xii. & xiii.

New genera and species:—

Oocyclus, Sharp, Biol. Centr. Am. *Col.* i. (2) p. 61. Allied to *Hydrobius*, but with a superficial resemblance to *Cyclonotum*; to include *O. vestitus*, Mexico, p. 62, *brevicornis* (type), pl. ii. fig. 9, and *maculatus*, Guatemala, p. 63: spp. nn.

Metacymus, id. *l. c.* p. 65. Allied to *Anacæna*; head broad, dilated before the eyes; labrum scarcely visible; antennæ seven-jointed, and very short. Type, *M. parvulus*, sp. n., *l. c.* p. 66, Chiriqui.

Hydrocombus, id. *l. c.* p. 70. Allied to *Cymbiodyta*, but with a transverse elevation on the mesosternum. To include *H. brevicollis* and *fraterculus*, Mexico, p. 71, and *politus*, pl. ii. fig. 10, Guatemala, p. 72: spp. nn.

Sindolus, id. *l. c.* p. 72. Allied to *Philydrus* and *Helochares*: lamina of the mesosternum largely developed; maxillary palpi elongate; elytra with a sutural stria. Types, *S. optatus*, pl. ii. fig. 12, Guatemala, and *rundus*, Mexico, spp. nn., *l. c.* pp. 72 & 73.

Chasmogenus, id. *l. c.* p. 73. Allied to *Helochares*; mentum with a broad curved emargination in front. Type, *C. fragilis*, sp. n., *l. c.* pl. ii. fig. 13, Guatemala, Panama.

Derallus, id. *l. c.* p. 77. Allied to *Volvulus*; abdomen with five external segments; antennæ seven-jointed. Type, *D. angustus*, sp. n., *l. c.* p. 78, pl. ii. fig. 16, Guatemala.

Hemiosus, id. *l. c.* p. 84. Allied to *Berosus*; palpi short; body beneath and femora with a peculiar silky opacity. Type, *H. maculatus*, sp. n., *l. c.* p. 85, pl. iii. fig. 2, Guatemala.

Phænonotum, id. *l. c.* p. 97. To include *Hydrophilus estriatus*, Say, and *P. dubium*, Mexico, Guatemala, Costa Rica, *apicale*, Guatemala, Nicaragua, *tarsale*, fig. 8, Panama, p. 98, *collare*, Mexico, Guatemala, *lævicolle*, Mexico, Guatemala, Nicaragua, p. 99, and *rotundatum*, fig. 9, Mexico, Guatemala, Panama, p. 100, pl. iii.: spp. nn.

Cyclotypus, id. *l. c.* p. 100. Allied to *Cyclonotum*; types, *C. godmani*, pl. iii. fig. 10, Chiriqui, and *latissimus*, Chontales, spp. nn., pp. 100 & 101.

Perochthes, id. *l. c.* p. 101. Intermediate between *Cyclonotum* and *Cercyon*; type, *P. globulus*, sp. n., *l. c.* p. 102, pl. iii. fig. 11, Mexico, Guatemala.

Hetercyon, id. *l. c.* p. 103; type, *H. depressus*, sp. n., *l. c.*, Mexico.

Nitidulodes, id. *l. c.* p. 112. Allied to *Pelosoma*; type, *N. jansoni* sp. n., *l. c.* pl. iii. fig. 15, Chontales.

Oosternum, id. *l. c.* p. 112. Intermediate between *Cercyon* and *Cryptopleurum*; type, *C. costatum*, sp. n., *l. c.* p. 113, pl. iii. fig. 16, Mexico, Guatemala, Nicaragua.

Deltostethus, id. *l. c.* p. 114. Between *Oosternum* and *Cryptopleurum*; types, *D. sulcatus*, pl. iv. fig. 2, Guatemala, Panama, and *palpalis*, Chiriqui, spp. nn., *l. c.* pp. 114 & 115.

Tropisternus crassus, Guatemala, *brevicollis*, fig. 4, Mexico, p. 56, *concolor*, Mexico, Guatemala, *chontalensis*, Chontales, p. 57, *oculatus*, fig. 5, Mexico, Colombia, *fuscitarsis*, Mexico, Guatemala, p. 58, *xanthopus*, *tinctus*, Mexico, p. 59, and *obscurus*, fig. 7, Guatemala; Sharp, Biol. Centr. Am. *Col.* i. (2) pl. ii.

Hydrocharis perfectus, id. *l. c.* p. 61, pl. ii. fig. 8, Guatemala.

Sternolophus punctulatus, Egypt, *elongatus* and *frater*, Abyssinia, Schaufuss, Bull. Soc. Ent. Fr. (6) ii. p. cxc.

Hydrobius armatus, Guatemala, Nicaragua, and *debilis*, Mexico, Guatemala, Panama, Sharp, *l. c.* pp. 64 & 65.

Philydrus discedens, Mexico, *mexicanus*, pl. ii. fig. 11, Mexico, p. 67, *nigellus*, Mexico, *æqualis*, Mexico, Guatemala, Nicaragua, p. 68, *debilis*, Guatemala, and *obscurus*, Mexico, p. 69; *id. l. c.*

Helochares oculatus, Guatemala, p. 74, *sallæi*, Mexico, *championi*, pl. ii. fig. 14, Guatemala, Nicaragua, p. 75, *seriatus*, Guatemala, *regularis*, Mexico, and *bipunctatus*, Mexico, Guatemala, p. 76; *id. l. c.*

Berosus salvini, pl. iii. fig. 1, Mexico, Guatemala, p. 79, *griseus*, Guatemala, *puncticollis*, p. 80, *falcatus*, p. 81, *flavicornis*, *mexicanus*, p. 82, *metalliceps*, Mexico, *gracilipes*, p. 83, and *mœrens*, Mexico, Guatemala, p. 84; *id. l. c.*

Limnocharis sinuatus, id. *l. c.* p. 86, Guatemala.

Limnebius simplex, Baudi, Nat. Sicil. i. p. 127, Sicily.

Chætarthria bicolor, Guatemala, *punctulata*, Mexico, *glabra*, Chontales, *læticula*, p. 87, and *pusilla*, Guatemala, p. 88, Sharp, *l. c.*

Helophorus regularis, id. *l. c.* p. 89, Mexico.

Hydrochus debilis and *obscurus*, id. *l. c.* pp. 89 & 90, Guatemala.

Ochthebius opacus, Baudi, *l. c.* p. 129, Sicily; *O. crassipes*, pl. iii. fig. 4, Guatemala, p. 90, *parvulus*, Mexico, *apicalis*, p. 91, *similis*, Guatemala, and *obscurus*, Mexico, p. 92, Sharp, *l. c.*

Hydræna longicollis, fig. 5, Guatemala, Nicaragua, *puncticollis*, p. 93, *sordida*, and *brevis*, fig. 6, Guatemala, p. 94, *id. l. c.* pl. iii.

Cyclonotum dispar, Mexico, p. 95, *grossulum*, pl. iii. fig. 7, Guatemala, *centrale*, Chiriqui, p. 96, and *tibiale*, Guatemala, p. 97, *id. l. c.*

Cercyon seriatus, Chiriqui, *mexicanus*, Mexico, p. 104, *insignis*, fig. 12, Guatemala, *politus*, Mexico, p. 105, *ebeninus*, Guatemala, *integer*, Mexico, Guatemala, p. 106, *variegatus*, fig. 13, North and Central America, *subsignatus*, p. 107, *armatus*, Guatemala, and *striatus*, Chiriqui, p. 108, *id. l. c.* pl. iii.

Pelosoma sordidum, Mexico, Guatemala, p. 109, *prosternale*, Mexico, *carinatum*, p. 110, *cercyonoides*, Guatemala, and *subcarinatum*, Chiriqui, p. 111, *id. l. c.*

Megasternum strigicolle, id. *l. c.* p. 113, pl. iv. fig. 1, Guatemala, Nicaragua.

Cryptopleurum impressum, id. *l. c.* p. 115, Mexico.

Staphylinidæ.

Rey, M. C. Tribu des Brévipennes. Ann. Soc. L. Lyon (2) xxviii. pp. 134–308.

Includes 13me famille: Habrocériens, and part of the 14me famille

Tachyporiens (subdivided into Hypocyptaires and Tachyporaires, the latter again divided into Tachyporates and Bolitobiates), as far as the genus *Drymoporus*, Thoms.

Critical list of the *Staphylinidæ* described by Fabricius in his Systema Eleutheratorum; Fauvel, Rev. d'Ent. i. pp. 211–214.

On the structure and affinities of the *Staphylinidæ*; Everts, Tijdschr. Ent. xxv. pp. cxxxii. & cxxxiii.

List of *Staphylinidæ* of Sarepta; Becker, Bull. Mosc. lvii. (1) pp. 50 & 51. List of species collected by Montandon in the Moldavian Carpathians; Fauvel, *l. c.* i. pp. 19–21.

Fauvel's descriptions of S. Australian *Staphylinidæ*, translated; Holder, Tr. R. Soc. S. Austr. iv. pp. 77–97 (*cf.* also p. 141).

Aleocharides.

Leptusa heydeni, sp. n., Eppelsheim, Deutsche E. Z. xxvi. p. 44, Andalusia.

Ilyobates crassicornis, sp. n., Quedenfeldt, B. E. Z. xxvi. p. 181, Morocco.

Tachyporides.

[redacted]*cyptus*, Horn, (preoccupied), renamed by him *Micrecyptus*; Tr. Am. Ent. Soc. x. p. i.

Hypocyptus aprilis, sp. n., Rey, Ann. Soc. L. Lyon (2) xxviii. p. 155, Hyères.

Typhlocyptus atomus, sp. n., *id. l. c.* p. 169, Nice.

Conurus crypticola, sp. n., *id. l. c.* p. 179, Aude.

Staphylinides.

Quedius pineti, Bris., probably = *maurorufus*, var.; Schaufuss, Nunq. Ot. iii. p. 560.

Xantholinus linearis, var. *maghrebinus* from Mogador described; Quedenfeldt, B. E. Z. xxvi. p. 182.

Velleiopsis, g. n., Fairmaire, Bull. Soc. Ent. Fr. (6) ii. p. clxiv. Allied to *Velleius*; antennæ simple, very slender at tip. Type, *V. marginiventris*, sp. n., *l. c.*, Varna.

New species :—

Staphylinus (*Ocypus*) *impennis*, Fauvel, Rev. d'Ent. i. p. 130, Abyssinia.

Ocypus milleri, Quedenfeldt, B. E. Z. xxvi. p. 182, Syria.

Quedius eppelsheimi, Algesiras, and *iridicolor*, Tetuan, *id. l. c.* p. 181.

Philonthus sanguinipennis and *brunneipennis*, id. *l. c.* p. 182, Morocco.

Pachycorinus dimorphus, Fauvel, *l. c.* p. 92, New Zealand. Remarkable for its dimorphism, the eyes and elytra being rudimentary in some examples.

Othius pilifer, Tetuan, and *paralleliceps*, Tetuan and Algesiras, Quedenfeldt, *l. c.* pp. 182 & 183.

Pæderides.

Glyptomerus cavicola, Müll., and *etruscus*, Picc., differentiated; Joseph, B. E. Z. xxvi. pp. 33–43.

Dolicaon biguttulum, var. *hilaris* from the Balearic Islands described; Schaufuss, Nunq. Ot. iii. p. 529.

Pinophilus erythrostomus, sp. n., Costa, Rend. Acc. Nap. xvi. p. 194, Sardinia.

Stenides.

Tetratarsus plicatulus, Schauf., is not one of the *Pselaphidæ*, but belongs to the genus *Edaphus*, Lec., in the *Evæstheti*; Fauvel, Rev. d'Ent. i. p. 138.

Edaphus dissimilis, Aubé, noticed; Rey, Ann. Soc. L. Lyon (2) xxviii. pp. 130 & 131.

Stenus dobberti, sp. n., Quedenfeldt, B. E. Z. xxvi. p. 183, Morocco.

Oxytelides.

Osorius cordicollis, sp. n., Fauvel, Notes Leyd. Mus. iv. p. 58, Sumatra.

Compsochilus weberi, Morocco, and *filiformis*, Algesiras, spp. nn., Quedenfeldt, B. E. Z. xxvi. p. 183.

Deleaster pectinatus, sp. n., Fauvel, Rev. d'Ent. i. p. 129, Abyssinia.

Phlœocharides.

Scotodytes, Saulcy, does not belong to the *Scydmænidæ*, but = *Phlœocharis*, Mannerh.; Fauvel, Rev. d'Ent. i. p. 138.

Pselaphidæ.

Raffray, A. Psélaphides nouveaux ou peu connus. Rev. d'Ent. i. pp. 1–16, 25–40, 49–64, 73–85, pls. i. & ii.

Includes a great number of new genera and species.

Schaufuss, L. W. The *Pselaphidæ* and *Scydmænidæ*, from the Sunda Islands, in the Leyden Museum. Notes Leyd. Mus. iv. pp. 145–157.

Contains notes on various known species (chiefly of Schaufuss) in addition to descriptions of new ones.

——. Pselaphiden und Scydmæniden der Niederländischen Besitzungen auf den Sunda-Inseln, im Reichs-Museum zu Leiden. Tijdschr. Ent. xxv. pp. 65–76.

Most of the species noticed in this paper are from Java. It appears to be a repetition of the last.

Reitter, Ins. Deutschl. iii. pp. 10–139, divides the *Pselaphidæ* as follows:—*Ctenistini* (*Chennides*, *Ctenistides*, and *Tyrides*), *Batrisini*, *Bryaxini*, *Pselaphini*, and *Euplectini* (*Euplectides*, *Trichony*[*ch*]*ides* and *Faronides*).

Schaufuss, Bull. Soc. Ent. Fr. (6) ii. pp. cxvii. & cxviii., remarks as follows on various *Pselaphidæ* described by Motschulsky:—*Bryaxis brevicornis* = *rufa*, Schmidt; *fulva* is distinct from *gorii*, Aubé; *rufa* = *cordata*, Schauf. (from which *baumeisteri* and *mamilia*, Schauf., are distinct), *sphærica* = *siamensis*, Schauf. (but *fonensis*, Schauf., is distinct); *Batrisus plicatus*, amended description; *Filiger* and *Hybocephalus* are distinct.

[redacted]wing genera of *Pselaphidæ* are distinct: — *Canthoderus*, [redacted] and *Stratus*, Schauf.; *Jubus* and *Gamba*; *Tmesiphorus* and *Tmesiphoroides*, Motsch.; *Callithorax*, Motsch., = *Pselaphus*, Herbst, not *Curculionellus*; *Bryaxis syriaca*, Reitt., *nec* Baudi, renamed *reitteri*; *B. pulla*, Raffr., *nec* Sharp, renamed *parva*; *Batrisus spinicollis*, Raffr., *nec* Motsch., renamed *spinifer*; Schaufuss, *l. c.* pp. clxvi. & clxvii.

Pselaphodes, Westw. (?). Generic characters of 2 Malayan species doubtfully referred to this genus discussed; Raffray, Rev. d'Ent. i. pp. 14 & 15.

Tychus erythropterus, Schmidt, = *ibericus*, Motsch.; Reitter, Wien. ent. Zeit. i. p. 167. *T. quadriforcolatus*, Motsch., redescribed; Schaufuss, *l. c.* p. cxiii.

Epicaris, Schauf., is renamed *Taphrostethus*; id. *l. c.* p. cli.

Batrisus, Aubé. Reitter divides this genus into 4 subgenera (2 new) of which he gives a table. He also gives a table of allied genera; Deutsche E. Z. xxvi. pp. 133, 134, & 139–141. *B. orion*, Schauf., = *coronatus*, Westw.; *id.* Wien ent. Zeit. i. p. 199. *B. anthicus*, Motsch., redescribed; Schaufuss, *l. c.* p. cxii. *Abatrisops*, Reitt., = *Tribatus*, Motsch.; Reitter, *l. c.* p. 67.

[redacted]*sius*, Schauf. Structure discussed; *id.* Deutsche E. Z. xxvi. pp. 147 & 148.

Metaxoides, Schauf., = *Mestogaster*, Schmidt; *id.* Wien. ent. Zeit. i. p. 170. Denied by Schaufuss, *l. c.* p. cxvii.

Bryaxis, Leach. Raffray discusses and tabulates various groups of this genus; Rev. d'Ent. i. pp. 30–32. Gredler criticises recent publications on this genus; Z. Ferd. (3) xxvi. pp. 219 & 220, note. *B. siamensis* and *cordata*, Schaufuss, noticed by him from Java; Tijdschr. Ent. xxv. pp. 68 & 69; Notes Leyd. Mus. iv. p. 148. *B. coronatus* and *auritulus*, Westw., belong to *Batrisus*; Reitter, *l. c.* p. 68.

Gonatocerus communis, Schauf., = *Bryaxis basalis*, King; *id. l. c.* p. 68. Schaufuss maintains their distinctness, *l. c.* p. civ.

Parmipalpus, Broun. Maxillary palpi described by him; N. Z. J. Sci. i. p. 288.

Euplectus fauveli, Raffr., belongs to *Octomicrus*, Schauf.; Reitter, *l. c.* p. 168. *E. boncoulouri*, Reitter, noticed; Ragusa, Nat. Sicil. i. p. 228.

Zibus adustus, Reitter, noticed; *id. l. c.* pp. 228 & 229.

Pselaphanax setosus, Walker, figured by Waterhouse, Aid, ii. pl. cxx.

Clavigerodes abyssinicus, Raffr., discussed and figured; Raffray, Rev. d'Ent. i. pp. 2 & 3, pl. i. fig. 4.

New genera and species:—

Apharus, Reitter, Deutsche E. Z. xxvi. p. 129. Allied to *Hamotus*, Aubé; antennæ thicker, more approximating, thorax with no transverse furrow at the base; abdomen with the first segment long, as in *Batrisus*; tarsi with two equal claws. Type, *A. muelleri*, sp. n., *l. c.* p. 130, pl. v. fig. 4, Brazil (San Paulo).

Gasola, id. *l. c.* p. 150. Allied to *Sagola*, Sharp, and *Faronus*, Aubé; type, *G. simoni*, sp. n., *l. c.* p. 151, pl. v. fig. 1, San Paulo.

Connodontus, Raffray, Rev. d'Ent. i. p. 52. Allied to [redacted] approaches *Pselaphus* by its long palpi; labrum very large, and [redacted] the mandibles to an extent unusual in the *Pselaphidæ*. Type, C. *acuminatus*, sp. n., *l. c.* p. 53, pl. ii. figs. 17 & 18, Bogos.

Atheropterus, id. *l. c.* p. 77. Allied to *Trichonyx*; abdomen not margined; palpi well developed; tarsi one-jointed. Type, *A. longipalpis*, sp. n., *l. c.* p. 78, Bogos.

Batrisodes, Reitter, Deutsche E. Z. xxiv. p. 134, Ins. Deutschl. iii. p. 29. Subgenus of *Batrisus*; points of the lateral angles of the first dorsal segment extending almost to its extremity; terminal joint of palpi long, spindle-shaped, broad at the base, and pointed towards the tip; all the four dorsal segments with fine sublateral ridges; thorax with two longitudinal furrows and distinct basal spines; elytra with short dorsal stripes. Types, *B. delaportii*, Aubé, *venustus*, Reichenb., *advenus*[*-na*] and *exsculptus*, Hampe, and *oculatus*, Aubé.

Syrbatus, id. Deutsche E. Z. xxiv. p. 134. Subgenus of *Batrisus*; differs from *Arthmius*, Lec., in the thorax having two lateral furrows [for examples see *infrà*, p. 54].

Simus, Raffray, *l. c.* p. 6. Allied to *Rhexius*, but antennæ only eight-jointed; type, *S. fracticornis*, sp. n., *l. c.* Bogos.

Ogmocerus, id. *l. c.* p. 7. Allied to last; antennæ eleven-jointed and legs very large. Type, *O. giganteus*, sp. n., *l. c.* pl. ii. fig. 7, Bogos.

Batrisomorpha, id. *l. c.* p. 38. Intermediate between *Bryaxis* and *Batrisus*; facies of the latter; prothorax shorter, not channelled; tarsi with one long claw; abdomen convex, sloping behind, segments not annulated, the first segment much the longest. To include *Bryaxis armitagii*, King (= *Batrisus pallidus*, Schauf., MS.), and *B. foveicollis*, Java, p. 39, *clavata* and *pilosella*, p. 40, and *crassicornis*, New Guinea, p. 49: spp. nn.

Stictus, id. *l. c.* p. 49. Differs from *Batrisus* by the single tarsal claw; from *Batrisomorpha* by the nearly cylindrical abdomen, not sloping behind, with the segments nearly equal, and separated by deep sutures. To include *S. punctatissimus*, p. 50, *denticollis* and *femoralis*, p. 51, New Guinea: spp. nn.

Panophysis, Reitter, *l. c.* p. 185. Differs from *Batrisus* by the distinctly three-jointed club of the antennæ, and the approximating hind tarsi. Type, *P. koppi*, sp. n., *l. c.* pl. ix. fig. 4, West Africa.

Xybaris, id. *l. c.* p. 140. Allied to *Eupines*, King (= *Rybaxis*, Reitt.); elytra with four fine depressions at the base; thorax with one on each side at base; abdomen narrow, not convex. Types, *X. spiniceps*, pl. v. fig. 11, San Paulo, Brazil, and *troglocera*, Colombia, spp. nn., *l. c.* pp. 142 & 144.

Batrybraxis, id. *l. c.* p. 141. Intermediate between *Batrisus* and *Bythinus*; palpi as in the latter, but last joint much smaller; abdomen with only the first segment margined. Types, *B. fortis*, pl. v. fig. 5, and *curtula*, spp. nn., *l. c.* pp. 145 & 146, San Paulo.

Sunorfa, Raffray, *l. c.* p. 28. Allied to *Bythinus*; antennæ ten-jointed; prothorax transverse. Type, *S. capitata*, sp. n., *l. c.*, New Guinea.

Borneana, Schaufuss, Bull. Soc. Ent. Fr. (6) ii. p. cxl. Shape of

Bryaxis; body and elytra shining; head and thorax opaque, deeply foveate-punctate; thorax with three longitudinal sulci, two lateral, the third median, and terminating before and behind in a foveola. Type, *B. biformis*, sp. n., *l. c.* p. cxli., Borneo.

Gastrobothrus, Broun, N. Z. J. Sci. i. p. 287. Allied to *Bryaxis*; antennal tubercles separate; a large fovea near each eye. Type, *B. abdominalis*, Broun.

Acamaldes, Reitter, *l. c.* p. 140. Allied to *Bryaxis*; thorax with transverse basal furrows, no central furrow; abdomen with a basal furrow between the dorsal striæ. Type, *A. bythinoides*, sp. n., *l. c.* p. 191, pl. ix. fig. 8, West Africa.

Trimiopsis, Reitter, *l. c.* p. 149. Differs from *Trimium* as follows:—dorsal segments of equal length; second and third ventral segments lengthened; terminal joint of palpi slightly securiform. Type, *T. clavicepe*, sp. n., *l. c.* p. 150, pl. v. fig. 9, Colombia.

Commatocerus, Raffray, *l. c.* p. 1. Allied to *Fustiger*, but antennæ three-jointed, though the first joint cannot be seen from above. Type, *C. elegantulus*, sp. n., *l. c.* pl. i. figs. 1–3, Abyssinia.

Clavigeropsis, id. *l. c.* p. 3. Reitter, Ins. Deutschl. *Col.* iii. p. 3. Allied to *Clavigerodes*, but antennæ five-jointed, the first two joints minute, the last truncated, mandibles strong. Type, *C. formicarius*, sp. n., *l. c.* p. 4, pl. i. fig. 5, Bogos.

Espeson, Schaufuss, Ann. Soc. Ent. Fr. (6) ii. p. 45. An aberrant form of *Pselaphida*, with three-jointed tarsi. Type, *E. moratus*, sp. n., *l. c.*, St. Thomas. (*Cf.* also Ann. Mus. Genov. xviii. p. 168, figs. *a* & *b*.)

Centrotoma ludii, Reitter, Ins. Deutschl. *Col.* iii. p. 20, Tyrol.

Desimia subcalca, id. Deutsche E. Z. xxvi. p. 180, pl. viii. fig. 6, West Africa.

Tetracis (?) *ventralis*, Raffray, Rev. d'Ent. i. p. 8, pl. i. fig. 8, Bogos.

Pselaphodes (?) *foveolatus*, Singapore, pl. i. fig. 13, and *P.* (?) *heterocerus*, Java, pl. ii. figs. 14–16, *id. l. c.* pp. 14 & 15.

Zethus westwoodi, Schaufuss, Bull. Soc. Ent. Fr. (6) ii. p. cxiii., Burma (?); *Z. batavianus*, id. Tijdschr. Ent. xxv. p. 67, Notes Leyd. Mus. iv. p. 147, Batavia.

Enoptostomus javanus, id. *ll. cc.* pp. 73 & 153, Java.

Ctenistes mitis, id. *ll. cc.* pp. 74 & 154, Batavia; *C. deserticola* and *curvidens*, pls. i. fig. 9, & ii. fig. 10, Raffray, *l. c.* p. 10, Abyssinia; *C. imitator*, and *C.* (*Sogaorus*) *simonis*, pl. viii. fig. 2, Reitter, *l. c.* p. 179, West Africa.

Tmesiphorus umbrosus, Java, p. 10, *papuanus*, New Guinea, *armatus*, Singapore, p. 11, *denticornis*, pls. i. fig. 11, & ii. fig. 12, Bogos, p. 12, and *pubescens*, Java, p. 13, Raffray, *l. c.*

Tyrus elevatus, New Guinea, and *javanicus*, Java, *id. l. c.* pp. 29 & 30.

Hamotus gracilicornis, Colombia, *monachus* (Saulcy, MS.), Yucatan, p. 131, *clavicornis*, Venezuela, *tritomus*, Colombia, p. 132, *singularis*, Mexico, p. 133, note, Reitter, Deutsche E. Z. xxvi.

Curculionellus nitidus, Schaufuss, Ann. Soc. Ent. Fr. (6) ii. p. 44, New Guinea.

Odontalgus raffrayi, Reitter, *l. c.* p. 177, pl. viii. fig. 3, West Africa.

Pselaphus filipalpis, id. *l. c.* p. 187, West Africa; *P. delicatulus*, Raffray, *l. c.* p. 14, Abyssinia.

Trichonyx plicatulus, Schaufuss, Rev. d'Ent. i. p. 185, Cayenne; *T. torquatus*, id. Ann. Soc. Ent. Fr. (6) ii. p. 45, Surinam; *P. filiformis*, Raffray, *l. c.* p. 79, Java.

Batrisus foveicollis, *hydropicus*, p. 56, *giganteus*, Bogos, *papuanus*, p. 57, *simplex*, New Guinea, p. 58, *æthiopicus*, Bogos, *testaceus*, p. 59, *punctatissimus*, New Guinea, p. 60, *moluccarum*, Moluccas, *exiguus*, p. 61, *pubescens*, p. 62, *javanicus* and *bicolor*, p. 63, *longipennis*, p. 64, *capitatus*, p. 73, *angusticollis*, Java, *pallidus*, New Guinea, p. 74, *peruvianus*, Peru, *spinicollis*, Bogos, p. 75, *tricuspidatus*, New Guinea, p. 76, and *caudatus*, Abyssinia, p. 77, *id.* l. c.; *B. ritsemæ*, Sumatra, *fumebraccatus*, Batavia, and *sculpturatus*, East Java, Schaufuss, Notes Leyd. Mus. iv. pp. 150–152 (*cf.* also Tijdschr. Ent. xxv. pp. 70 & 71); *B. deformis*, Reitter, Deutsche E. Z. xxvi. p. 184, pl. viii. fig. 1, West Africa; *B.* (*Syrbatus*) *clypeatus*, fig. 6, p. 134, *B.* (*S.*) *phantasma*, fig. 7, *B.* (*S.*) *sublyratus*, p. 135, *B.* (*S.*) *simplicifrons*, *B.* (*S.*) *calcarifer*, p. 136, *B.* (*S.*) *brevispinus*, fig. 8, pl. v., San Paulo, Brazil, *B.* (*Arthmius*) *tripunctatus*, p. 137, *B.* (*A.*) *luzeræ*, Colombia, p. 138, and *B.* (*A.*) *bicolor*, San Paulo, p. 139, *id. l. c.*

Rhexius procerus, fig. 2, p. 146, *simonis*, fig. 3, San Paulo, Brazil, p. 148, and *rugulosus*, Colombia, p. 149, *id. l. c.* pl. v.; *R. angustatus*, Cayenne, and *semihyalinus*, New Granada, Schaufuss, Bull. Soc. Ent. Fr. (6) ii. p. xciii.

Bryaxis monoceros, id. *l. c.* p. xciv., Surinam; *B. aurivillii*, id. Ann. Soc. Ent. Fr. (6) ii. p. 44, Surinam; *B. nasuta*, Magdalena, p. 142, *biclavata*, pl. v. fig. 10, Bogota, p. 143, *rosmarus*, fig. 5, p. 187, *picticornis*, fig. 6, p. 188, *schlerethi* and *pulvinata*, fig. 7, pl. ix., West Africa, p. 189, Reitter, l. c.; *B. circumflexa*, p. 32, *foveiventris*, Bogos, p. 33, *villosula* and *papuana*, New Guinea, p. 34, *pulla*, Abyssinia, *moluccana*, Moluccas, p. 35, *nitidissima*, Java, p. 86, *lucida* and *longipennis*, New Guinea, p. 37, Raffray, *l. c.*

Eupines rudicorne[*-nis*], Broun, N. Z. J. Sci. i. p. 288, New Zealand.

Centrophthalmus rubens, p. 25, *grandipalpis*, p. 26, *exilis*, and *monilis*, p. 27, *id. l. c.*, Bogos; *C. grandis*, p. 181, *dominus*, fig. 5, and *barbatus*, fig. 4, p. 183, Reitter, *l. c.* pl. viii., West Africa.

Decarthron bipunctatum, id. *l. c.* p. 142, Colombia.

Cyathiger sylvestris, Raffray, *l. c.* p. 4, New Guinea.

Bythinus inflatipes, Frankfort-on-Maine, and *germanus*, Germany, Reitter, Ins. Deutschl. *Col.* iii. pp. 72 & 84; *B. atomus*, Schaufuss, Tijdschr. Ent. xxv. p. 65, and Notes Leyd. Mus. iv. p. 145, Batavia.

Euplectus fauveli, Macassar, p. 79, *major*, p. 80, *armipes*, New Guinea, *cordicollis*, Zanzibar, p. 81, *elegantulus* and *femoratus*, New Guinea, p. 82, *antennatus*, p. 83, *clavatus*, Abyssinia, and *crassus*, New Guinea, p. 84, Raffray, *l. c.*; *E. rhenanus*, Durkheim, and *tenuicornis*, Silesia, Hungary, Reitter, *l. c.* pp. 114 & 115; *E. strix*, pl. ix. fig. 1, and *biformis*, id. Deutsche E. Z. xxvi. p. 192, West Africa; *E. acuminatus*, Schaufuss, Tijdschr. Ent. xxv. p. 69, and Notes Leyd. Mus. iv. p. 149, Batavia; *E. tuberigerus* [*-ger*], Broun, N. Z. J. Sci. i. p. 289, New Zealand.

Panaphantus squamiceps, Schaufuss, *ll. cc.* pp. 66 & 146, Batavia.

Paussidæ.

Notes on several Australian *Paussidæ*; Dohrn, S. E. Z. xliii. pp. 254–256.

Paussus howa, Dohrn, noticed; *id. l. c.* pp. 370 & 371.

Paussus centurio, sp. n., *id. l. c.* p. 106, Tanganyika.

Scydmænidæ.

(See also *Pselaphidæ*.)

Reitter, E. I Scydmænidi d'Abissinia. Nat. Sicil. i. pp. 241–247 & 269–274.

Reitter, Ins. Deutschl. iii. pp. 140–198, divides the *Scydmanidæ* into the following sections:—*Chevrolatini*, *Cephennini*, *Scydmænini*, *Eumicrini*, and *Mastigini*.

Scydmænus nietneri, *brunnipennis*, and *latipennis*, Motsch., = *glandulifer*us, *pyriformis*, and *angusticeps*, Nietn., *abyssinicus*, Reitt., = *pinguiculus*, Gerst.; *alatus*, *femoralis*, *pselaphoides*, and *intermedius*, Nietn., belong to *Eumicrus*; *E. crassicornis*, Motsch., = *S. ceylanicus*, Nietn.; *S. ocatus*, Nietn. (= *breviusculum*, Motsch.), is a *Cephennium*; Schaufuss, Nunq. Ot. iii. p. 560. *S. pyriformis*, Nietn. (= *brunnipennis*, Motsch.), redescribed; *id.* Tijdschr. Ent. xxv. p. 75, and Notes Leyd. Mus. iv. p. 156. *S. pilipennis*, Motsch., belongs to *Eumicrus*; Reitter, Wien. ent. Z. i. p. 199. *S.* (*Euconnus*) *gredleri*, Reitt. (*nec* Saulcy), noticed; Gredler, Z. Ferd. (3) xxvi. p. 221.

Neuraphes longicollis, Muls., = *mulsanti*, Reitt., = *myrmecophilus*, Aubé; Reitter, *l. c.* p. 167.

Pseudomicrus, Motsch., = *Eumicrus*, Cast.; *id. l. c.* p. 168.

Eumicrus brevicornis, Schauf., belongs to *Euconnus*, subgenus *Napochus*, Thoms.; *id. l. c.* p. 168. *E. abyssinicus*, Reitt., is distinct from *Scydmænus pinguiculus*, Gerst.; *id. l. c.* p. 169. *E. raffrayi*, Reitter, ♂ noticed; *id.* Nat. Sicil. i. p. 272.

Mastiger, Motsch., = *Articerus*, Dalm., and *Claviger hageni*, Motsch., is an *Articerus*; id. Wien. ent. Z. i. p. 68.

Neuraphomorphus, g. n., Reitter, Nat. Sicil. i. p. 242. Allied to *Chevrolatia*, maxillary palpi with two joints contiguous and oval, the last short, conical, indistinct, front smooth; type, *N. adustus*, sp. n., *l. c.*, Abyssinia.

New species:—

Chevrolatia breviceps, Reitter, Nat. Sicil. i. p. 242, Abyssinia.

Scydmænus (*Stenichus*) *perpusillus*, id. *l. c.* p. 243, Abyssinia.

Euconnus quinque-punctatus, *quinque-impressus*, p. 244, *imaguncula*, *imitamentus*, p. 245, *stuporis*, *impressicollis*, p. 246, *samharæus*, *æthiops*, p. 247, *pullatus*, and *imparatus*, p. 269, *id. l. c.*, Abyssinia; *E. fimbriatus*, p. 151, *conicus*, San Paulo, Brazil, p. 152; *E. auro-sericeus*, fig. 2, p. 193, *subdivisus*, fig 3, pl. ix. *atricapillus*, p. 194, and *intrusulus*, p. 195, *id.* Deutsche E. Z. xxvi., West Africa.

Neuraphes emonæ, Laibach, p. 166, *parilis*, S. Spain, and *profanus*, p. 171, Dalmatia and Herzegovina, Reitter, Ins. Deutschl. *Col.* iii.

Hylotorus blanchardi, Raffray, Bull. Soc. Ent. Fr. (6) ii. p. xlviii, Abyssinia.

Eumicrus gemelus, *astutus*, *bogosensis*, p. 271, *achilleus*, *schaufussi*, p. 272, *tetrameloides*, *E.* (*Eustemmus*) *pareiceps*, *E.* (*E.*) *endesoides*, p. 273, and *E.* (*E.*) *larvatis*, p. 274, Reitter, Nat. Sicil. i., Abyssinia; *E. epopsimus*, Schaufuss, Tijdschr. Ent. xxv. p. 74, and Notes Leyd. Mus. iv. p. 155, Batavia.

Silphidæ.

Fletcher publishes a general article on American *Necrophori*, and figures *Necrophorus velutinus*, Fabr.; Rep. E. Soc. Ont. 1881, pp. 70–73, fig. 41.

Leptinus, Müll., *Leptinillus*, Horn, and *Platypsylla*, Rits. Generic characters discussed, and details of *Leptinillus validus*, Horn (figs. 1–6), and of *P. castoris*, Rits. (figs. 7–12), figured; Horn, Tr. Am. Ent. Soc. x. pp. 113–115, pl. v.

Necrophorus interruptus, varr. *brunnipes* and *trimaculatus* described; Gradl, Ent. Nachr. viii. p. 331.

Silpha granulata, Oliv. Monstrous specimen noticed; Ragusa, Nat. Sicil. i. p. 281, pl. xi. fig. 7.

Necrophilus prolongatus, Sharp, redescribed; Broun, N. Z. J. Sci. i. p. 290.

Pteroloma forstræmi noticed; Aurivillius, Ent. Tidskr. iii. pp. 196 & 215.

Bathyscia. Species found in the Maritime Alps described: (*B. ovoidea* and *epuræoides*, Fairm., *aubei*, Kies., and 2 new species); Abeille de Perrin, Rev. d'Ent. i. pp. 17–19. *B. erberi*, Schauf., = *celata*, Hampe; Reitter, Wien. ent. Z. i. p. 68.

Leptinillus, g. n., Horn, Tr. Am. Ent. Soc. x. p. ii. Allied to *Leptinus*, eyes rudimentary, and anterior coxæ separated by the prosternum; type, *L. validus*, Horn.

New species:—

Choleva lugubris, Sharp, Tr. E. Soc. 1882, p. 78, New Zealand.

Colon rufipes (Czwalina, MS.), Von Heyden, Deutsche E. Z. xxvi. p. 45, Andalusia.

Triarthron cedonulli, Schaufuss, Ann. Soc. Ent. Fr. (6) ii. p. 43, California.

Silphites priscus, Fritsch, Beitr. Pal. Oesterr.-Ung. ii. p. 4, pl. ii. fig. 1, fossil, Bohemia.

Bathyscia grouvellii and *brevicollis*, Abeille de Perrin, Rev. d'Ent. i. pp. 17 & 19, Alpes Maritimes.

Clambus domesticus and *suffusus*, Broun, N. Z. J. Sci. i. p. 291, New Zealand.

Trichopterygidæ.

Ptinella denticollis, Fairm., noticed; Blatch, Ent. M. M. xviii. pp. 276 & 277.

Actidium coarctatum found in a hot-bed ; Fowler, *op. cit.* xix. p. 139.

Ptiliodes, g. n., Matthews, Cist. Ent. iii. p. 40. Distinguished from *Ptinella* by its oblong, depressed form, quadrate thorax, and different structure of antennæ. Type, *P. blackburni*, sp. n., *l. c.* p. 41, pl. ii. fig. 3, Honolulu.

Ptenidium cæcum, sp. n., Joseph, B. E. Z. xxvi. p. 46, Carniola (*cf.* Reitter, Wien. ent. Z. i. p. 167).

Ptinella anophthalma, Joseph, *l. c.* Carniola (? = *aptera*, Reitter, *l. c.*) ; *P. fauveli*, Matthews, Rev. d'Ent. i. p. 184, New Zealand; *P. pacifica*, id. Cist. Ent. iii. p. 42, pl. ii. fig. 4, Honolulu : spp. nn.

Actidium sharpianum, id. *l. c.* p. 39, pl. ii. fig. 2, Honolulu.

Histeridæ.

Broun, T. Remarks on the *Histeridæ* of New Zealand. N. Z. J. Sci. i. pp. 150–153.

General notes on localities, &c.

Saprinus pedator noticed ; Chalmer, N. Z. J. Sci. i. p. 213.

Acritus balearicus, Schauf., = *minutus*, Herbst, and *A. nigricornis*, Thoms. (*nec* Hofm.) = *fulvus*, Mars. ; Reitter, Wien. ent. Z. i. pp. 168 & 199.

Peploglyptus belfragii, Lec., noticed and figured ; Horn, Tr. Am. Ent. Soc. x. p. 117, pl. vi. figs. 1 & 2.

Hister pachysomus and *mtesa*, Ancey, Le Nat. ii. pp. 55 & 71, Usagara ; *H. ritsemæ*, Marseul, Notes Leyd. Mus. iv. p. 125, Siberia : spp. nn.

Acritus balearicus, sp. n., Schaufuss, Nunq. Ot. iii. p. 529, Balearic Islands.

Syntheliidæ.

Syntheliidæ, fam. nov., Lewis, Ent. M. M. xix. p. 137. Differs from *Histeridæ* by the proximity of the anterior coxæ, and the prominent mesosternum. To include *Syntelia* and *Sphærites*.

Syntelia histeroides, sp. n., id. *l. c.* p. 138, Japan.

Nitidulidæ.

Cercus, Latr., table of French species ; Des Gozis, Rev. d'Ent. i. p. 196. *C. metallescens*, Schauf., = *Brachypterus pallipes*, Murr. ; Reitter, Wien. ent. Z. i. p. 168.

Carpophilus hemipterus, Linn., and varr. *genuinus* and *pictus*, Heer, noticed ; Letzner, JB. schles. Ges. lix. pp. 345–347. *C. bipustulatus*, Heer, and *4-signatus*, Erichs., discussed ; Reitter, *l. c.* pp. 189 & 190. *C. quadripustulatus*, Er., = *bipustulatus*, Heer ; Schaufuss, Nunq. Ot. iii. p. 560.

Meligethes spinipes, Reitt., = *marrubii*, Bris. ; *M. parvulus*, Bris. (= *niger*, Bris.) is distinct from *memnonius*, Er. : Brisout, Bull. Soc. Ent. Fr. (6) ii. p. xxix. *M. spinipes*, Reitt., = *marrubii*, Bris., = *nanus*, Erichs. ; *M. memnonius*, Reitt. (*nec* Erichs.) = *parvulus*, Bris. : Reitter, *l. c.* p. 199.

Cybocephalus. The species probably feed on *Coccidæ*; Riley, Am. Nat. xvi. p. 514.

Cyclomorpha and *Priateles*, Broun (pre-occupied), respectively renamed by him *Melanochroa* and *Priatelus* (or *Priates*); N. Z. J. Sci. i. p. 128, Ann. N. H. (5) ix. p. 409.

Gaurambe, g. n., Reitter, Verh. Ver. Brünn, xx. p. 148. Subgenus of *Ostoma*; none of the tibiæ furrowed, elytra with rows of punctures, the spaces between the rows generally slightly raised. To include *O. ferrugineum*, Linn., &c.

Stylulus, g. n., Schaufuss, Ann. Soc. Ent. Fr. (6) ii. p. 46. Allied to *Rhizophagus*, head narrower, mandibles acuminate. Type, *S. nasutus*, sp. n., *l. c.*, St. Thomas.

Cercus inglorius, sp. n., Des Gozis, Rev. d'Ent. i. p. 196, Chambéry.

Ostoma giganteum, sp. n., Reitter, Verh. Ver. Brünn, xx. p. 148, Siberia, Amur.

Meligethes buyssoni, sp. n., Brisout, Bull. Soc. Ent. Fr. (6) ii. p. xxix. Auvergne.

Trogositidæ.

Melambia cæruleata, sp. n., Fairmaire, Révoil's Faune et Flore Somal. *Col.* p. 11, Somali-land.

Grynoma regularis, sp. n., Sharp, Tr. E. Soc. 1882, p. 78, New Zealand.

Colydiidæ.

Helioctamenus, Schauf., is allied to *Cozelus* and *Tarphius*; Reitter, Wien. ent. Z. i. p. 168.

Distaphyla, Pasc., = *Colydodes*, Motsch.; Reitter, *l. c.* p. 68.

Pleganophorus bispinosus, Hampe. Structure described; it belongs to the *Mycetæidæ*, near *Trochoides*, Westw., and *Leiestes*, Redt.: *id. l. c.* pp. 255–257.

Aglenus brunneus, var. *rugipennis*, from Greece, described; Schaufuss, Ann. Soc. Ent. Fr. (6) ii. p. 48.

New genera and species:—

Diplagia, Reitter, Verh. Ver. Brünn, xx. p. 117. Shape and sculpture of *Orthocerus*; antennæ of *Corticus*; eyes large, transverse, with scale-like hair. Type, *D. hellenica*, sp. n., *l. c.* p. 118, Greece.

Dryptops, Broun, N. Z. J. Sci. i. p. 292. Allied to *Tarphiomimus* and *Ulonotus*; facies of the former, but differing in the less developed basal articulation of the tarsi. To include *T. acuminatus*, Broun, and *D. dorsalis* and *undosus*, spp. nn., *l. c.* pp. 292 & 293, New Zealand.

Recyntus, id. *l. c.* p. 293. Allied to *Syncalus*, but having the intermediate and hind legs more approximated. Type, *R. exiguus*, sp. n., *l. c.* p. 294, New Zealand; add *Ulonotus tuberculatus*, *insignis*, and *salebrosus*, Broun.

Paramellon, Waterhouse, P. E. Soc. 1882, p. iv. Allied to *Cossyphodes*; antennæ 10-jointed, the club consisting of a single large joint. Type, *P. sociale*, sp. n., *l. c.* Bombay.

Helioctamenus, Schaufuss, Nunq. Ot. iii. p. 531. Allied to *Lado*; antennæ 10-jointed, club formed of one joint only, sides of thorax less acutely angulated. Type, *H. hippopotamus*, sp. n., *l. c.*, Balearic Islands.

Namunaria, Reitter, *l. c.* p. 114. Allied to *Colobicus*; to include the North American species referred by Horn to *Coxelus*.

Niphopelta, id. *l. c.* p. 129. Allied to *Colobicus*, antennæ with third joint but little longer than fourth, abdominal segments separated by deep incisions; thorax laterally indented, not rounded, body long, cylindrical. Type, *N. imperialis*, sp. n., *l. c.*, Caspian Sea.

Munaria, id. Notes Leyd. Mus. iv. p. 55. Differs from *Mecedanops*, Reitt., by its short tarsal joints, contiguous anterior coxæ and ribbed thorax. Type, *M. ritsemæ*, sp. n., *l. c.* p. 56, Sumatra.

Cryptozoon, Schaufuss, Ann. Soc. Ent. Fr. (6) ii. p. 47. Form of *Aglenus brunneus*, but less convex and shining, thorax more quadrate, four last joints of antennæ claviform, serrated on both sides. Types, *C. civile* and *nitidicolle*, spp. nn., *l. c.*, Porto Rico.

Corticus brevipennis, Reitter, Verh. Ver. Brünn, xx. p. 119, Caucasus.

Ablabus brevis, Broun, N. Z. J. Sci. i. p. 292, New Zealand.

Coxelus clarus, id. *l. c.* p. 294, New Zealand.

Diloma separanda, Reitter, *l. c.* p. 126, Bohemia, Lower Austria, Siebenbürgen.

Synchitodes rufa, id. *l. c.* p. 131, Egypt.

Colobicus ampliatus, Fairmaire, Le Nat. ii. p. 68, Abyssinia.

Gempylodes superans, Pascoe, Ann. N. H. (5) ix. p. 26, and Waterhouse, Aid, ii. p. ci., Siam.

Aglenus major, Schaufuss, Ann. Soc. Ent. Fr. (6) ii. p. 48, Andalusia.

Pycnomerus rufescens and *basalis*, Broun, *l. c.* p. 295, New Zealand.

Cerylon magnicolle, Caucasus, and *conicicolle*, Lenkoran, Reitter, *l. c.* pp. 137 & 138.

Tarphiomimus wollastoni, Sharp, Tr. E. Soc. 1882, p. 79, New Zealand.

Acosmetus reitteri, id. *l. c.* p. 80, New Zealand.

Cucujidæ.

Catogenus rufus. Larva devouring a pupa of *Elaphidion parallelum* (pupa of *C. rufus*, figured); G. Dimmock, Psyche, iii. pp. 341 & 342.

Chætosoma scaritides, Westw., redescribed; Broun, N. Z. J. Sci. i. p. 296.

Dryocora howitti, Pascoe, figured by Waterhouse, Aid, ii. p. cii.

Cucujus hæmatodes, Erichs., noticed; Costa, Atti Acc. Nap. ix. (6) p. 43.

C. coccinatus, Lewis, = *grouvellii*, Reitt.; Reitter, Wien. ent. Z. i. p. 68.

Brontes humeralis, Fald. ?, = *Hyliota planata*, Linn.; *id. l. c.* p. 67.

Læmophlæus ferrugineus, Steph., larva described; Olliff, Ent. xv. pp. 214 & 215.

Xenoscelis deplanatus, Woll., is quite distinct from *costipennis*, Fairm.; Reitter, *l. c.* p. 170.

Parabrontes setiger, sp. n., Broun, N. Z. J. Sci. i. p. 297, New Zealand.

Cryptophagidæ.

Cryptophagus: notes on various species. *C. lapidarius*, Reitt., = *montanus*, Bris.; *C. gracilis*, Reitt., = *lapidarius*, Fairm.; *C. punctipennis*, Bris., is apparently distinct from *pilosus*, Gyll.; *C. mascariensis*, Reitt., ? = *cellaris*, Scop., var.; *C. umbratus*, Er., ? = *distinguendus*, Sturm, var.: Brisout, Bull. Soc. Ent. Fr. (6) ii. pp. xxvii. & xxviii. *C. gracilis*, Reitt., and allies, noticed; *C. punctipennis*, Bris., discussed; *C. mascariensis*, Reitt., probably = *cellaris*, Scop., var.; *C. umbratus*, Er., seems to be distinct from *distinguendus*, Sturm; Reitter, Wien. ent. Z. i. pp. 197–199.

Paramecosoma balearicum, Schauf., = *Leucohimatium elongatum*, Erichs.; *id. l. c.* p. 67. Schaufuss disputes this; Bull. Soc. Ent. Fr. (6) ii. p. ciii.

Atomaria linearis injurious to mangold; Fryer, Ent. xv. p. 138. *A. berolinensis*, Kraatz, is distinct from *atricapilla*, Steph.; Brisout, *l. c.* p. xxix. *A. degeeri*, Big., = *Epidapus atomarius*, De Geer; Mik, Wien. ent. Z. i. p. 65.

Cryptophagus perrisi, S. France, and *lamellicornis*, Pyrenees, Brisout, Bull. Soc. Ent. Fr. (6) ii. p. xxviii., spp. nn. (*cf.* also Reitter, *l. c.* p. 199, who states that the latter = *reflexicollis*, Reitt.).

Atomaria grandicollis, sp. n., *id. l. c.* (cf. Reitter, *l. c.* p. 199), Chamonix, &c.

Cænoscelis subdeplanata, sp. n., *id. l. c.* p. xxix. (*cf.* Reitter, *l. c.*), Arcachon.

Lathridiidæ.

Notes on various *Lathridiidæ*, Belon, Bull. Soc. Ent. Fr. (6) ii. pp. cxxiii.–cxxv.

Langelandia media, *muelleri*, and *planulata*, Schauf., are only MS. names; Schaufuss, Bull. Soc. Ent. Fr. (6) ii. p. lxxxv.

Anommatus kiesenwetteri, Reitt., is from Dresden, not Andalusia, and = *pusillus*, Reitt., Schauf.; *A. 12-striatus*, Er., is distinct: *id. l. c.* p. clxxxiii.

Lathridius. Species tabulated; the genus *Coninomus*, Belon, is not sufficiently distinct. Belon. CR. Ent. Belg. xxvi. pp. ci. & cii.

Isidus moreli, Rey, noticed; Rey, Ann. Soc. L. Lyon, (2) xxviii. pp. 127 & 128.

Corticaria pilosula, Rosenh., is distinct from *fulva*, Com.; Reitter, Wien. ent. Z. i. p. 168.

Merophysia ovalipennis, Coye, = *orientalis*, Saulcy; *id. l. c.* p. 67.

New genera and species :—

Lastrema, Reitter, Verh. Ver. Brünn, xx. p. 129. Allied to *Lyreus*; eyes present. Type, *Pycnomerus verrucicollis*, Reitt.

Chorasus, Sharp, Tr. E. Soc. 1882, p. 79. Allied to *Langelandia*; type, *C. subcæcus*, sp. n., *l. c.* p. 80, New Zealand.

Monoedus, Horn, Tr. Am. Ent. Soc. x. p. 116. Allied to the *Monotomidæ* (?); type, *M. guttatus*, sp. n., *l. c.* pl. iv. fig. 10, Florida.

Lathridius (*Coninomus*) *setulosus*, Belon, CR. Ent. Belg. xxvi. p. ci., Petropolis.

Corticaria tarsalis, Broun, N. Z. J. Sci. i. p. 297, New Zealand.

Dasycerus carolinensis, North Carolina, and *angulicollis*, California, Horn, Tr. Am. Ent. Soc. x. p. 117, pl. iv. figs. 11 & 12.

Mycetophagidæ.

Symbiotes. Table of species; Schaufuss, Nunq. Ot. iii. p. 545. Discussed: Reitter, Wien. ent. Z. i. pp. 168 & 169.

Propalticus jansoni, sp. n., Sharp, Cist. Ent. iii. p. 32, pl. ii. fig. 1, New Guinea.

Symbiotes minutus, sp. n., Schaufuss, *l. c.* p. 544, Mallorca (= *gibberosus*, Luc.; Reitter, *l. c.* p. 169).

Dermestidæ.

Perimegatoma variegatum, Horn, a museum pest; Bush & Riley, Am. Nat. xvi. p. 826.

Attagenus sordidus, Heer, and *megatoma*, Fabr., identifications discussed; Letzner, JB. schles. Ges. lix. pp. 349 & 350. *A. unifasciatus*, Fairm., = *cinnamomeus*, Roth., = *subfasciatus*, Chevr., = *gloriosus*, Fabr.; Reitter, Wien. ent. Z. i. p. 68. *A. annulifer*, Cast., = *gloriosus*, Fabr.; *id. l. c.* p. 199. *A. megatoma*: curious felting produced by it; Riley & Hales, Am. Nat. xvi. pp. 1018 & 1019.

Trogoderma tarsalet, Mels., noted as injurious to museums, and larva and pupa described; Snow, Psyche, iii. pp. 351 & 352.

Byrrhiidæ.

Reitter, E. Ueber die verschiedenen Forceps-Bildungen der europäischen *Cistela* (*Byrrhus*) Arten. Deutsche E. Z. xxvi. pp. 121 & 122, pl. i.

In *C. gigas*, Fabr., and *sorreziana*, the middle valve is curved upwards; in all the other species (which are divided into six groups, according to variation of structure) it is curved downwards.

Pedilophorus. Table of French species; Des Gozis, Rev. d'Ent. i. pp. 195 & 196.

Nosodendron zealandicum, sp. n., Sharp, Tr. E. Soc. 1882, p. 81, New Zealand.

Morychus gemmeus and *insuetus*, spp. nn., Broun, N. Z. J. Sci. i. p. 298, New Zealand.

Pedilophorus stierlini, sp. n., Des Gozis, *l. c.* p. 193, Basses Alpes.

Georyssidæ.

Georyssus minor, sp. n., Sharp, Biol. Centr. Am. *Col.* i. (2) p. 141, pl. iv. fig. 17, Guatemala.

Cyathoceridæ.

A family of doubtful affinities; it may be placed near the

Georyssidæ ; antennæ four-jointed, last joint very large, truncated at the tip, and pubescent ; tarsi moderately long, rigid, uniarticulate, and terminating in a single claw. To include *Cyathocerus*, g. n., Sharp, *l. c.* p. 142 ; type, *C. horni*, sp. n., *l. c.* p. 144, pl. iv. figs. 18 & 18 *a–c*, Guatemala.

Parnidæ.

Psephenus lecontii, Hald., noticed and figured ; Horn, Tr. Am. Ent. Soc. x. pp. 117 & 118, pl. vi. figs. 14 & 15. Habits ; Gehring, Canad. Ent. xiv. pp. 72 & 73.

Lara amara, Lec., noticed and figured ; Horn, *l. c.* p. 118, pl. vi. fig. 16.

Lureynia latreillii, Bedel (= *ænea*, Er., *nec* Müll., which = *maugeti*, Latr.). Variation discussed ; *L. hirschi*, Müll., is one variety, and *similis*, Müll., is probably another ; Flach, Deutsche E. Z. xxvi. pp. 252 & 253.

Pachycephala, Broun (preoccupied), renamed by him *Udorius*, and afterwards *Hydora* ; N. Z. J. Sci. i. p. 128, Ann. N. H. (5) ix. p. 409.

New genera and species :—

Byrrhomorphus, Sharp, Biol. Centr. Am. *Col.* i. (2) p. 125. Belongs to the *Potamophilini* ; intermediate between the *Parnidæ* and the *Byrrhidæ* ; type, *B. vestitus*, sp. n., *l. c.* p. 126, Panama.

Elmoparnus, id. *l. c.* p. 125. Allied to *Parnus*, but resembles *Elmis* in appearance ; head densely covered with tomentum. Type, *E. brevicornis*, sp. n., *ibid.*, Panama.

Disersus, id. *l. c.* p. 127. Allied to *Potamophilus* ; front and middle coxæ widely separated ; anterior femora long ; impression on the mesosternum broad, definite, and narrow behind. To include *P. goudoti*, Guér., and *D. longipennis*, sp. n., *l. c.* pl. iv. fig. 6, Chiriqui.

Hexanchorus, id. *l. c.* p. 127. Intermediate between *Potamophilus* and *Phanocerus* ; type, *H. gracilipes*, sp. n., *l. c.* p. 128, pl. iv. fig. 7, Mexico.

Phanocerus, id. *l. c.* p. 128. Allied to *Potamophilus* ; last six joints of antennæ formed into a thick oval club. Type, *P. clavicornis*, sp. n., *l. c.* p. 129, pl. iv. fig. 8, Guatemala.

Heterelmis, id. *l. c.* p. 130. Allied to *Elmis* ; types, *H. obscurus*, p. 130, *obesus*, pl. iv. fig. 10, and *simplex*, p. 151, spp. nn., Guatemala.

Elsianus, id. *l. c.* p. 131. Allied to last ; types, *E. robustus*, pl. iv. fig. 11, *striatus*, Guatemala, p. 132, and *graniger*, Costa-Rica, p. 133 ; spp. nn.

Potamophilus antennatus, Dohrn, S. E. Z. xliii. p. 251, Guinea.

Pelonomus palpalis, Sharp, Biol. Centr. Am. *Col.* i. (2) p. 122, Panama.

Parnus pusillus, Guatemala, Nicaragua, Panama, p. 123, *mexicanus*, Mexico, *punctipennis*, Guatemala, Panama, and *detritus*, Chiriqui, p. 124, *id. l. c.*

Dryops puncticollis, Mexico, and *elmoides*, pl. iv. fig. 5, Guatemala, *id. l. c.* p. 121.

Elmis championi, fig. 12, Chiriqui, p. 134, *sculptipennis*, *heterocerus*,

fig. 13, Guatemala, p. 135, *granulosus*, Chiriqui, and var. *minor*, Guatemala, *apicalis*, fig. 14, p. 136, *inæqualis*, *distortus*, Guatemala, p. 137, *neatipes*, fig. 15, *longicollis*, p. 138, *sulcicollis*, fig. 16, *curtulus*, Chiriqui, p. 139, *formosus*, Guatemala, and *bufo*, Chiriqui, p. 140, *id. l. c.* pl. iv.

Cyllœpus optatus, id. *l. c.* p. 129, pl. iv. fig. 9, Guatemala.

Heteroceridæ.

Heterocerus debilis, fig. 3, Guatemala, p. 116, *armatus*, fig. 4, pl. iv., *simplex*, Mexico, p. 117, *mexicanus*, Mexico, Guatemala, p. 118, and *spinifer*, Guatemala, p. 119, *id. l. c.*: spp. nn.

Lucanidæ.

Note on the feeding of stag-beetles; Van Volxem, Gard. Chron. (2) xvi. p. 136.

Lucanus cervus pupates in a cell in the ground; Bernard, Bull. Soc. Z. Fr. vii. p. 249. *L. dama* popularly described and figured; Saunders, Rep. E. Soc. Ont. 1881, p. 26, fig. 9.

Platycerus agassizi, Lec., structure noticed; Leconte, Tr. Am. Ent. Soc. ix. p. xxi.

Œsalus scarabæoides, Panz., noticed; De Buysson, Feuill. Nat. ii. pp. 133 & 134.

Gnaphaloryx tricuspis and *leeuweni*, spp. nn., Ritsema, Notes Leyd. Mus. iv. pp. 163 & 164, Sumatra.

Ceratognathus dispar, sp. n., Sharp, Tr. E. Soc. 1882, p. 82, New Zealand.

Dorcus (*Eurytrachelus*) *primigenius*, sp. n., Deichmüller, Verh. L.-C. Ak. xlii. p. 303, pl. xxi. figs. 1, *a*, *b*, Kutschlin (fossil).

Scarabæidæ.

Lansberge, Van. Énumeration des Scarabæides, rapportés du pays des Somalis (Afrique Équatoriale), par Révoil. CR. Ent. Belg. xxvi. pp. xxi.–xxxi.

32 species (mostly new) and 2 new genera enumerated or described, in advance of the appearance of Révoil's work.

Lidth de Jeude, T. W. Van. Die Spijsverlerungsorganen der Phytophage Lamellicornienlarven. Preisschrift. Utrecht: 1882, 8vo, pp. 52.

Meinert, F. Spirakelpladen hos Scarabæ-Larveine. Vid. Medd. 1881, pp. 289–292.

Oliviera, M. P. de. Études sur les insectes d'Angola qui se trouvent au Muséum National de Lisbonne. Fam. *Scarabæidæ*. J. Sc. Lisb. ix. pp. 40–52.

87 species (none new) are enumerated, including varieties of *Gymnopleurus wahlbergi*, Boh., *Popilia dorsigera*, Newm., *Oxythyrea amabilis*, Schaum, and *Clinteria infuscata*, Gory & Perch. (pp. 41, 44, 45, & 49).

Coprides.

Scarabæus acuticollis, Motsch., is apparently distinct from *pius*, Ill.; Dohrn, S. E. Z. xliii. pp. 372 & 373.

Ateuchus semipunctatus, Fabr. Habits described; Berge, CR. Ent. Belg. xxvi. p. cxlix.

Gymnopleurus lævicollis, Cast., redescribed; Lansberge, Révoil's Faune et Flore Çomal. *Col.* p. 14.

Cephalodesmius laticollis, Pascoe, figured by Waterhouse, Aid, i. pl. xciii.

Heliocopris isidis and *antenor*. Note on cocoons; Denaison & Raffray, Bull. Soc. Ent. Fr. (6) ii. p. lxxiv. The male of the former is stated to fly with balls of wet Nile mud between the horns on its head and thorax to a suitable place for the ♀ to deposit her eggs[!]; Villiers Stuart, Funeral Tent of an Egyptian Queen, pp. 12–14, plate.

Copris laticornis, Boh., belongs to *Catharsius*; Schaufuss, Bull. Soc. Ent. Fr. (6) ii p. clxxiii.

Phanæus columbi, Macl. (= *hastifer*, Germ.), noticed; Dohrn, *l. c.* p. 373.

Pteronyx dimidiatus, Lansb., amended description; *id. l. c.* p. 254.

Oniticellus, Serv. The frontal carinæ and the epistoma vary considerably in different species; Rey, Ann. Soc. L. Lyon (2) xxviii. pp. 133 & 134.

Onthophagus tridens, Fabr., ♂ described; Fairmaire, CR. Ent. Belg xxvi. p. xlvi. *O. maki*, Ill., noticed; Xambeu, Feuill. Nat. ii. p. 45.

New species :—

Scarabæus nitidicollis, Lansberge, CR. Ent. Belg. xxvi. p. xxi.; Révoil's Faune et Flore Çomal. *Col.* p. 12, pl. i. fig. 3, Somali-land.

Gymnopleurus somaliensis, id. *ll. cc.* pp. xxii. & 15, Somali-land.

Anachalcos obscurus, Lansberge, CR. Ent. Belg. xxvi. p. xxii. (redescribed under the name of *Chalconotus obscurus*, id. Révoil's Faune et Flore Çomal., *Col.* p. 15), Somali-land.

Coptorrhina bicolor, Ancey, Nat. Sicil. ii. p. 71, Usagara.

Caccobius medio-niger, id. *l. c.* p. 72, Abyssinia.

Catharsius minutus, Lansberge, *ll. cc.* pp. xxii. & 16, Somali-land.

Onthophagus revoili, pp. xxii. & 17, *æsopus* and *bi-arcuatus*, pp. xxiii. & 18, *id. ll. cc.*, Somali-land; *O. pipitzi*, Ancey, *l. c.* p. 72, Madagascar; *O. laminifrons*, Fairmaire, CR. Ent. Belg. xxvi. p. xlvi., Zanzibar; *O. neguss*, Raffray, Bull. Soc. Ent. Fr. (6) ii. p. lxxi. Abyssinia.

Oniticellus californicus, Horn, Tr. Am. Ent. Soc. x. p. 118, pl. vi. figs. 3 & 4, California.

Aphodiides.

Aphodius (*Heptaulacus*) *syrticola*, sp. n., Fairmaire, Bull. Soc. Ent. Fr. (6) ii. p. clxxvii., Tripoli.

Hybosorides.

Hybosorus nitidus, sp. n., Lansberge, CR. Ent. Belg. xxvi. p. xxiii., Révoil's Faune et Flore Çomal., *Col.* p. 21, Somali-land.

Geotrypides.

A fossil fragment from Kutschina, apparently belonging to the *Geotrypidæ*, noticed and figured; Deichmüller, Verh. L.-C. Ak. xlii. p. 305, pl. xxi. fig. 3.

Geotrypes murrayi, Ball., noticed; Kraatz, Deutsche E. Z. xxvi. p. 102.

Thorectes sardous, Erichs., and *geminatus*, Géné, noticed; Costa, Atti Acc. Nap. ix., No. 11, pp. 31 & 32.

Athyreus fracticollis, sp. n., Fairmaire, Révoil's Faune et Flore Çomal. *Col.* p. 20, Somali-land.

Bolboceras serripes, id. *l. c.* p. 19, Somali-land; *B. tertiarium*, Deichmüller, Verh. L.-C. Ak. xlii. p. 304, pl. xxi. figs. 2, 2*a*, *b*; Kutschlin (fossil): spp. nn.

Lethrus geminatus, p. 311, *superbus*, and *puncticollis*, p. 312, Kraatz, Deutsche E. Z. xxvi., Samarcand: spp. nn.

Glaphyrides.

Amphicoma, Lair. (= *Glaphyrus*, Latr. nec *Dasydera*, Lec.). N. American species tabulated [illegible] Horn, = *arctica*, Lec.; Horn, Tr. Am. [illegible] pp. 1[illegible]

Glaphyrus caucasicus, sp. n., Kraatz, Deutsche E. Z. xxvi. p. 312, note, Samarcand.

Melolonthides.

Kraatz, G. Revision der europaisch-syrischen Arten der Melolonthiden-Gattung *Haplidia*, Hope. Deutsche E. Z. xxvi. pp. 33–42.

18 species described, 11 new.

——. Forceps-Abbildungen von exotischen Melolonthiden nach Präparaten von Metzler in Frankfurt-am-Main von Tieffenbach abgebildet. *L. c.* pp. 123 & 124, pls. ii. & iii.

The forceps of 93 species are illustrated.

——. Ueber einige seltene *Melolontha*-Arten und die männlichen Genitalien dieser Gattung. *L. c.* pp. 243–245.

Contains notes on the organs of 7 species figured by Metzler; conjectures respecting *M. afflicta*, Ball., *aceris*, Fald., and *soror*, Mars., and the descriptions of one new species.

Tieffenbach, H. Forceps-Abbildungen europäischen Melolonthiden nach Präparaten von Metzler in Frankfurt-am-Main. *Op. cit.* p. 242, pl. iv.

Serica luteipes, Fairm., = *Triodonta alni*, Blanch.; Von Heyden, Bull. Soc. Ent. Fr. (6) ii. p. xxxi.

Hymenoplia sicula, Blanch., noticed; Ragusa, Nat. Sicil. i. pp. 229 & 250.

Enaria, Er. Structure of antennæ and tibiæ discussed; Waterhouse, Tr. E. Soc. 1882, pp. 493 & 494, note.

Lepidiota. Several species included under *Tricholepis* in Gemminger & Von Harold's Catalogue, are *Melolonthidæ*, and may be removed to

Lepidiota ; *Tricholepis* should be transferred to the *Rhizotroginæ* : id. *l. c.* p. 499.

Lachnosterna fusca : larvæ destroyed by moles ; Claypole, Canad. Ent. xiv. pp. 17 & 18. *L. obesa*, Lec., = *crassina*, Bl. ; *farcta*, Lec., is distinct. Horn, Nunq. Ot. iii. p. 560.

Polyphylla. Kraatz discusses the Palæarctic species, of which he admits 7, including 1 new ; Deutsche E. Z. xxvi. pp. 234–241. *P. adspersa*, Möschl., noticed ; Dohrn, S. E. Z. xliii. p. 107.

Melolontha. European species discussed by G. Metzler, who regards *M. albida*, Friv. (= *candicans*, Burm.), and *pectoralis*, Germ. (= *aceris*, Fald.), of which last *rhenana*, Bach (= *albida*, Er.) is a variety, as perfectly distinct from *M. vulgaris*, Fabr. ; Deutsche E. Z. xxvi. pp. 229–234. On preparing oil and soap from the beetles ; Wiener landwürthschaftliche Zeitung, quoted in Psyche, iii. p. 360. *M. vulgaris* : periodical appearance ; De Borre & Selys-Longchamps, CR. Ent. Belg. xxvi. pp. cxii. & cxiii. A specimen with two extra tibiæ growing from the left hind femur ; Treuge, Ent. Nachr. viii. p. 177. Larva barking young pines ; Ormerod, P. E. Soc. 1882, p. xii.

Elaphocera. Kraatz publishes a revision of this genus, and raises the number of known species to 32 ; *l. c.* pp. 17–32.

Pachypus. Ragusa gives the synonymy of the 2 Sicilian species as follows :—*P. cæsus*, Erichs. (= *siculus*, Lap., = *impressus*, Er.), and *P. cognatus*, Oliv. (= *candidus*, Muls., = *excaratus*, Fabr. & Feisth.) ; *l. c.* pp. 229–231.

New genera and species :—

Sericospilus, Sharp, Tr. E. Soc. 1882, p. 83. Allied to *Odontria* ; type, *O. advena*, sp. n., *l. c.* p. 84, New Zealand.

Eutrichesis, Waterhouse, Tr. E. Soc. 1882, p. 499. Allied to *Schizonycha* ; to include *E. punctatus*, p. 500, *pilosicollis* and *placidus*, p. 501, spp. nn., *l. c.*, Madagascar.

Cryphœobius, Kraatz, Deutsche E. Z. xxvi. p. 313. Placed between *Ancylonycha* and *Polyphylla* ; club of antennæ short, trifoliate ; sides of thorax strongly angulated. Type, *C. brunneus*, sp. n., *l. c.*, Samarcand.

Hoplia misella, Schaufuss, Nunq. Ot. iii. p. 553, Andalusia, Portugal.

Serica bombycina, Karsch, B. E. Z. xxvi. p. 387, Colombo.

Trochalus margaritaceus, Lansberge, Révoil's Faune et Flore Çomal. *Col.* p. 22, Somali-land.

Apogonia planifrons, Borneo, *insulana*, Isle de Prince, *calva*, Celebes, *comosa*, Ceylon, p. 122, *squamipennis*, Persia, *nasalis*, Hedebat, Dar Sennaar, *arta*, New Guinea, *lurida*, *æquabilis*, *anfracta*, Ceylon, *munda*, Siam, and *cava*, Ceylon, p. 123, Karsch, l. c. ; *A. ritsemæ*, Sharp, Notes Leyd. Mus. iv. p. 159, Java.

Encya calva, p. 495, *pyriformis*, *gutticollis*, p. 496, *invulnerata*, p. 497, *variegata*, p. 498, and *cribrata*, p. 499, Waterhouse, Tr. E. Soc. 1882 (*cf.* also p. 493), Madagascar.

Enaria latifrons, *marginata*, p. 494, and *depressiuscula*, p. 495, *id. l. c.*, Madagascar.

Pegylis maculipennis, Lansberge. CR. Ent. Belg. xxvi. p. xxiv.; Révoil's Faune et Flore Çomal. *Col.* p. 23, Somali-land.

Lepidiota suspicax, Dohrn, S. E. Z. xliii. p. 463, Nias; *L. pygidialis*, Waterhouse, *l. c.* pp. 493 & 502, Madagascar.

Haplidia etrusca, Etruria, p. 34, *græca*, Greece, p. 35, *turcica* and *vage-punctata* (Von Heyden, MS.), Turkey, p. 36, *tarsensis*, Tarsus, p. 37, *baudii*, Cyprus, *chaifensis*, p. 38, *villosicollis*, Syria, p. 39, *pubiventris*, Anatolia, *ægyptiaca*, Egypt, and *nitidula*, Syria, p. 40, Kraatz, Deutsche E. Z. xxvi.

Rhizotrogus capito, Fairmaire, Bull. Soc. Ent. Fr. (6) ii. p. clxxviii., Tunis.

Polyphylla ragusæ, Kraatz, *l. c.* p. 239, Nat. Sicil. i. p. 82, Sicily.

Melolontha tibialis, id. Deutsche E. Z. xxvi. p. 245, Persia.

Prochelina rubella, Schaufuss, *l. c.* p. 552, Australia.

Elaphocera heydeni, S. Spain, p. 21, *hirticollis*, *angusta*, Andalusia, p. 23, *græca*, Attica, &c., p. 27, *raymondi*, Salonica, p. 28, *syriaca*, Syria, *erberi*, Isle of Tinos, p. 29, *confusa* (= *suturalis*, ♀, Schauf.), and *lucidicollis*, Rhodes, p. 30, Kraatz, l. c.; *E. capdeboui*, Schaufuss, *l. c.* p. 533, Balearic Islands.

Clitopa opaca, Schaufuss, *ibid.*, Caffraria.

Euchirides.

Euchirus dupontianus, Burm., very large specimen noticed; Lucas, Bull. Soc. Ent. Fr. (6) ii. p. cx.

Rutelides.

Anisoplia austriaca. Ravages in South Russia; Troudy Ent. Ross. xvii. pp. xvi.–xviii. (in Russian) xxv.–xxxii. & xli., Gard. Chron. (2) xii. pp. 178 & 179.

Anomala. Table and descriptions of 14 European species; Ganglbauer, Wien. ent. Z. i. pp. 174–176, 241–249 (details).

Polymœchus, Lec., recharacterized, and details of *P. brevipes*, Lec., figured; Horn, Tr. Am. Ent. Soc. x. pp. 121 & 122, pl. vi. figs. 5–12. It appears to belong to the *Rutelini*.

New species:—

Anomala similis, Lansberge, CR. Ent. Belg. xxvi. p. xxiv., Révoil's Faune et Flore Çomal. *Col.* p. 24, Somali-land; *A. sicula*, Sicily, and *affinis*, Smyrna, Ganglbauer, Wien. ent. Z. i. pp. 175 & 245.

Rhinoplia discors, Karsch, B. E. Z. xxvi. p. 387, Colombo.

Plusiotis lecontii, Horn, Tr. Am. Ent. Soc. x. p. 120, Arizona, New Mexico.

Adoretus phthisicus, Dohrn, S. E. Z. xliii. p. 108, Ferghana; *A. granulifrons*, Fairmaire, Ann. Soc. Ent. Fr. (6) ii. p. 68, Soudan; *A. serie-granatus*, CR. Ent. Belg. xxvi. p. xlvii., Zanzibar.

Dynastides.

Aphonus, Lec., is a Dynastid having a superficial resemblance to *Poly-*

macchus ; Horn, Tr. Am. Ent. Soc. x. p. 112. Mouth-parts of *A. tridentatus* figured, pl. iv. fig. 13.

Pentodon, Hoppe. Species of the European and Mediterranean fauna discussed ; Kraatz, Deutsche E. Z. xxvi. pp. 57–64. A Sicilian species noticed and figured; Ragusa, Nat. Sicil. i. pp. 279 & 280, pl. xi. fig. 5. *P. punctatus*, Vill.: larva compared with that of *Oryctes* ; Piccioli, Bull. Ent. Ital. xiv. pp. 142–147.

Oryctes grypus, Ill.: specimens with an additional horn ; Ragusa, Nat. Sicil. i. p. 280 (*cf.* also Riggio, *op. cit.* ii. pp. 16 & 17). *O. nasicornis* dug up fully developed in February ; Ent. Nachr. viii. p. 54.

Augosoma hercules. Use of horns discussed ; Higgins, P. Liverp. Soc. xxxii. pp. lxxiv.–lxxvi.

Chalcosoma atlas, Linn., noticed ; Dohrn, S. E. Z. xliii. pp. 459 & 460.

Pentodon balearicus, Balearic Islands, *pygidialis*, Algeria, and *syriacus*, Syria, spp. nn., Kraatz, Deutsche E. Z. xxvi. pp. 60–62.

Diehodontus hexagonus, Borneo, and *grandis*, spp. nn., Sumatra, Ritsema, Notes Leyd. Mus. iv. pp. 167 & 169.

Cetoniides.

Kraatz, G. Die afrikanischen Leucoceliden und die ihnen zunächst verwandten Gattungen der Cetoniden. Deutsche E. Z. xxvi. pp. 64–78.

Chiefly consists of descriptions of new genera. The following known genera are discussed:—*Tephraea*, Burm. (type, *pulverulenta*, Gory), *Aplasta*, Schaum (type, *dichroa*, Schaum, = ♀ *lutulenta*, Schaum), *Oxythyrea*, Muls. (type, *funesta*, Poda, = *stictica*, Linn.), and *Leucocelis*, Burm. (types, *hæmorrhoidalis* and *adspersa*, Fabr., and allies).

Goliathus albo-signatus, Boh., noticed ; Dohrn, S. E. Z. xliii. p. 470. *G. higginsi*, Westw., and allies noticed ; *id. l. c.* pp. 358–361. Structure of thorax in *G. higginsi*, ♀ ; Kraatz, Deutsche E. Z. xxvi. pp. 51 & 52.

Hypselogenia concava and *albo-punctata*, Burm., discussed ; *id. l. c.* p. 204.

Eudicella thomsoni, Ancey, = *trilineata*, Qued., ? = *smithi*, Macl., var.; *id. ibid.*

Dymusia, Burm., and *Gnathocera*, Kirby, affinities discussed ; *id. l. c.* pp. 205 & 206.

Trigonophorus delesserti, Guér., *hardwicki*, Gory, and *saundersi*, Westw., discussed ; Dohrn, *l. c.* pp. 257–259.

Ischnostoma rostratum, O. Janson, figured by Waterhouse, Aid, i. pl. xciv.

Clinteria, Burm., discussed, and 2 new genera separated from it, Kraatz, *l. c.* pp. 49–51. *C. vidua*, Voll., noticed ; Dohrn, *l. c.* pp. 467 & 468. *C. infuscata*, var. *episcopalis*, from Abyssinia, described ; Ancey, Nat. Sicil. ii. p. 72.

Coptomia modesta, Waterh. Varieties described by C. O. Waterhouse, of which *C. elegans*, Waterh., is one ; Ann. N. H. (5) ix. pp. 322 & 323.

Euryomia inda, noticed and figured ; Saunders, Rep. E. Soc. Ont. 1881, p. 19, fig. 3.

Euphoria hirtipes, Horn, is myrmecophilous; Bruner & Riley, Am. Nat. xv. p. 748.

Leucocelis hæmorrhoidalis, Fabr., and allies discussed; Kraatz, *l. c.* pp. 79 & 80.

Cetonia aurata noticed; Bethune, Rep. E. Soc. Ont. 1881, pp. 84 & 85.

Protetia brevitarsis, Lewis, probably = *Cetonia submarmorea*, Burm.; Schaufuss, Nunq. Ot. iii. p. 560.

Lenosoma incanum, Macl., = *Eupœcila eburneo-guttata*, Blanch.; Waterhouse, Aid, i. p. 12.

Osmoderma eremita, Scop. Habits; Levassert & Bellier de la Chavignerie, Feuill. Nat. ii. pp. 74 & 87.

Gnorimus 10-punctatus, var. *velutinus*, from Sicily, noticed; Ragusa, Nat. Sicil. i. p. 250.

Trichius fasciatus, Linn. Varieties described; Rossi, Verh. Ver. Rheinl. xxxix. pp. 208–210.

New genera and species :—

Pseudoclinteria, Kraatz, Deutsche E. Z. xxvi. p. 50. Allied to *Clinteria*; clypeus subsinuate, hind margin of the prothorax rather broad, with very large lobe, entirely covering the scutellum; mesosternum with a slight and narrow projection; front tibiæ bidentate. Types, *C. infuscata*, Gory & Perch., and *permutans*, Burm. *C. cincticollis*, Burm., and *cariosa*, Jans., probably belong to this genus.

Amazula, id. *l. c.* p. 51. Allied to last; clypeus deeply sinuate, the borders not elevated; mesosternum with a strong projection, extending as far as the anterior femora, front tibiæ thick and strongly tridentate, tarsi very short. Type, *Clinteria suavis*, Burm. (= *tricolorata*, Westw.).

Pseudochalcothea, Ritsema, Notes Leyd. Mus. iv. p. 173. Allied to *Chalcothea*; sides of the pronotum distinctly margined, and ♂ tibiæ differently formed. Type, *C. hasselti*, Rits.; add *C. auripes*, Westw., and *virens*, Rits.

Somalibia, Lansberge, CR. Ent. Belg. xxvi. p. xxvi.; Révoil's Faune et Flore Çomal., *Col.* p. 30. Allied to *Phoxomela*; sternum short, smooth, not constricted between the intermediate tarsi; front tibiæ strongly bidentate in both sexes. Type, *S. guttifera*, sp. n., *ll. cc.*, Somali-land.

Stalagmopygus, Kraatz, *l. c.* p. 66. Allied to *Stalagmosoma*; type, *Cetonia albella*, Pall.

Leptothyrea, id. *l. c.* p. 72. Allied to *Leucocelis*; metasternum constricted between the middle coxæ. Type, *Oxythyrea perroudi*, Schaum; add *L. sticticollis*, sp. n., *l. c.* p. 73, locality not stated.

Acrothyrea, id. *l. c.* p. 76. Allied to *Leucocelis*; type, *L. rufo-femorata*, Gory.

Microthyrea, id. *l. c.* p. 76. Allied to *Leucocelis*; types, *Oxythyrea eustalacta*, Burm., and *amabilis*, Schaum (with varr. *heterospilæ*, Gerst., and *picticollis*, Kraatz, p. 78, from Zanzibar); add *Oxythyrea selika* and *flavo-maculata*, Raffr. (redescribed, p. 78, and *O. thoracica*, Schaum).

Mausoleopsis, Lansberge, *ll. cc.* pp. xxix. & 39. Shorter and stouter than typical *Leucocelis*. ♂ much larger than ♀, with very thick hind legs, femora strongly arched, and outer front claw twice as thick as the

inner, and thickened in the middle. Type, *L. amabilis*, Schaum; add *L. eustalacta*, Burm., *vandana*, Kryn., *selika*, and *rubriceps*, Raffr., and *M. albo-marginata*, pp. xxix. & 43, *funebris*, pp. xxx. & 42, and *occulata*, pp. xxx. & 41, and *revoili*, pp. xxxi. & 40, pl. i. fig. 4, spp. nn., Somali-land.

Psacadoptera, Kraatz, *l. c.* p. 67. Allied to *Pachnoda*, but elytra less parallel, head rather narrow, base of thorax more oblique on both sides, and legs shorter. Type, *P. simulatrix*, sp. n., *l. c.* p. 68, Zanzibar.

Polystalactica, id. *l. c.* p. 69. Allied to *Tephræa*; type, *Cetonia punctulata*, Fabr.; add *T. stellata*, Har.

Pseudotephræa, id. *l. c.* p. 70. Allied to *Tephræa*; types, *T. ancilla*, Har., and *Cetonia furfurosa*, Burm.

Pseudoprotætia, id. *l. c.* Allied to *Protætia*; thorax slightly rounded behind, and slightly emarginate before the scutellum. Type, *Cetonia stolata*, Oliv.; add *P. stictica*, sp. n., *l. c.* p. 71, Natal.

Stichothyrea, id. *l. c.* p. 73. Allied to *Pseudoprotætia*, &c.; type, *S. picticollis*, sp. n., *l. c.* p. 74, East Africa.

Chalcothea neglecta, Ritsema, Notes Leyd. Mus. iv. p. 171, Sumatra.

Stenotarsia (*Linotarsia*) *plagiata*, Waterhouse, Ann. N. H. (5) ix. p. 323, Fianarantsoa.

Anochilia punctatissima, id. *ibid.*, Madagascar.

Coptomia olivacea, id. *l. c.* p. 322, Fianarantsoa.

Euchræa flavo-guttata, *id. l. c.* p. 321, Fianarantsoa.

Elaphinis quadripunctata, Lansberge, CR. Ent. Belg. xxvi. p. xxiv.; Révoil's Faune et Flore Çomal., *Col.* p. 25, Somali-land.

Stalagmosoma luctuosa[*-um*], id. *ll. cc.* pp. xxv. & 38, Somali-land.

Gametis bipunctata and *angustata*, id. *ll. cc.* pp. xxv., 26, & 28, Somali-land.

Leucocelis ruficauda, p. 31, *rufo-cincta*, p. 33, *viridissima*, *albo-guttata*, p. 34, *lacrymans*, p. 36, *cinctipennis*, p. 37, *cærulescens*, p. 38 (*Oxythyrea cærulescens*, pl. i. fig. 5), id. *ll. cc.* p. xxiv., Somali-land.

Cetonia transfuga (? = *floricola*, var.) and var. *sub-albo-guttata*, Schaufuss, Bull. Soc. Ent. Fr. (6) ii. p. clxxxi., Amasia.

Buprestidæ.

Buprestidæ. Table of Belgian species; Bergé, Bull. Soc. Dinant. ii. p. 105 *et seq.*

Waterhouse, Biol. Centr. Am. *Col.* iii. (1) figures *Chrysesthes auro-notata*, Saund., *tripunctata*, Fabr., *Pelecopselaphus chevrolati*, and *acutus*, Saund., *Agæocera gigas*, Lap. & Gory, *Halecia belti*, Saund., *Trachycele blondeli*, Mars., *Hippomelas sagittatus*, Mannerh., *Psiloptera monilis*, Chevr., *Buprestis catoxantha*, *Cinyra costulata*, and *Melanophila viridi-obscura*, Lap. & Gory, pl. i. figs. 3, 2, 5 & 5*a*, 5*c*, 16, 6, 8, 10, 11, 13, & 18, *Acmæodera stellaris*, Chevr., fig. 10, and *Actenodes reichii*, Thoms., fig. 18, pl. ii.

Waterhouse figures *Chrysochroa lordi*, Walk., *Nascio carissima* and *Stigmodera tibialis*, Walk., and *Sternocera syriaca*, Saund.; Aid, i. pls. lxxxiv & xcv.; ii. pls. cxi. & cxxi.

Melanophila and *Anthaxia*, Esch., and *Xenorrhipis*, Lec., N. American species tabulated and described; Horn, Tr. Am. Ent. Soc. x. pp. 101–112.

The following synonymy is given :—*Melanophila notata*, Lap. & Gory (= *luteo-signata*, Ziegl., and *opaca*, Lec.), *longipes*, Say (= *immaculata*, Mann., and *appendiculata*, L. & G.), *drummondi*, Kirby (= *guttulata*, Mann.), *fulvo-guttata*, Harr. (= *octo-spilota*, *crocco-signata*, and *decolorata*, L. & G.), *gentilis*, Lec. (= *prasina*, Lec.), *æneola*, Mels. (= *metallica*, Lec.), *Anthaxia æneo-gaster*, L. & G. (= *inornata*, Rand., *expansa*, *strigata*, *foveicollis*, *imperfecta*, and *retifer*, Lec.), *viridifrons*, Gory (= *subænea*, Mels.), *cyanella*, Gory (= *scoriacea*, Mels.), *quercata*, Fabr. (= *cuneiformis* and *bivittata*, Gory, and *flavimana*, Gory (= *gracilis*, Mels.). Figures are given of the elytra of 6 species of *Melanophila*, and of both sexes, and ♂ antenna of *Xenorrhipis brendeli*, Lec. (pl. iv. figs. 1–9). Horn notices the ♀ antennæ of *Xenorrhipis*, l. c. ix. p. xxxv.

Iulodis onopordi, Fabr. Habits and eggs; Lucas, Bull. Soc. Ent. Fr. (6) ii. pp. civ. & cv.

Gyascutus sphenicus, Lec., = *Latipalpis saginata*, Mann.; Leconte, Tr. Am. Ent. Soc. ix. p. xxxvi.

Perotis longicollis, Kraatz, = *cuprea*, Hampe; Ganglbauer, Wien. ent. Z. i. p. 68.

Lampra bella, Gory, perhaps = *balcanica*, Kirchsb.; *id. l. c.* p. 135.

Melanophila æqualis, var. *ærata* from Sardinia noticed; Costa, Atti Acc. Nap. ix., No. 11, p. 32.

Anthaxia. Remarks on various species; Ganglbauer, *l. c.* p. 136. *A. ephippiata*, Redt., = *brevis*, Lap., and *A. lucens*, Küst., var. *phœnicea* from Beyrut is described; *id. l. c.* pp. 68 & 69. *A. rugicollis*, Luc., recorded from Arragon; Reitter, Wien. ent. Z. i. p. 167.

Conognatha paradisea and *comitessa*, Thoms., = *equestris*, Fabr., and *batesi*, Saund., respectively; Waterhouse, Ann. N. H. (5) ix. p. 52.

Sphenoptera cuprea, Ball., redescribed; Kraatz, Deutsche E. Z. xxvi. p. 316.

Corabus bifasciatus. Note on transformations; Marseul & Péragallo, Bull. Soc. Ent. Fr. (6) ii. cxlv. & cxlvi.

Aphanisticus elongatus, Villa, var. *canaliculatus* from S. Europe noticed; Schaufuss, Nunq. Ot. iii. p. 554.

New genera and species :—

Ancylotela, Waterhouse, Ann. N. H. (5) ix. p. 173. Allied to *Ptosima* and *Tyndaris*; type, *A. oculata*, sp. n., *l. c.* p. 173, Chili.

Chalcangium, id. Biol. Centr. Am. *Col.* iii. (1) p. 32. Allied to *Chrysobothris*, but more elongate, and with no impressions on the elytra; prosternal process almost simple, and anterior femora unarmed. Type, *C. longipennis*, Waterh. (MS.), from Mexico.

Sternocera æneo-castanea, Fairmaire, Révoil's Faune et Flore Çomal. *Col.* p. 48, Somali-land.

Iulodis lacunosa and *myrmido*, id. *l. c.* pp. 49 & 50, Somali-land.

Steraspis iodoloma, id. *l. c.* p. 51, Somali-land.

Chrysochroa vethi, Ritsema, Notes Leyd. Mus. iv. p. 175, Sumatra.

Chalcophora mexicana, Waterhouse, Biol. Centr. Am. *Col.* iii. (1) p. 1, pl. i. fig. 1, Mexico.

Pelecopselaphus frontalis, Chontales, and *lateralis*, Mexico, Chontales, Waterhouse, *l. c.* pp. 3 & 4, pl. i. figs. 5 *b*, & 4.

Halecia cupreo-signata and *guttata*, id. *l. c.* p. 6, pl. i. figs. 7 & 9, Chontales.

Pycnobothris dejecta and *quadrimaculata*, id. Ann N. H. (5) ix. p. 324, Fianarantsoa.

Coccinellopsis sobrina and *lævicentris*, id. *l. c.* p. 325, Fianarantsoa.

Psiloptera nigrita and *grandiceps*, Fairmaire, *l. c.* pp. 52 & 53, Somaliland; *P. simplicicollis*, id. CR. Ent. Belg. xxvi. p. xlviii., Zanzibar; *P. thoracica*, Waterhouse, *l. c.* p. 51, Mamboia, S. E. Africa; *P. chalconota*, Mexico, *simplex*, Chontales, p. 9, and *dilaticollis*, pl. i. fig. 15, Mexico, p. 11, Waterhouse, Biol. Centr. Am. *Col.* iii. (1).

Dicerca inconspicua, p. 11, *æneo-varia*, fig. 14, and *propinqua*, fig. 12, p. 12, *id. l. c.*, Mexico; *D. obtusa*, Kraatz, Deutsche E. Z. xxvi. p. 112, Margelan.

Lampra tuerki, Ganglbauer, Wien. ent. Z. i. p. 135, Astrabad.

Nascio carissima, Waterhouse, Ann. N. H. (5) ix. p. 50, North Australia.

Buprestis piliventris, pl. i. fig. 17, p. 13, *biplagiata*, *ventralis*, p. 14, and *picta*, p. 15, *id.* Biol. Centr. Am. *Col.* iii. (1), Mexico.

Cinyra frontalis, id. *l. c.* p. 15, pl. i. fig. 19, Mexico.

Melanophila limbata, id. *l. c.* p. 16, Panama, Chontales; *M. intrusa*, California, Nevada, and *obtusa*, Georgia, Horn, Tr. Am Ent. Soc. x. pp. 105 & 106.

Tetragonoschema humeralis, Waterhouse, *l. c.* p. 17, pl. ii. fig. 1, Guatemala.

Cratomerus fariniger, Kraatz, *l. c.* p. 314, Samarcand.

Anthaxia urens, Antilibanus, *ignipennis*, Marseilles, p. cxlvi., *israelita*, Jaffa, Ramleh, and *togata*, Syria, p. cxlvii., Abeille, Bull. Soc. Ent. Fr. (6) ii.

Curis corusca, Waterhouse, Ann. N. H. (5) ix. p. 51, Australia.

Conognatha interrupta, id. *l. c.* p. 52, Bogota; *C. octo-guttata*, Mexico, and *bifasciata*, Chiriqui, *id.* Biol. Centr. Am. *Col.* iii. (2) p. 19, pl. ii. figs. 3 & 8.

Ptosima læta, id. *l. c.* p. 20, Mexico, *P. bowringi*, China, and *apicata*, India, *id.* Ann. N. H. (5) ix. p. 172.

Acmæodera regularis, fig. 2, Costa Rica, p. 21, *flavo-sparsa*, fig. 4, Mexico, p. 22, *superba*, fig. 5, Mexico, Brazil, p. 23, *picta*, fig. 6, *flavo-sticta*, fig. 13, p. 24, *venusta*, fig. 12, *longipennis*, fig. 11, p. 25, *setosa*, fig. 9, p. 26, and *exilis*, fig. 7, Mexico, p. 27, *id.* Biol. Centr. Am. *Col.* iii. (1) pl. ix.; *A. observata*, Ancey, Le Nat. ii. p. 62, E. Africa.

Sphenoptera jugulata and *lævicentris*, Fairmaire, Révoil's Faune et Flore Çomal. *Col.* pp. 54 & 55, Somali-land; *S. margelanica*, p. 112, *olivacea*, Margelan, p. 113, *purpuriventris*, p. 314, *dubia*, *propinqua*, p. 315, *lucidicollis*, p. 316, *viridi-cærulea*, *æneo-micans*, p. 317, *viridi-aurea* and *subtricostata*, Samarcand, p. 318, Kraatz, *l. c.*; *S. purpurascens*, Waterhouse, *l. c.* p. 28, pl. ii. fig. 14, Honduras.

Actenodes fuliginea, fig. 15, Chontales, p. 29, *bifasciata*, fig. 16, Mexico, *lævifrons*, fig. 17, Chontales, p. 30, *undulata*, fig. 20, Mexico, British Hon-

duras, Guatemala, Nicaragua, and *humeralis*, fig. 19, Chontales, p. 31, *id.* l. c. pl. ii.

Chrysobothris æneifrons, Fairmaire, Révoil's Faune et Flore Çomal. *Col.* p. 53, Somali-land.

Eucnemidæ.

Eucnemis emyi, Rouget, is omitted in recent catalogues; Bedel, Bull. Soc. Ent. Fr. (6) ii. p. cxliv.

Cryptostoma dohrni, Horn, noticed and figured by him; Tr. Am. Ent. Soc. x. p. 124, pl. vi. fig. 13.

Hylotastes terminatus, sp. n., Pascoe, Ann. N. H. (5) ix. p. 26, Waterhouse, Aid, ii. pl. ciii., Sarawak.

Elateridæ.

Candèze, E. Elatérides nouveaux. 3me fascicule. Mém. Liège (2) ix. pp. 1–117.

242 new species described, including many new genera.

Horn discusses the characters of the *Elateridæ* (Tr. Am. Ent. Soc. x. pp. iii. & 122–124). He regards the *Buprestidæ* and *Throscidæ* as two wholly independent families, and gives the following table of the other groups :—

Posterior coxæ laminate. Trochanters small.
Labrum concealed; ungues simple; antennæ somewhat distant from the eyes, their insertion narrowing the front . . . *Eucneminæ*.
Labrum visible, free; ungues variable; antennæ arising near the eyes, front not narrowed . . . . . *Elaterinæ*.
Labrum transversely connate with the front.
Ventral segments six; ungues simple; antennæ as in the *Elaterinæ*; tibial spurs well developed . . . . . *Cebrioninæ*.
Ventral segments five; ungues serrate; antennæ slightly distant from the eyes, front narrow; spurs moderate . . *Perothopinæ*.
Posterior coxæ not laminate. Trochanters of middle and posterior legs very long.
Labrum short, transverse, connate with the front; front gibbous; ungues serrate. . . . . *Cerophytinæ*.

6 *Elateridæ* from the Crimea noticed; Von Heyden, Deutsche E. Z. xxvi. p. 154.

Effect of rape-cake on wireworms; Ormerod, P. E. Soc. 1882, p. xix.

Alaus oculatus, popularly described and figured; Saunders, Rep. E. Soc. Ont. 1881, pp. 21 & 22, fig. 8.

Eudactylus discoidalis, Cand., occurs at Natal, and not in America; E. W. Janson, Cist. Ent. iii. p. 37.

Tricrepidius triangulicollis, Motsch., = *Ischiodontus ferreus*, Lec.; Horn, *l. c.* p. v.

Drasterius bimaculatus and *Heteroderes crucifer*, Rossi. Various forms discussed; Letzner, JB. schles. Ges. lix. pp. 350–352.

Megapenthes and *Melanoxanthus*. Characters compared; Candèze, Mém. Liège (2) ix. p. 70.

Megapenthes volxemi, Cand., and var. *retowskii* from the Crimea noticed; Von Heyden, *l. c.* p. 155.

Cryptohypnus, Esch.: varieties of German species discussed; Letzner, *l. c.* pp. 352–354. *C. angularis*, Cand. (= *exilis*, Cand.), noticed; Von Heyden, *l. c.* p. 45.

Cardiophorus syriacus, Linn., noticed; Ragusa, Nat. Sicil. i. p. 231.

Athous niger, Linn., var. *alpinus*, Redt., with malformed antennæ; Letzner, *l. c.* p. 355.

Pyrophorus noctilucus noticed; White's "Cameos from the Silver Land," ii. pp. 302 & 303. Colour of its light; Turner, Psyche, iii. p. 309.

Adrastus limbatus, Fabr., var. *porrectifrons*, from Grande-Chartreuse and Savoy, described; Des Gozis, Rev. d'Ent. i. p. 197.

Agriotes scapulatus, Cand., referred to *Betarmon*; Candèze, *l. c.* p. 74.

Hemiops semperi. Varieties from Sumbawa noticed; *id. l. c.* p. 107.

New genera and species:—

Anaspasis, Candèze, Mém. Liège (2) ix. p. 4. An anomalous genus, apparently allied to *Protelater* and *Anacantha*; type, *A. fasciolata*, sp. n., *l. c.* p. 5, Chili, Patagonia.

Tarsalgus, id. *l. c.* p. 39. Allied to *Dicronychus*; type, *D. mechowi*, sp. n., *l. c.*, Congo.

Apochresis, id. *l. c.* p. 46. Differs from *Dorygonus* by its narrow hind coxæ; type, *A. asper*, sp. n., *l. c.*, Benguela.

Parelater, id. *l. c.* p. 70. Not characterized; type, *Elater coccineus*, Cand.

Antitypus, id. *l. c.* Not characterized; type, *Elater insignitus*, Fairm.

Homotechnes, id. *l. c.* p. 71. Allied to *Hypsilostethus*; type, *H. corymbitoides*, sp. n., *l. c.*, Moupiu.

Pseudiconus, id. *l. c.* p. 76. Intermediate between the *Athoites* and *Cryptohypnites*; type, *P. mendax*, sp. n., *l. c.*, Chili.

Paraphileus, id. *l. c.* p. 94. Differs from *Pyrophorus* by its broad prothorax and elytra; type, *Aphænobius thoreyi*, Germ. (redescribed, *l. c.* p. 95).

Hifo, id. *l. c.* p. 94. Allied to *Pyrophorus*; type, *H. pacificus*, sp. n., *l. c.*, Tonga Tabu.

Diadysis, id. *l. c.* p. 98. Allied to *Chrosis*, *Melanactes*, &c.; type, *D. morsii*, sp. n., *l. c.* p. 99, Cape York.

Microdesmes, id. *l. c.* p. 99. Not characterized; allied to last; type, *Cardiophorus mastersi*, Macl.

Osorno, id. *l. c.* p. 100. Affinities doubtful; placed provisionally with the *Corymbitites*; type, *O. ambiguus*, sp. n., *l. c.*, Patagonia.

Parasaphes, id. *l. c.* p. 101. Allied to *Asaphes*; front smooth, pointed at the extremity; prosternal lateral sutures broad, shining, not canaliculated. Type, *P. elegans*, sp. n., *l. c.*, Queensland.

Adolesches, id. *l. c.* p. 107. Allied to *Hemiops*; type, *A. crinitus*, sp. n., *l. c.* p. 108, Uruguay.

Agrypnus soricinus, New Guinea, and *pacificus*, Woodlark Island, *id. l. c.* p. 1.

Adelocera altaica, Altai, and *massula*, Mexico, *id. l. c.* p. 2; *A. tristis* and *incompta*, Kraatz, Deutsche E. Z. xxvi. p. 319, Samarcand; *A. funebris*, Solsky, Troudy Ent. Ross. xii. p. 231, Sarafschan.

Dilobotarsus filiformis and *bacillus*, Candèze, *l. c.* p. 3, Abyssinia.

Anacantha fairmairii, id. *l. c.*, Chili.

Lacon decoratus, Madagascar, *sub-ocellatus*, Nossi-Bé, *signatus*, Zanzibar, p. 6, *æthiopicus*, Bogos, *caffer*, Caffraria, p. 7, *colonicus*, Cochin China, *setulosus*, Sumbawa, Flores, *spretus*, Borneo, p. 8, *delesserti*, Nilgherries, *pardalinus*, Darjiling, p. 9, *limosus*, New Guinea, *gibbus*, *compactus*, p. 10, *rubiginosus*, N. Australia, *macleayi*, Port Denison, *castelnaui*, p. 11, *corvinus*, Swan River, *monachus*, Victoria, p. 12, *palpalis*, N. Australia, and *dealbatus*, Cape York, p. 13, *id. l. c.*

Tilotarsus sub-oculatus, p. 15, *depressus*, Madagascar, and *reductus*, Gaboon, p. 16, *id. l. c.*

Ischius biplagiatus, E. W. Janson, Cist. Ent. iii. p. 36, pl. i. fig. 6, Ecuador.

Hemirrhipus elegantissimus, Candèze, *l. c.* p. 20, La Plata.

Chalcolepidius mniszechi, Mexico, *cyaneus*, Brazil, p. 21, and *humboldti*, Bogota, p. 22, *id.* l. c.; *C. buckleyi*, E. W. Janson, *l. c.* p. 33, pl. i. fig. 4, Ecuador.

Semiotus formosus and *carus*, id. *l. c.* p. 34, pl. i. figs. 1 & 2, Ecuador; *S. splendidus*, Candèze, *l. c.* p. 23, Ecuador.

Campsosternus lansbergii, p. 25, *tæniatus*, Java, and *carinatus*, Borneo, *id. l. c.* p. 24; *C. atavus*, Deichmüller, Verh. L.-C. Ak. xlii. p. 306, pl. xxi. figs. 4*a-c*, Kutschlin (fossil).

Pectocera malaisiana, Candèze, *l. c.* p. 24, Celebes.

Alaus dohrni, Monrovia, *crokisii*, Grand-Bassam, *hacquardi*, Zanzibar, p. 15, *pantherinus*, Mindanao, p. 16, *laportii*, Malacca, *colffsi*, Sumbawa, Flores, *hurria*, Sumatra, p. 17, *acontias*, New Guinea, p. 18, *oreas*, Celebes, *lansbergii*, Java, p. 19, and *griseus*, Rio Magdalena, p. 20, *id. l. c.*

Telralobus livingstonii, Zambesi, *rubiginosus*, Monrovia, p. 25, *raffrayi*, Abyssinia, *dohrni*, Guinea, p. 26, and *capucinus*, N. Australia, p. 27, *id. l. c.*

Pantolamprus dohrni, id. *l. c.* p. 27, Monrovia; *P. auratus*, id. Notes Leyd. Mus. iv. p. 158, Liberia.

Psephus guineensis, N. Guinea, p. 27, *oberthueri*, *militaris*, p. 28, *nigricornis*, Zanzibar, *mechowi*, Congo, *melancholicus*, Caffraria, p. 29, *raffrayi*, Zanzibar, *morio*, Monrovia, p. 30, *athoides*, Angola, *tabidus*, Caffraria, p. 31, *correctus*, *juvenilis*, p. 32, *minor*, Gaboon, *murrayi*, *nitidus*, Calabar, p. 33, *dentatus*, *sanguinolentus*, Gaboon, p. 34, *nobilis*, *rufinus*, Ceylon, *papuensis*, New Guinea, p. 35, *lateralis*, Sumbawa, and *subfuscus*, Ternate, p. 36, *id.* Mém. Liège (2) ix.

Dicronychus hacquardi, Zanzibar, p. 36, *psephoides*, Delagoa Bay, *granulatus*, *mandibularis*, Caffraria, p. 37, and *tritus*, Transvaal, p. 38, *id. l. c.*

Anoplischius egaensis, Ega, *rusticus* and *suturalis*, Brazil, p. 40, *melanoloides*, Brazil, *elegantulus*, Bogota, and *œoloides*, Colombia, p. 41, *id. l. c.*

Ischiodontus hawaiiensis, Sandwich Islands, and *decoratus*, Brazil, Candèze, *l. c.* p. 42.

Stilus brevis, id. *l. c.* p. 43, Amazon.

Dicrepidius cavifrons, id. *ibid.* Guadeloupe.

Eudactylus bifoveatus, id. *ibid.*, Antilles; *E. prodigus* and *castus*, E. W. Janson, *l. c.* pp. 35 & 36, pl. i. figs. 3 & 5, Ecuador.

Glypheus lansbergii, Candèze, *l. c.* p. 44, Victoria.

Simodactylus tertius, id. *ibid.*, New Guinea.

Melanthoides luteipes, id. *l. c.* p. 45, Zanzibar.

Glyphochilus championi, Champion Bay, and *occidentalis*, Swan River; *id. ibid.*

Monocrepidius alacer, Brazil, *rodriguezi*, Guatemala, p. 47, *fossulatus*, Brazil, *vulneratus*, Mexico, *lenis*, Amazons, p. 48, *calcaratus*, Brazil, p. 49, *concretus*, Cayenne, *figularis*, Haiti, *probus*, Guatemala, p. 50, *monachus*, Bangkok, *capucinus*, Cochin China, p. 51, *antennalis*, Champion Bay, *aurulentus*, Swan River, *plagiatus*, Rockhampton, p. 52, *spatulatus*, New South Wales, *amazonicus*, Amazons, p. 53, *id. l. c.*

Æolus waggæ, New South Wales, *versicolor*, Swan River, *steinheili*, Bogota, p. 54, *livens*, Ega, *pectoralis*, Venezuela, p. 55, and *unicolor*, Ega, p. 56, *id. l. c.*

Heteroderes æoloides, Gaboon, *crux*, p. 56, *juvencus*, Abyssinia, *cryptohypnoides*, Persia, p. 57, and *arechavaletæ*, Montevideo, p. 58, *id. l. c.*

Physorrhinus insularis, id. *l. c.* p. 58, Guadeloupe.

Anchastus fasciatus, p. 58, *bicolor*, Ega, *militaris*, California, *brevis*, Bogota, p. 59, *raffrayi*, Abyssinia, *klugi*, Tropical Africa, p. 60, *lugubris*, *pectoralis*, Gaboon, *unicolor*, Mindanao, p. 61, *id. l. c.*

Drasterius æthiopicus and *brevipennis*, id. *l. c.* p. 62, Abyssinia.

Elastrus senegalensis, id. *l. c.* p. 64, Cazamanca.

Elater cœnobita, Costa, Atti Acc. Nap. ix. (6) p. 34, fig. 3, Calabria; *E. violaceipennis*, p. 62, *horni*, *partitus*, California, p. 63, and *asperulus*, Australia, p. 64, Candèze, *l. c.*

Elaterites dicrepidioides, Deichmüller, *l. c.* p. 308, pl. xxi. figs. 5 *a–e*, Kutschlin (fossil).

Megapenthes reedi, Chili, p. 64, *funebris*, Moupin, *longus*, Siam, *jocosus*, Malacca, p. 65, *sondanicus*, Java, *octo-guttatus*, Moupin, and *brasilianus*, Brazil, p. 66, Candèze, *l. c.*

Melanoxanthus ducalis, Celebes, *lansbergii*, Sumatra, p. 67, *florensis*, Flores, *filiformis*, Celebes, *ardjoenicus*, p. 68, *nigritulus*, Java, *inæqualis*, Gaboon, *dilaticollis*, Queensland, and *cuneiformis*, New South Wales, p. 69, *id. l. c.*

Deromecus carinatus, *tumidus*, *tenuicollis*, p. 72, *anchastinus*, and *cerrinus*, p. 73, *id. l. c.*, Chili.

Smilicerus zonatus, id. *l. c.* p. 74, Bogota.

Betarmon anatolicus, Smyrna, and *sharpi*, New Zealand, *id. ibid.*

Cryptohypnus davidianus, Moupin, *oberthueri*, New Granada, p. 75, *atomarius*, Darjiling, and *æqualis*, Uruguay, p. 76, *id. l. c.*

Cardiophorus microcephalus, Morocco, p. 77, *inflatus*, Manchuria, *erythrurus*, Moupin, p. 78, *regularis* and *folliculus*, Zanzibar, *jocosus*, Abyssinia, p. 79, *gagatinus*, Abyssinia, *rudis*, Nubia, *davidianus*, p. 80,

devius, Moupin, *acuminatus*, Caffraria, p. 81, *burdoi* (cf. also Fairmaire, CR. Ent. Belg. xxvi. p. xlviii.), *usagaræ*, Usagara, *ligneus*, Madagascar, p. 82, *compactus*, and *despectus*, Melbourne, p. 82, *id.* l. c.; *C. olgæ*, Samarcand, and *blandus*, Sarafschan, Solsky, *l. c.* pp. 233 & 235; *C. picticollis*, Kraatz, *l. c.* p. 320, Samarcand.

Horistonotus basilaris, Para, *rufiventris*, *pedestris*, Guatemala, p. 84, *arechavaletæ*, Uruguay, and *minimus*, Rio Janeiro, p. 85, Candèze, *l. c.*

Esthesopus apicatus, Mexico, and *bellus*, Ega, *id. l. c.* p. 85.

Diploconus nigripennis, Sumatra, *umbilicatus*, Java, p. 86, and *barbus*, Menado, p. 87, *id. l. c.*

Melanotus desbrochersi, Azores, p. 87, *incallidus*, Assam, *brevis*, Cochin China, *carbonarius*, p. 88, and *sciurus*, p. 89, China, *nuceus*, and *arctus*, Moupin, p. 89, *id. l. c.*

Limonius villiger, Solsky, *l. c.* p. 237, Tashkend.

Athous jocosus, Candèze, *l. c.* p. 90, Amoor.

Pyrophorus scintillula, Para, *trinotatus*, Brazil, p. 91, and *notatissimus*, Surinam, p. 92, *id. l. c.*

Corymbites lecontii, California, p. 94, *morosus*, Cochin China, *litura*, p. 95, *ambiguus*, Victoria, *centralis*, Moupin, *sulcatus*, Silesia, p. 96, and *elegans*, California, p. 97, *id. l. c.*

Chrosis lansbergii, id. *l. c.* p. 97, New South Wales.

Hapatesis hirtellus, id. *l. c.* p. 98, New Guinea.

Cardiorrhinus latipennis, Brazil, and *tactus*, Ega, *id. l. c.* p. 102.

Ludius schaumi, Greece, *sinensis*, China, *sihleticus* [*sic*], Sylhet, p. 103, *anchastinus*, Moupin, and *hydropicus*, Queensland, p. 104, *id. l. c.*

Agriotes tauricus, Von Heyden, Deutsche E. Z. xxvi. p. 155, Crimea.

Silesis cordubensis, id. *l. c.* p. 45, Andalusia.

Agonischius militaris, Andamans, and *longicornis*, New South Wales, Candèze, *l. c.* pp. 104 & 105.

Ochosternus gigas, id. *l. c.* p. 105, New Caledonia.

Hemiops acutangulata, Pulo-Penang, p. 105, *sinensis*, Shanghai, and *longa*, Sumatra, p. 106, *id. l. c.*

Glyphonyx antiquus, id. *l. c.* p. 108, New Granada.

Cebrionidæ.

Cebrio apicalis, sp. n., Chevrolat, Bull. Soc. Ent. Fr. (6) ii. p. iv., Salamanca.

Rhipidoceridæ.

Callirrhipes blanchii, Chevr., belongs to *Arrhaphipterus*; Ganglbauer, Wien ent. Zeit. i. p. 136.

Dascyllidæ.

Eubria palustris, Germ., ♀ has simple claws; Waterhouse, Ent. M. M. xiv. p. 118.

Cyphon cartusiensis, Des Gozis, Rev. d'Ent. i. p. 197, St. Pierre de-Chartreuse; *C. variegatus*, Sharp, Tr. E. Soc. 1882, p. 87, New Zealand.

Telephoridæ.

Lycides.

Bourgeois, J. Monographie des Lycides de l'ancien monde. L'Ab. xx. pp. 1–96.

A most elaborate monograph, but containing little new. The part now published extends to the genus *Platycis*, Thoms.

H. S. Gorham notices the characters of *Conderis*, *Xylobanus*, *Ditoneces*, and *Lyropœus*; Notes Leyd. Mus. iv. pp. 88, 96, 99, & 100, notes.

Calopteron gorhami, Bourgeois, redescribed by him; Ann. Soc. Ent. Fr. (6) ii. p. 141.

Homalisus unicolor, Costa, noticed as new to France; *H. sanguinipennis*, Cast., is not French, the supposed French specimens being referable to *Platycis cosnardi*, Chevr. A list of the 6 known species of *Homalisus* with their localities is added; Bourgeois, Bull. Soc. Ent. Fr. (6) ii. pp. c. & ci. *H. taurinensis*, Bon., recorded from Nice; *id. l. c.* p. lxxxvi.

Adoceta, g. n., Bourgeois, Bull. Soc. Ent. Fr. (6) ii. p. lxxxvi., L'Ab. xx. pp. 55 & 96. Allied to *Lygistopterus*; mouth not prolonged into a rostrum. Type, *A. caroli*, sp. n., *l. c.* p. 97, Algeria [p. 97 issued in 1883].

New species:—

Lycus revoili, pl. i. fig. 6, and *consobrinus*, Bourgeois, Révoil's Faune et Flore Çomal. *Col.* pp. 44 & 46, Somali-land.

Metriorrhynchus pellitus, p. 93, *cinnabarinus*, *purpurascens*, p. 94, *amœnus*, *luteus*, p. 95, and *infuscatus*, p. 96, Gorham, Notes Leyd. Mus. iv.; also in Veth's Midden-Sumatra, iv. pt. 6, *Col.* pp. 60–62, Sumatra.

Cautires ocularis, Bourgeois, Bull. Soc. Ent. Fr. (6) ii. p. ci., Gaboon.

Xylobanus reticulatus, p. 96, *X.* (?) *dimidiatus*, and *X. tinctus*, p. 97, Gorham, *ll. cc.*, Sumatra.

Conderis miniatus, id. *ll. cc* pp. 98 & 64, Sumatra.

Ditoneces rufo-brunneus, pp. 99 & 64, *tricolor*, pp. 99 & 65, *flavicolor*, pp. 100 & 65, *ll. cc.*, Sumatra.

Lyropœus waterhousii and *ritsemæ*, id. *ll. cc.* pp. 100, 101, & 66, Sumatra.

Callimerus ornatus, id. Notes Leyd. Mus. iv. p. 110, Sumatra.

Emplectus atricollis and *erichsoni*, Bourgeois, Ann. Soc. Ent. Fr. (6) ii. p. 142, Colombia.

Plateros citrinicollis, p. 143, *antennalis* and *chrysomelas*, p. 144, *id. l. c.*, New Granada.

Lampyrides.

Wielowiejski, H. v. Studien über die Lampyriden. Z. wiss. Zool. xxxvii. pp. 354–428, pls. xxiii. & xxiv.

After an historical and critical introduction, the author treats of the method of investigation; the parenchyma of the luminous organs (under which he discusses the luminous ventral organs of the sexually mature animal, and the lateral luminous organs of the female and larva); the tracheal system of the luminous organs; the nervous system; the fatty portions; the cuticle; the organological position of the luminous organs;

physiology; and general observations. The paper concludes with a short bibliography. The author sums up his principal conclusions as follows:—

1. The so-called "terminal cells of the tracheæ," discovered by Schultze, which become black on the application of osmic acid, are not the actual terminations of the respiratory tubes. The latter branch in their interior into much finer capillaries, not provided with spiral chitin, which are very long, covered by peritoneal membrane, and thickly scattered through the luminous substance.

2. These tracheal capillaries rarely form blind terminations in the luminous organs, but generally anastomose with one another, forming a kind of irregular net.

3. These structures do not penetrate the cells of the parenchyma, but wind irregularly round their outer surface.

4. The terminal cells of the tracheæ are only the expanded peritoneal layer at the base of the tracheal capillaries, which issue in pencils from a trachea provided with chitinous spirals; their peripheral extensions connect the latter with the capillaries. This is to be regarded as homologous with certain embryonic conditions of the tracheal system.

5. The "terminal ends of the tracheæ" are not the seat of light, or the point from which it proceeds. If it first appears in their neighbourhood, it is only because these structures have stored up gas by their affinity with acid, and give it out in greater quantity at their neighbouring parenchym cells.

6. The light-producing property is inherent in the parenchym cells of the light-producing organs. It is produced by the slow oxidation of a substance formed under the influence of the nervous system.

7. The parenchym cells, of which the two layers enveloping the ventral light-producing organs consist, are perfectly similar in their morphological peculiarities (size, form, and relationship to the tracheæ and nerves). The difference between them consists only in the chemical properties of their contents.

8. All (?) the parenchym cells are bound together by the fine branching terminations of nerves.

9. The luminous organs are morphologically identical with the fatty bodies.

Lampyris noctiluca. Note on habits; it is luminous in all stages; the emission of its light is voluntary: Laboulbène, Ann. Soc. Ent. Fr. (6) ii. p. 316. Spectrum of light; Conroy & Spiller, Nature, xxvi. pp. 319 & 343.

Colour of the light emitted by *Photuris pennsylvanica* and *Photinus pyralis*; Turner, Psyche, iii. p. 309.

Vesta sumatrensis, sp. n., Gorham, Notes Leyd. Mus. iv. p. 102, and Midden-Sumatra, *Col.* p. 67, Sumatra.

Lampyris brutia, sp. n., Costa, Atti Acc. Nap. ix. (6) p. 34, fig. 4, Calabria.

Diaphanes fuscipennis, sp. n., Gorham, *ll. cc.* pp. 103 & 69, Sumatra.

Luciola cerea and *picea*, spp. nn., *id. ll. cc.* pp. 103, 104, & 70, 71, Sumatra.

Telephorides.

New genera and species :—

Silotrachelus, Solsky, Troudy Ent. Ross. xiii. p. 31. Allied to *Tryphérus*, *Ichthyurus*, and *Lobetus*. Types, *S. semirufus*, Kisil-Kum, and *xanthoderus*, Tashkend, spp. nn. ; *l. c.* pp. 33 & 35.

Apodistrus, Reitter, Wien. ent. Zeit. i. p. 30. Allied to *Malthodes* ; ♀ apterous. Type, *M. brachypterus*, Kies. (figured, p. 31).

Telephorus viridanus, p. 105 (p. 71), *varicornis*, *angusticollis*, p. 106 (p. 72), and *sordidus*, p. 107, Gorham, Notes Leyd. Mus. iv. [*cf.* also Midden-Sumatra, *Col.* pp. 71 & 72], Sumatra; *T. bubsequa* [sic], Des Gozis, Rev. d'Ent. i. p. 198, Armenia.

Polemius (?) (Waterh., *nec* Lec.) *depressus*, Gorham, Notes Leyd. Mus. iv. p. 107, Sumatra.

Silis hamatus and *simplex*, id. *l. c.* pp. 108 & 109, Sumatra.

Malthinus (*Ichthyurus* ?) *paradoxus*, Dohrn, S. E. Z. xliii. p. 460, Olivenza, Amazons.

Melyrides.

Abeille de Perrin, E. Supplement à la Monographie des Malachiides d'Europe et des pays voisins. Nat. Sicil. i. pp. 110–115, 137–142, 145–149, 176–179.

Contains descriptions of new species, synonymic and other notes (not further mentioned here), &c.

Collops, Erichs. Gorham, Biol. Centr. Am. *Col.* iii. (2) pl. viii., figures *C. aulicus*, figs. 21 & 22, *vittatus*, Say, fig. 23, *basalis*, Erichs., fig. 25 (as *rufipennis* ; variation noticed, p. 116).

Myrmecospectra nietneri, Motsch. Generic characters discussed ; it is allied to *Collops* : Horn, Tr. Am. Ent. Soc. x. pp. 124 & 125, pl. vi. figs. 18 & 19.

Malachius heydeni, Abeille, is from Caramania ; Ragusa, Nat. Sicil. i. p. 240.

Attalus panormitanus, Rag., = *ragusæ*, Schauf. ; *A. ragusæ*, Abeille, renamed *postremus* ; Abeille, Bull. Soc. Ent. Fr. (6) ii. p. cxxv.

Ebæus bulbifer, Kol., redescribed ; Abeille, Nat. Sicil. i. p. 147.

New genera and species :—

Chætomalachius, Kraatz, Deutsche E. Z. xxvi. p. 96. Allied to *Hapalochrus* ; antennæ eleven-jointed, slender, slightly thickened towards the tip. Type, *C. dasytoides*, sp. n., *l. c.* p. 97, Margelan.

Eulobonyx, id. *l. c.* p. 97. Allied to *Lobonyx*, but much larger, and with some resemblance to *Cerocoma*. Type, *E. turkestanicus*, sp. n., *l. c.* p. 98, Margelan.

Dromanthus, Gorham, Biol. Centr. Am. *Col.* iii. (2) p. 121. Allied to *Lemphus* and *Carphurus* ; antennæ eleven-jointed, serrate ; head slightly produced ; tarsi four-jointed, joints two and three bilobate ; claws simple ; elytra ample, scarcely broader behind, and covering the abdomen ; wings present. To include *D. opacus*, Mexico, *decipiens*, fig. 5, Panama, *quadri-*

maculatus, fig. 4, Chontales, p. 122, and *jucundus*, fig. 6, Panama, pl. vii. p. 123; spp. nn.

Melyrodes, id. *l. c.* p. 128. Allied to *Melyrosoma*, Woll., head shorter, antennæ much shorter in proportion, not serrate, body less depressed, elytra with faint traces of one, or at most two, raised lines. Type, *M. crenata*, sp. n., *l. c.*, Guatemala.

Mecomycter, Horn, Tr. Am. Ent. Soc. x. p. 125. Head prolonged as in *Arthrobrachus*; simple ungues as in *Melyris*; tarsi as in *Dasytes*. Type, *M.* [*h*]*omalinus*, sp. n., *l. c.* p. 126, pl. vi. fig. 17, Kansas.

[*H*]*Apalochrus notaticollis*, Kisil-Kum, and *fedtschenkoi*, Sarafschan, Solsky, Troudy Ent. Ross. xiii. pp. 38 & 39.

Collops femoralis, Gorham, Biol. Centr. Am. *Col.* iii. (2) p. 113, Guatemala.

Malachius hastulifer, Taschkent, p. 238, *flabellicornis*, p. 240, *kiesenwetteri*, p. 242, *uncicornis*, Sarafschan, p. 245, and *obtusicornis*, Varsaminor, p. 248, Solsky, l. c.; *M. flammeus*, Syria, *opacipennis*, Lebanon, *limbicollis*, Spain, *heydeni*, locality unknown, *falcifer*, Caucasus, Hungary, and *M.* (*Chionotopus*) *6-plagiatus*, Jericho, Abeille, Nat. Sicil. i. pp. 110–115.

Axinotarsus alticola, id. *l. c.* p. 138, Syria.

Attalus marginicollis, Kraatz, Deutsche E. Z. xxvi. p. 320, Samarcand; *A. sericans*, p. 118, *limbatus*, *anthobioides*, Guatemala, *scutellaris*, Mexico, Guatemala, p. 119, *caraboides*, Guatemala, and *nigritulus*, Mexico, p. 120, Gorham, l. c.; *A. dasytoides*, p. 180, [*h*]*omophloides*, *cupreonitens*, p. 181, and *A.* (?) *paradoxus*, p. 182, Abeille, Rev. d'Ent. i.; *A. perforatus*, Bône, and *coloratus*, Balearic Islands, p. 140, *convolvuli*, Teniet El Haad, p. 145, and *ragusæ*, Sicily, p. 146, *id.* Nat. Sicil. i.

Antholinus (*Attalus*) *tenietensis*, id. *l. c.* p. 139, Algeria.

Anthocomus gratissimus and *semipolitus*, id. *l. c.* pp. 137 & 138, Syria; *A. coccineo-varius*, Solsky, *l. c.* p. 249, Samarcand; *A. plagiatus*, *maculosus*, pl. vii. fig. 1, Guatemala, p. 115, *pusillus*, pl. vi. fig. 24, Mexico, *discimacula*, p. 116, *æneo-picipennis*, *sapphirinus*, Mexico, and *nigro-æneus*, Guatemala, p. 117, Gorham, *l. c.*

Ebæus mediterraneus, Abeille, *l. c.* p. 148, Crimea, Sicily, Balearic Islands; *E. æneo-virens*, Gorham, *l. c.* p. 121, pl. vii. fig. 2, Guatemala; *E.* (?) *kokandicus* (Ersch., MS.), Solsky, *l. c.* p. 41, Kokand.

Pelochrus pallidus (Muls., MS.), Abeille, *l. c.* p. 146, Granada.

Hypebæus tenuicollis, id. *l. c.* p. 149, Syria.

Dasytes helmsi, Sharp, Tr. E. Soc. 1882, p. 66, New Zealand.

Pristoscelis nigro-æneus, Mexico, *pubescens*, pl. vii. fig. 10, Mexico, and *salvini*, Guatemala, Gorham, *l. c.* p. 124.

Listrus cupreo-nitens, pl. vii. fig. 8, *subcyaneus*, Guatemala, *æneus*, Mexico, Guatemala, p. 125, *versicolor*, Guatemala, *punctatus*, Mexico, Guatemala, p. 126, *corallipes*, Mexico, Guatemala, and *metallicus*, Guatemala, p. 127, *id. l. c.*

Haplocnemus variolatus, Costa, Atti Acc. Nap. ix. (6) p. 35, fig. 5, Calabria.

Cerallus kiesenwetteri, Solsky, *l. c.* p. 44, Sarafschan; *C. kiesenwetteri*, Kraatz, *l. c.* p. 98, Margelan [? same species].

Astylus vittatus, Gorham, *l. c.* p. 127, pl. vii. fig. 9, Panama, Venezuela.

Melyris limbifera and *marginicollis*, p. 62, *versicolor*, p. 78, Antoy, Le Nat. ii., Somali-land; *M. ruficrus*, Fairmaire, Bull. Soc. Ent. Fr. (6) vi. p. clxxxix., Tripoli; *M. incompleta*, id. CR. Ent. Belg. xxvi. p. xlix., Zanzibar; *M. semihirta*, p. 56, *v[i]ridinitens*, p. 57, *versicolor*, p. 58, *collaris*, *discoidalis*, p. 59, *rubro-cincta*, p. 60, and *incostata*, p. 61, Fairmaire, Révoil's Faune et Flore Çomal. *Col.*, Somali-land.

Cleridæ.

Gorham, Biol. Centr. Am. *Col.* iii. (2) figures the following known species:—*Cymatodera sallæi*, Thoms., fig. 13, *discoidalis*, Chevr., figs. 13 & 15, *marmorata*, Klug, fig. 14, *Colyphus quadrilineatus*, Chevr., figs. 20 & 21, *mutabilis*, Chevr., fig. 23, pls. vii. & viii. fig. 1, *distinctus*, Chevr., fig. 19, and *signaticollis*, Spin., fig. 22, *Phonius sanguinipennis*, Chevr., fig. 24, pl. vii., *Clerus quadrinodosus*, Chevr., figs. 4 & 19, *concinnus*, Gorh., fig. 12, *cylindricus*, Gorh., fig. 6, *atriceps*, Gorh., fig. 21, *Sallæa necrobioides*, Chevr., fig. 15, *Epiphlæus setulosus*, Thoms., fig. 24, pl. viii. and *Hydnocera guatemalæ*, Gorh., pl. ix. fig. 3.

Tenerus flavicollis, and *Olesterus gracilis*, Gorham, figured by Waterhouse, Aid, ii. pls. cxxii. & cxxiii.

Blaxima, g. n. Gorham, Biol. Centr. Am. *Col.* iii. (2) p. 165. Allied to *Sallæa*, but resembling *Trichodes* in form; type, *Clerus rubripennis*, Chevr. (figured pl. viii. fig. 14).

New species:—

Tillus occidentalis, Gorham, Biol. Centr. Am. *Col.* iii. (2), p. 129, pl. ix. fig. 1, Mexico, Guatemala, Nicaragua.

Cymatodera grandis (Sturm, MS.), Mexico, p. 130, *championi*, fig. 12, Panama, p. 131, *parallela*, p. 132, *lunulata*, *angulifera*, Guatemala, p. 133, *nitida*, Mexico, Guatemala, *texana*, Texas, Mexico, *liturata*, Guatemala, p. 134, *bipunctata*, fig. 16, Mexico, *hægei*, Mexico, Guatemala, p. 135, *flexuosa*, Mexico, p. 136, *valida*, fig. 11, Guatemala, p. 137, *grossa*, Mexico, and *depauperata*, Guatemala, p. 138, *id. l. c.* pl. vii.

Priocera stictica, pl. vii. fig. 17, Mexico to Panama, and *clavipes*, Guatemala, Panama, *id. l. c.* p. 140.

Opilo clavatus, Chevrolat, Le Nat. ii. p. 133, Andaman Islands.

Colyphus ventralis, fig. 18, Mexico, Guatemala, p. 141, *telephoroides*, Guatemala, *floralis*, fig. 25, pl. vii. Chiriqui, p. 142, and *criocerides*, pl. viii. fig. 2, Mexico, p. 144, Gorham, *l. c.*

Aulicus monticola (Dugés, MS.), *id. l. c.* p. 146, pl. viii. fig. 18, Mexico.

Thanasimus (?) *subviolaceus*, id. *l. c.* p. 148, Costa Rica.

Clerus x-album, fig. 22, Guatemala, Honduras, Nicaragua, Panama, p. 151, *cautus*, Guatemala, *bicarinatus*, Nicaragua, Panama, *cinereus*, fig. 5, Guatemala, Panama, p. 152, *tubercularis*, fig. 20, Mexico, Guatemala, p. 153, *contractus*, fig. 13, Guatemala, *beatus*, fig. 23, Mexico, Guatemala, p. 154, *pictus*, fig. 7, Guatemala, *rutilus*, Mexico, p. 155, *opifex*, fig. 3, Mexico, Guatemala, Nicaragua, p. 156, *anceps*, *guatemalensis*, p. 157, *recurvatus*, fig. 17, Guatemala, p. 158, *hægei*, Mexico, p. 159, *æsopius*, fig. 8, Chontales, *insidiosus*, Panama, *cuneatus*, fig. 16, Mexico, p. 160,

and *inconstans* (figured as *nitidus*, figs. 9, 10 & 11), Guatemala, p. 163, *id. l. c.* pl. viii.

Trichodes turkestanicus, Samarcand, pp. 113 & 320, and *caucasicus*, Caucasus, p. 320, and note, Kraatz, Deutsche E. Z. xxvi.

Epiclines viri-diæneus, Gorham, *l. c.* p. 165, Guatemala.

Epiphlœus punctatus, Guatemala, and *erythrocephalus*, pl. viii. fig. 25, Mexico to Panama, *id. l. c.* p. 167.

Limexylonidæ.

Atractocerus luteolus, sp. n., Fairmaire, Notes Leyd. Mus. iv. p. 217, Sumatra.

Cupesidæ.

Cupes capitata, Fabr., noticed, Baynes-Reed, Rep. E. Soc. Ont. 1881, p. 31.

Ptinidæ.

Niptus fuscus, Gradl, probably = *griseo-fuscus*, De Geer; Reitter, Wien. ent. Zeit. i. p. 67. *N. hololeucus*, Fald., destructive to plate; [Lord] Walsingham, P. E. Soc. 1882, p. xxiii.

Cœlostethus, Cap., *nec* Leconte, renamed *Bangosternus*; Des Gozis, Rev. d'Ent. i. p. 203.

Amphibolus, Muls. (*nec* Klug), = *Claudius*, Des Gozis, = *Episernus*, Thoms.; Reitter, *l. c.* p. 167; Von Heyden, Bull. Soc. Ent. Fr. (6) ii. pp. cix. & cx. Des Gozis disputes the correctness of this synonymy; *op. cit.* pp. cxli. & cxlii.

Xyletinus ornatus, Fald., *nec* Germ., renamed *renovatus*; Des Gozis, Rev. d'Ent. i. p. 201. *X. discolor*, Fald., = *Ptilinus aspericollis*, Ménétr.; Reitter, *l. c.* p. 67.

Capnodes and *Xenocera*, Broun (pre-occupied), renamed by him *Methemus* and *Xenogonus* respectively; Ann. N. H. (5) ix. p. 409.

Mesanobium, g. n., Sharp, Tr. E. Soc. 1882, p. 85. Allied to *Dryophilus* and *Priobium*; type, *M. debile*, sp. n., *l. c.* p. 86, New Zealand.

Ernobius anabaptista, sp. n. (= *angusticollis*, Muls. & Rey, *nec* Ratz.), Des Gozis, Rev. d'Ent. i. p. 199.

Claudius achillis, sp. n., *id. l. c.* p. 201, Puy de Dôme.

Bostrychidæ.

Polycaon confertus, Lec. Habits; Riley, Am. Nat. xvi. p. 747.

Psoa blanchardi, Luc. Habits, &c., noticed; Perraudière, Bull. Soc. Ent. Fr. (6) ii. pp. lxi. & lxxii.

Apate. Several species noticed as destructive in Algeria; Girard, Bull. Soc. Ent. Fr. (6) ii. pp. xlviii. & xlix.

Sinoxylon senegalense, Karsch, redescribed; *S. zickeli*, Mars., belongs to *Apate*; *A. reichii*, Mars., and *hæmaticollis*, Fairm., are synonymous: Fairmaire, Ann. Soc. Ent. Fr. (6) ii. p. 66.

Dinoderus pusillus feeding on cork; Riley, *l. c.* p. 747.

Cioidæ.

Lyctus canaliculatus, Fabr., injurious to oak; Lampa, Ent. Tidskr. iii. pp. 3 & 97. *L. impressus*, Com., var. *capitalis*, Schauf., from Mallorca and Algeria, noticed; Schaufuss, Nunq. Ot. iii. p. 534.

Cis. Several European species noticed; Flach, Deutsche E. Z. xxvi. p. 251.

Cis reitteri, Aschaffenburg, and *gladiator*, Saxony, spp. nn., *id. l. c.* pp. 249 & 250.

Trictenotomidæ.

Trictenotoma childreni, var. *birmana*, from Burma, noticed; Dohrn, S. E. Z. xliii. p. 458.

Trictenotoma lansbergii, sp. n., *id. l. c.* xliii. p. 457, Nias.

Tenebrionidæ.

Desbrochers, Des Loges. Insectes Coléoptères du nord de l'Afrique nouveaux ou peu connus. Tenébrionides (Premier mémoire). Rôme: 8vo, pp. 120. (Extracted from Bull. Ac. Hipp. 1881.)

183 species noticed, many new, including some which are not African.

Kraatz, G. Beiträge zur Käferfauna von Turkestan. ii. Neue Tenebrioniden von Margelan. Deutsche E. Z. xxvi. pp. 81–95.

Chiefly consists of descriptions of new species.

Kraatz remarks, respecting some species described by Fischer as *Tenebrionidæ*, that *Gnathosia glabra* is a *Capnisa*; *Trigonoscelis echinata* is an *Ocnera*; *Pimelia tuberculata* = *cephalotes*, Pall.; *Diesia karelini* is rather doubtful; and *Platyscelis labialis* is probably a species of *Zabrus*.

Zophosides.

Zophosis lata, Margelan, and *persica*, N. Persia, spp. nn., Kraatz, Deutsche E. Z. xxvi. p. 94, and note.

Erodiides.

Leptonychus lævisternus, sp. n., Fairmaire, Bull. Soc. Ent. Fr. (6) ii. p. clxxviii., Tripoli.

Spyrathus africanus, sp. n., *id.* Révoil's Faune et Flore Çomal. *Col.* p. 62, Somali-land.

Adesmiides.

Adesmia. Species of Central Asia and Persia discussed; Kraatz, Deutsche E. Z. xxvi. pp. 105–108.

Adesmia lævicollis, sp. n., *id. l. c.* p. 107, Margelan.

Tentyriides.

Pachychila. Species tabulated, pp. 15–17. *P. impressifrons*, Sol., var. *subcylindrica*, Sol., and varr. nn. *continua*, *emarginata*, and *rugatipennis*, all from Algeria, noticed, pp. 10 & 11; Desbrochers, Bull. Ac. Hipp. 1881.

New genera and species :—

Pterophlæus, Desbrochers, Bull. Ac. Hipp. p. 4. Allied to *Tentyria* and *Pachychila*, base of elytra not ridged, joints of antennæ very long, tibiæ not triangularly dilated, and labrum visible ; type, *O. picipes*, sp. n., *l. c.* p. 5, Biskra.

Homæonota, Fairmaire, Révoil's Faune et Flore Çomal. *Col.* p. 63. Allied to *Rhytidonota*, body longer and less convex ; type, *H. subopaca*, sp. n., *l. c.*, Somali-land.

Cœnisa depressiuscula, Kraatz, Deutsche E. Z. xxvi. p. 81, Margelan.

Gnathosia sinuatocollis, crassicornis, Greece, p. 18, *caucasica*, Caucasus, p. 19, *minuscula*, Taurus (?), p. 20, and *humeralis*, Erzeroum, p. 21 ; Desbrochers, Bull. Ac. Hipp. 1881.

Anatolica balassogloi, Dohrn, S. E. Z. xliii. p. 245, Kara Kum, Turcomania.

Alcinoe spectabilis, Kraatz, *l. c.* p. 82, note, Turcomania.

Calyptopsis convexicollis, Desbrochers, *l. c.* p. 17, Georgia.

Pachychila grandis, p. 6, and var. *rugatula*, p. 7, *discedens*, Oran, *tazmaltensis* (Oliv., MS.), Tazmalt, p. 8, *reflexicargo*, p. 11, and *breviuscula*, Oran, p. 12, *id. l. c.*

Microdera margelanica and *heydeni*, Kraatz, *l. c.* pp. 81 & 82, Margelan.

Rhytidonota acuticollis and *gracillima* (? = *Mesostena gracillima*, Ancey), Fairmaire, CR. Ent. Belg. xxvi. p. xlix., Zanzibar ; *R. subcordicollis* and *delicatula*, id. Révoil's Faune et Flore Çomal. *Col.* pp. 64 & 66, Somali-land.

Oxycara zophosina, amplipennis, p. 65, and *trapezicollis*, p. 66, *id. l. c.*, Somali-land.

Epitragides.

Sphenaria brevicollis, sp. n., Solsky, Troudy Ent. Ross. xiii. p. 45, Kisil-Kum.

Stenosides.

Stenosis obliterata varr. *obsoleta* and *ferruginea* from Algeria noticed ; Desbrochers, Bull. Ac. Hipp. 1881, p. 23.

Dichillus crassicornis and *pertusus* differentiated ; *id. l. c.* p. 33.

Stenosis maxima, p. 22, *oblongicollis*, Algeria, p. 23, *tangeriana*, p. 24, *maroccana*, p. 25, Tangiers, *hipponensis*, Bône, p. 27, *parvicollis*, Algeria, p. 28, *foveiventris*, p. 29, *læviventris*, Crimea, p. 30, and *quadraticollis*, Turkey, p. 31, spp. nn., *id. l. c.*

Dichillus unistriatus, id. *l. c.* p. 32, Syria ; *D. seminitidus*, Solsky, Troudy Ent. Ross. xiii. p. 47, Samarcand ; *D. brunneus*, Kraatz, Deutsche E. Z. xxvi. p. 321, Samarcand : spp. nn.

Akisides.

Cyphogenia kraatzi, Baudi, varr. *brevicostata*, from Khojent, and *unicostata*, from Margelan, described ; Kraatz, Deutsche E. Z. xxvi. pp. 83 & 84.

Solskyia, g. n. (Ersch. MS.), Solsky, Troudy Ent. Ross. xiii. p. 48. New

section of *Akis*; allied to *Lechriomus* and *Cyphogenia*; type, *S. peregrina* (Ersch., MS.), sp. n., *l. c.* p. 49, Samarcand.

Scaurides.

Scaurus macricollis, Allard, Bull. Soc. Ent. Fr. (6) ii. p. lxxxvii., Mesopotamia, Egypt; *S. breviatus*, La Calle, p. 33, *lucidulus*, Algeria, p. 34, and *sublævis*, Tangiers, p. 36, Desbrochers, Bull. Ac. Hipp. 1881: spp. nn.

Blaptides.

ALLARD, E. Essai de Classification des Blapsides de l'Ancien Monde. 4e et dernière partie. Ann. Soc. Ent. Fr. (6) ii. pp. 77–140, figs. 84–135.

A table of species is appended.

Prosodes lucida, Ball., redescribed; Kraatz, Deutsche E. Z. xxvi. p. 324.

New species:—

Blaps longicornis, id. *l. c.* pp. 95 & 326, Margelan, Samarcand; *B. brunnea*, Allard, Ann. Soc. Ent. Fr. (6) ii. p. 89, fig. 93, Himalaya.

Leptocolena emoda, Himalaya, fig. 123, p. 128, and *foveicollis*, Himalaya, p. 132, *id. l. c.*

Agroblaps amurensis, Manchuria, fig. 108, p. 109, *mœrens*, East Indies, fig. 117, p. 119, and *bipunctata*, fig. 102, Ekaterinost, p. 127, *id.* l. c.; *A. akinina*, id. *l. c.* p. 135, S. E. Z. xliii. p. 388, Turkistan.

Blapisa caraboides, id. *ll. cc.* pp. 135 & 389, Turkistan.

Stalagmoptera heydeni, p. 326, *incostata*, *tuberculosa*, p. 327, and varr. ? *intermedia* and *modesta*, *S. dubia*, *striata*, p. 328, and *mollis*, p. 329, Kraatz, *l. c.*, Samarcand.

Dineria puella, Allard, Ann. Soc. Ent. Fr. (6) ii. p. 102, fig. 102, Kurdistan.

Prosodes parallelocollis, Margelan, p. 95, *parumpunctata*, p. 321, *undulata*, *obliquesulcata*, p. 322, *diloides*, p. 323, *heydeni*, p. 324, *pygmæa*, p. 325, and *minima*, Samarcand, p. 326, Kraatz, *l. c.*

Asidides.

Asida lorcana and *clementii*, Perez, noticed; Kraatz, Deutsche E. Z. xxvi. pp. 46 & 47.

Asida moraguezi, sp. n., Schaufuss, Nunq. Ot. iii. p. 534, Balearic Islands.

Pimeliides.

Ocnera hispida, var. *græca* described; Desbrochers, Bull. Ac. Hipp. 1881, p. 41.

Centrocnemis, g. n., Kraatz, Deutsche E. Z. xxvi. p. 330. Allied to *Lasiostola*, but thorax much more distinctly contracted behind, and elytra longer; type, *C. mollis*, sp. n., *l. c.*, Samarcand.

New species:—

Trigonoscelis contraria and *sinuatocollis*, Desbrochers, Bull. Ac. Hipp.

1881, pp. 43 & 45, S. Russia; *T. lævinscula*, p. 87, *planiuscula*, p. 88, *submuricata*, p. 95, Kraatz, Deutsche E. Z. xxvi., Margelan.

Lasiostola affinis (Ballion, MS.), *simillima*, *carinata*, p. 89, *laticollis*, Margelan, p. 90, and *granulata*, Ala-Tau, p. 91, *piligera*, Samarcand, p. 331, *id. l. c.*

Ocnera piceola, Biskra, p. 38, *longicollis*, Cairo, p. 39, and *beckeri*, locality not stated, p. 42, Desbrochers, *l. c.*; *O. longicollis*, Solsky, Troudy Ent. Ross. xiii. p. 51, Shahrud.

Thriptera striato-granosa, Fairmaire, Révoil's Faune et Flore Çomal. *Col.* p. 67, Somali-land; *T. ballionis*, Kraatz, *l. c.* p. 87, Margelan.

Pachyscelis major and *nitidula*, id. *l. c.* p. 86, Margelan; *P. piochardi*, Desbrochers, *l. c.* p. 47, Lebanon.

Pimelia cristata, Kurdistan, p. xxx., *doumeti*, Tunis, *inexspectata*, p. xxxi., *indica*, p. lvi., *convexicollis*, East Indies, and *raffrayi*, Massowa, p. lvii., Sénac, Bull. Soc. Ent. Fr. (6) ii.; *P. cenchronota*, Fairmaire, *l. c.* p. 68, Somali-land; *P. sudanica*, id. Ann. Soc. Ent. Fr. (6) ii. p. 66, Soudan, Bogos; *P. pachyscelis* and *simulatrix*, Margelan, p. 85, and *spectabilis*, Samarcand, p. 329, Kraatz, *l. c.*

Leucolaphus latifrons, Fairmaire, Le Nat. ii. p. 48, Abyssinia.

Molyrides.

Sepidium variegatum, Fabr., varr. *laterale*, All., *dufouri*, Sol., and varr. nn. *subfurcatum*, *integrum*, and *dispar*, and *S. barbarum*, Sol. (?) all from Algeria, described; Desbrochers, Bull. Ac. Hipp. 1881, pp. 50–53. *S. crassicaudatum*, Gestro, redescribed, Fairmaire, Révoil's Faune et Flore Çomal. *Col.* p. 72.

New genera and species:—

Melanolophus, Fairmaire, Révoil's Faune et Flore Çomal. *Col.* p. 69. Allied to *Distretus*; elytra very convex and multicarinate, hinder angles of thorax obtuse; legs equal; front femora not thickened; scutellum large. Type, *M. septem-costatus*, sp. n., *l. c.* p. 70, pl. i. fig. 7, Somali-land.

Brachyphrynus, id. *l. c.* p. 71. Allied to *Phrynocolus*, but more massive, with no prominences on the thorax or elytra; type, *B. spissicornis*, sp. n., *l. c.* p. 72, Somali-land.

Physophrynus, id. CR. Ent. Belg. xxvi. p. l. Allied to *Phrynocolus*, thorax and elytra more globular, without ridges or projections, epipleural fold large and channelled, especially near the extremity of the elytra; prosternum subtruncated, with an obtuse projection. Type, *P. burdoi*, sp. n., *l. c.*, Zanzibar.

Psammodes vage-costatus, Fairmaire, CR. Ent. Belg. xxvi. p. l., Zanzibar. *P. gracilentus*, id. Révoil's Faune et Flore Çomal. *Col.* p. 69, Somali-land.

Sepidium obtusangulum, p. 73, *villosulum*, p. 74, *apicicorne*, and *cylindrigerum*, p. 75, id. *l. c.*, Somali-land; *S. brevicaudatum*, id. CR. Ent. Belg. xxvi. p. li., Zanzibar; *S. capricorne*, Desbrochers, Bull. Ac. Hipp. 1881, p. 48, Algeria (?).

Vieta crinita, Nyassa, and *crosa*, Abyssinia, Allard, Bull. Soc. Ent. Fr. (6) ii. p. lxxxvii.; *V. tuberosa*, Fairmaire, Révoil's Faune et Flore Çomal. *Col.* p. 76, Somali-land.

Cryptizus murinus, Allard, *l. c.* p. lxxxvii., Egypt; *C. fairmairii*, Algeria, p. 53, *olivieri*, Bône, p. 55, *substriatus*, S. Russia, p. 118, Desbrochers, *l. c.*

Pedinides.

Cabirus. Table of species, mostly new; Desbrochers, Bull. Ac. Hipp. 1881, pp. 57–60. The known and new species are then described, *l. c.* pp. 60–68.

New genera and species :—

Platynoscelis, Kraatz, Deutsche E. Z. xxvi. p. 91. Allied to *Platyscelis*; types, *P. helopioides* and *lucidicollis*, spp. nn., *l. c.* p. 92, Margelan.

Faustia, id. *l. c.* p. 92. Allied to *Platyscelis*; type, *F. modesta*, sp. n., *l. c.* p. 93, Margelan.

Somocelia, id. *l. c.* p. 331. Allied to *Platyscelis*; type, *S. pinguis*, sp. n., *l. c.* p. 332, Samarcand.

Platyscelis margelanica, Kraatz, Deutsche E. Z. xxvi. p. 84, Margelan.

Pandarus libanicus, Desbrochers, Bull. Ac. Hipp. 1881, p. 68, Lebanon.

Cabirus pubescens, Syria, p. 60, *ampliatus*, Damascus, *libanicus*, Lebanon, p. 61, *strictulus*, Nazareth, *convexiusculus*, p. 62, *latiusculus*, Syria, *nitidulus*, p. 63, *rectangulus*, Nazareth, and *vicinus*, Syria, p. 64, *id. l. c.*

Isocerus balearicus, Schaufuss, Nunq. Ot. iii. p. 535, Balearic Islands.

Heterophylus ellipticus, Desbrochers, *l. c.* p. 72, S. Russia.

Opatrides.

Opatrum sculpturatum, Fairm., is a true *Opatrum*, quite distinct from *Hadrus europæus*, Motsch., which probably = *O. colliardi*, Fairm., = *Sinorus ciliaris*, Muls.; *id. l. c.* pp. 77 & 78.

Apostethus, g. n., Pascoe, Ann. N. H. (5) ix. p. 27. Allied to *Opatrum*; labrum prominent; prosternum forked; metasternum very short. Type, *A. terrenus*, sp. n., *l. c.* p. 28, Queensland.

New species :—

Scleron denticolle, Fairmaire, Notes Leyd. Mus. iv. p. 219, Sumatra.

Opatrum (*Gonocephalum*) *acutangulum* and *O.* (*G.*) *mustelinum*, id. *l. c.* pp. 220 & 221, Sumatra.

Halonomus cribricollis, Abyssinia, and *schneideri*, Cairo, Allard, Bull. Soc. Ent. Fr. (6) ii. p. lxxxvi.

Melambius breviusculus, Desbrochers, Bull. Ac. Hipp. 1881, p. 69, Oran.

Micrositus serripes, id. *l. c.* p. 71, Oran.

Penthicus granulatus, S. Russia, and *asiaticus*, Asia Minor, *id. l. c.* pp. 73 & 74.

Hadrus verrucatus, Madeira, and *subellipticus*, Crete, *id. l. c.* p. 76.

Trachyscelides.

Anemia pilosa, Tourn., noticed; Desbrochers, Bull. Ac. Hipp. 1881, p. 79.

Proscheimus, g. n., *id. ibid.* Facies of *Anemia*, but more closely related to the *Diaperides*; type, *P. arabicus*, sp. n., *l. c.* p. 80, Arabia Petræa.

Anemia rotundicollis, id. *l. c.* p. 78, S. Italy; *A. fausti*, Solsky, Troudy

Ent. Ross. xiii. p. 52, Kisil-Kum; *A. opacula*, Fairmaire, Le Nat. ii. p. 191, Abyssinia: spp. nn.

Bradymerus crenulicollis, sp. n., *id.* Notes Leyd. Mus. iv. p. 221, Sumatra.

Bolitophagides.

Ulomida picta, Mén., Fald., = *Alphitophagus quadripustulatus*, Steph.; Reitter, Wien. ent. Z. i. p. 67.

Scaphidema armeniaca[*-cum*], sp. n., Desbrochers, Bull. Ac. Hipp. 1881, p. 81, Erivan.

Platydema laticornis[*-ne*], sp. n., Fairmaire, Notes Leyd. Mus. iv. p. 222, Sumatra.

Ceropria ovulum, Fairmaire, Le Nat. ii. p. 192, Abyssinia; *C. impressifrons*, id. Notes Leyd. Mus. iv. p. 222, Sumatra: spp. nn.

Hemicera compacta, sp. n., *id. l. c.* p. 244, Sumatra.

Ulomides.

Achthosus antimachoides and *furcicollis*, Fairmaire, Notes Leyd. Mus. iv. pp. 223 & 224, Sumatra, spp. nn.

Uloma picicornis, p. 224, *lævifrons*, *denticornis*, p. 225, *rufilabris*, and *[illegible]tracta*, p. 226, *id. l. c.*, Sumatra; *U.* (?) *fastidiosa*, id. CR. Ent. Belg. xxvi. p. li., Zanzibar: spp. nn.

Toxicum sumatrense and *distinctum*, spp. nn., *id.* Notes Leyd. Mus. iv. p. 227, Sumatra.

Tenebrionides.

Tenebrio molitor. Anatomy of larva (*cf.* FRENZEL, J., *Insecta*, General Subject, *anteà*, p. 4); *T. opacus*, Duft., probably = *obscurus*, Fabr., var.; Schaufuss, Bull. Soc. Ent. Fr. (6) ii. p. lxxxv.

New genera and species:—

Homæogenus, Waterhouse, Ann. N. H. (5) ix. p. 174. Allied to *Taraxides* and *Amenophis*; type, *H. laticorne*, sp. n., *l. c.* (cf. also Fairmaire, Notes Leyd. Mus. iv. p. 232), Sumatra.

Oxænimorphus, Fairmaire, Le Nat. iv. p. 127. Allied to *Tenebrio*, penultimate joints of antennæ not transverse, eyes less indented, thorax narrower than elytra, &c.; type, *O. costulipennis*, sp. n., *l. c.*, Nossi Bé.

Necrobioides, id. Notes Leyd. Mus. iv. p. 234. Placed after *Encyalesthus*; type, *N. cæruleatus*, sp. n., *l. c.* p. 235, Sumatra.

Cryptobates, id. *l. c.* p. 231. *Helopides*?, but tip of antennæ not compressed; type, *C. rubiginea*, sp. n., *l. c.* p. 232, Sumatra.

Nyctobates æreipennis, *semisulcata*, p. 228, *podagra*, p. 229, *granifera*, and *coracina*, p. 230, *id. l. c.*

Encyalesthus viriditinctus, id. *l. c.* p. 234, Sumatra.

Derosphærus alutaceus, id. *l. c.* p. 235, Sumatra.

Tenebrio medius, Desbrochers, Bull. Ac. Hipp. 1881, p. 83, Bône.

Dilamus tangerianus, id. *l. c.* p. 84, Tangiers.

Heterotarsides.

Phymatodes variabilis var. *dimidiatipennis*, from Russia, described; Chevrolat, Ann. Soc. Ent. Fr. (6) ii. p. 58.

Pseudolyprops, g. n., Fairmaire, Notes Leyd. Mus. iv. p. 236. Allied to *Lyprops*, eyes larger, more convex, and touching the front edge of the prothorax; type, *P. dilaticollis*, sp. n., *l. c.* p. 237, Sumatra.

Lyprops picinus, id. *ibid.*, Sumatra.

Pycnocerides.

Pycnocerus cyanescens, Fairmaire, CR. Ent. Belg. xxvi. p. lii., Zanzibar.

Cyphaleides.

Artactes corruscus, sp. n., Fairmaire, Notes Leyd. Mus. iv. p. 237, Sumatra.

Cnodalides.

Eucyrtus anthracinus, Kraatz, noticed; Fairmaire, Notes Leyd. Mus. iv. p. 278.

Gauromaia dives, Pascoe, redescribed; *id. l. c.* p. 240.

New genera and species :—

Calydonis, Pascoe, Ann. N. H. (5) ix. p. 31. Allied to *Camaria*, clypeus short, not marked off from the head, terminal joints of the antennæ transverse, elytra not striated; types, *C. refulgens* and *cuprea*, spp. nn., Lower Amazons.

Immedia, id. *l. c.* p. 33. Allied to *Cyriosoma*; type, *I. occulta*, sp. n., *l. c.*, Bahia.

Exapinæus, id. *l. c.* p. 34. Allied to *Tetraphyllus* (?); type, *E. politus*, sp. n., *l. c.*, Upper Amazons.

Alcyonotus, id. *l. c.* p. 35. Allied to *Camarimena*; type, *A. iridescens*, sp. n., *l. c.*, Cape Coast Castle.

Eucyrtus (*Platycrepis*) *latitarsis*, and *interstitialis*, Fairmaire, Notes Leyd. Mus. iv. p. 239, Sumatra.

Gauromaia viridi-ianthina, *alternata*, p. 241, and *hasselti*, p. 242, *id. l. c.*, Sumatra.

Tetraphyllus iodochalceus and *orichalceus*, id. *l. c.* pp. 242 & 243, Sumatra.

Camarimena armipes, id. *l. c.* p. 244, Sumatra.

Camaria chlorizans, *clandestina*, and *decipiens*, Pascoe, *l. c.* p. 30, Santarem.

Helopides.

Amarantha, Motsch., = *Melasia*, Muls.; Reitter, Wien. ent. Z. i. p. 167.

Helops splendidulus and *villosus*, Schauf., belong to *Catomus*, All.; Schaufuss, Bull. Soc. Ent. Fr. (6) ii. p. lxxxv.

New genera and species :—

Helopimorphus, Desbrochers, Bull. Ac. Hipp. 1881, p. 92. Intermediate between *Cistelidæ* and *Helopidæ*; type, *H. angulipennis*, sp. n., *l. c.* p. 93, Bône.

Telethrus, Pascoe, Ann. N. H. (5) ix. p. 29. Allied to *Misolampus*; type, *T. ebeninus*, sp. n., *l. c.*, Santarem.

Diopethes, id. *l. c.* p. 32. Distinguished from *Spharotus* by its narrow intercoxal process and short tarsi; type, *D. arachnoides*, sp. n., *l. c.* p. 33, Bahia.

Espites (Bates, MS.), *id. l. c.* Allied to *Chariotheca*, mesosternum sloping, tarsi short and stout, clypeus narrower; type, *E. basalis*, sp. n., *l. c.*, New Guinea.

Periphanes, Fairmaire, Notes Leyd. Mus. iv. p. 245. Allied to *Hegemona* and *Elosda*; type, *P. orichalceus*, sp. n., *l. c.* p. 246, Sumatra.

Blepegenes equestris, Pascoe, Ann. N. H. (5) ix. p. 28, New South Wales.

Læna cureipes, Desbrochers, Bull. Ac. Hipp. 1881, p. 86, Cyprus; *L. hirtella*, Kokand, and *dilutella*, Urgut, Solsky, Troudy Ent. Ross. xiii. pp. 54 & 55.

Thesilea rugifrons, Fairmaire, Notes Leyd. Mus. iv. p. 238, Sumatra.

Helops chlorsi, Kraatz, Deutsche E. Z. xxvi. p. 47, Andalusia; *H.* (*Nalassus*) *alpigradus*, Monte Viso, and *H. angulicollis*, Varna, Fairmaire, Bull. Soc. Ent. Fr. (6) ii. pp. clxix. & clxx.

Hedyphanes (?) *niger*, Kraatz, *l. c.* p. 332, Samarcand.

Stenomax lucidicollis and *lævicollis*, id. *l. c.* p. 333, Samarcand.

Helopinides.

Micrantereus assimilis, Ancey, Le Nat. ii. p. 54, Uzagara; *M. tentyrioides*, Pascoe, Ann. N. H. (5) ix. p. 29, Yemen; *M. fimbritibius*, id. Le Nat. ii. p. 68, Abyssinia; *M. luteo-pubens*, id. CR. Ent. Belg. xxvi. p. lii., Zanzibar; *M. sinuatipes* and *recticostatus*, id. Révoil's Faune et Flore Çomal. *Col.* pp. 78 & 79, Somali-land, spp. nn.

Helopinus minor, sp. n., *id. l. c.* p. 77, Somali-land.

Megacanthides.

Hoplonyx subopacus, sp. n., Fairmaire, Le Nat. ii. p. 192, Abyssinia.

Synopticus quadricollis and *myrmido*, id. *l. c.* p. 68, Abyssinia; *S. dapsoides*, id. Notes Leyd. Mus. iv. p. 246, Sumatra: spp. nn.

Amarygmides.

Eulytus, g. n., Waterhouse, Ann. N. H. (5) ix. p. 175. Allied to *Eupezus*; type, *E. nodipennis*, sp. n., *l. c.*, E. Africa; *id.* Aid, ii. pl. cix.

Rygmodus puncticeps, Broun, N. Z. J. Sci i. p. 287, New Zealand.

Amarygmus irideus, p. 247, *multicolor*, and *hasselti*, p. 248, Fairmaire, Notes Leyd. Mus. iv., Sumatra, spp. nn.

Dietysus ovoideus, p. 249, *longicrus*, *picitarsis*, p. 250, and *oblongulus*, p. 251, *id. l. c.*, Sumatra, spp. nn.

Strongyliides.

Strongylium sudanicum, Fairmaire, Ann. Soc. Ent. Fr. (6) ii. p. 67, Soudan; *S. cariosicolle*, *ianthinipes*, p. 252, and *flavitarse*, p. 253, *id.* Notes Leyd. Mus. iv., Sumatra; *S. latericostatum*, Karsch, B. E. Z. xxvi. p. 387, Colombo: spp. nn.

Cælolophus ritsemæ, sp. n., Fairmaire, *l. c.* p. 254, Sumatra.

Praogena cribricollis and *cyaneocastanea*, spp. nn., *id.* Révoil's Faune et Flore Çomal. *Col.* p. 80, Somali-land.

Cistelidæ.

Hymenorus rufipes and *obscurus* are myrmecophilous; Pergande & Riley, Am. Nat. xvi. p. 748.

Gonodera (*Eubœus*) *viridis*, Allard, = *pulcherrima*, Fald.; Reitter, Wien. ent. Z. i. p. 67.

Mycetocharis croceipes, Weise, ? = *gracilis*, Fald.; *id. l. c.* p. 67.

Omophlus (*Heliotaurus*) *distinctus* var. *varicentris*, and several other known Algerian species noticed; Desbrochers, Bull. Ac. Hipp. 1881, pp. 88–91. *O. menticornis*, Reitt., appears to be distinct from *cæruleus*; Reitter, *l. c.* p. 167.

Cisteloida, g. n., Fairmaire, Notes Leyd. Mus. iv. p. 256. Allied to *Cistela* and *Allecula*; type, *C. castanescens*, sp. n., *l. c.*, Sumatra.

New species :—

Allecula crassipes, Fairmaire, Notes Leyd. Mus. iv. p. 254, Sumatra.

Cistela (*Cteniopus*) *pygialis*, and *C.* (*C.*) *melanocera*, id. *l. c.* p. 255, Sumatra.

Podonta hirtipennis, Solsky, Troudy Ent. Ross. xii. p. 251, Kisil-Kum; Sarafschan; *P. tenuis*, Kraatz, Deutsche E. Z. xxvi. p. 114, Margelan.

Omophlus corvus, Sarafschan, and *subtilis*, Kisil-Kum, Solsky, *l. c.* pp. 253 & 255; *O.* (*Heliotaurus*) *crassicornis*, Batna, p. 87, *O.* (*H.*) *analis*, Algeria, p. 89, and *O.* (*H.*) *maculicollis*, Portugal, p. 90, Desbrochers, Bull. Ac. Hipp. 1881.

Prostenus militaris, p. 35, *iocerus*, *parilis*, *nitens*, Amazons, p. 36, and *lugubris*, Monte Video, p. 37, Pascoe, Ann. N. H. (5) ix.

Nilionidæ.

Hades rufo-limbatus, sp. n., Fairmaire, Notes Leyd. Mus. iv. p. 257, Sumatra.

Melandryidæ.

Melandrya caraboides, L. Pupa described; Beling, Wien. ent. Z. i. pp. 257 & 258.

Lagriidæ.

Lagria gigas, Cast., redescribed; Fairmaire, Notes Leyd. Mus. iv. p. 258. *L. hirta* var. (?) *lineata*, from Algeria described; Desbrochers, Bull. Ac. Hipp. 1881, p. 94.

Casnonidea, g. n., Fairmaire, Notes Leyd. Mus. iv. p. 264. Differs from other *Lagriidæ* by its large head, its eyes not emarginate, and touching the prothorax. Types, *C. holomelæna* and *atriceps*, spp. nn., *l. c.* pp. 264 & 265, Sumatra.

Lagria brevipilis, Algeria, and *rugata* [Algeria?], Desbrochers, Bull. Ac. Hipp. 1881, pp. 95 & 97. *L. cineracea*, p. 258, *hemichlora*, *rufo-fusca*, p. 259, *diffusa*, p. 260, *gibbula*, *lemoides*, p. 261, and *crenato-striata*, p. 262, Fairmaire, Notes Leyd. Mus. iv. Sumatra: spp. nn.

Nemostira uncipennis and *truncata*, spp. nn., *id. l. c.* pp. 262 & 263, Sumatra.

Pedilidæ.

Macratria linella, Java, p. 55, *soricina*, Aru, and *bicincta*, Luzon, p. 56, Marseul, Tijdschr. Ent. xxv.; also Notes Leyd. Mus. iv. pp. 113–115: spp. nn.

Xylophilus filicornis and var. *bicolor*, Schaufuss, Nunq. Ot. iii. p. 536, Balearic Islands; *X. angulithorax* and *pallens*, Desbrochers, Bull. Ac. Hipp. 1881, pp. 98 & 99, Bône; *X. fasciolatus*, Marseul, *ll. cc.* pp. 54 & 112, Batavia: spp. nn.

Anthicidæ.

List of North African species of *Anthicidæ*; Desbrochers, Bull. Ac. Hipp. 1881, pp. 100–118. The following synonymic notes occur:—*Notoxus appendicinus*, *Formicomus brevipilis*, *sareptanus* (? = *nobilis*, Fald.), *uncinatus*, *Leptaleus truncatipennis*, *Anthicus lividipes* and *truquii*, Desbrochers, are quite distinct from the species to which Marseul has referred them; *A. femoralis*, Mars., name pre-occupied in the genus; *A. longipennis*, Desbr., = *crinitus*, Laf., var.; *luteipes*, Mars., = *morio*, var.; *saulcii*, Mars., = *femoralis*, var. *triangulum*, Desbr.; *versicolor*, Kies., = *tibialis*, Waltl, and *phœnicius*, Truq., = *ineditus*, Laf.

Notoxus signipennis and *ruricola*, Boh., are probably identical; Dohrn, S. E. Z. xliii. p. 482.

Anthicus quadrimaculatus, Luc. (*nec* Guér.), must take the name of *brunneus*, Laferté, and *femoralis*, Mars. (*nec* Desbr.), is renamed *magistri*; Des Gozis, Rev. d'Ent. i. pp. 202 & 203. *A. tæniatus*, Baudi, referred first to *cinctulus*, and then to *digitalis*, Mars.; Reitter, Wien. ent. Z. i pp. 67 & 168.

Tomoderus ehlersi, Von Heyden, Deutsche E. Z. xxvi. p. 47, Andalusia; *T. fusicornis*, Marseul, Tijdschr. Ent. xxv. p. 57, and Notes Leyd. Mus. iv. p. 116, Sumatra: spp. nn.

Mecynotarsus bisetiger, Sumatra, and *oblique-maculatus* (Laferté, MS.), East Indies; *id. ll. cc.* pp. 58 & 59, note, and p. 117 and note: spp. nn.

Anthicus sericornis, Sumatra, p. 59, *cruciellus*, Java, p. 60, *subrubrocinctus*, Sumatra, p. 61, *javanus*, Batavia, p. 62, *bizonellus*, Java, and *bataviensis*, Batavia, p. 63, *id.* Tijdschr. Ent. xxv.; also Notes Leyd. Mus. iv. pp. 118–123: spp. nn.

Mordellidæ.

Smith, J. B. A Synopsis of the *Mordellidæ* of the United States. Tr. Am. Ent. Soc. x. pp. 73–100, pls. i.–iii.

Genera recharacterized, and species tabulated; *Glipodes*, Lec., is hardly distinct from *Mordellistena*, Costa. Two subordinate groups are differentiated: *Anaspini* (*Diclidia*, Lec., *Pentaria*, Muls., and *Anaspis*, Geoffr.), and *Mordellini* (*Tomoxia*, Costa, *Mordella*, L., *Glipodes*, Lec., and *Mordellistena*, Costa).

Tomoxia muriniceps, sp. n., Chevrolat, Bull. Soc. Ent. Fr. (6) ii. p. cii., Colombia.

Glipa quadrifasciata and *nigro-signata*, spp. nn., *id. l. c.* p. cii., Brazil.

Mordellistena elegantulus, fig. 21, Long Island, p. 90, *atriceps*, United States, *picipennis*, New York, Georgia, p. 91, *pallipes*, fig. 26, New York, p. 92, *indistincta*, fig. 32, New York, *inornata*, fig. 33, Texas, *minuta*, fig. 35, pl. ii. p. 93, *ferruginoides*, Georgia, p. 94, *splendens*, fig. 5, Illinois, Florida, *floridensis*, Florida, p. 95, *singularis*, fig. 11, Georgia, *schaupi*, fig. 13, New York, *æqualis*, fig. 14, United States, p. 96, *rufescens*, fig. 23, Nevada, p. 97, *cinereo-fasciata*, figs. 24 & 25, New York, *æthiops*, Colorado, and *texana*, fig. 64, pl. iii., Texas, p. 98, J. B. Smith, Tr. Am. Ent. Soc. x.

Anaspis abollata, Des Gozis, Rev. d'Ent. i. p. 201, Basses-Alpes; *A. militaris*, J. B. Smith, *l. c.* p. 77, pl. i. fig. 21 (elytron), United States.

Pentaria hirsuta, id. *l. c.* p. 76, pl. i. fig. 13 (elytron), United States.

Rhipidophoridæ.

Rhipidophorus paradoxus, Linn., noticed; De Buysson, Feuill. Nat. x. p. 133. Varieties noticed; Gradl, Ent. Nachr. viii. pp. 323–326.

Rhipidophorus pallescens, sp. n., Solsky, Troudy Ent. Ross. xiii. p. 57, Dschisak.

Stylopidæ.

Brandt, E. On the Nervous System of the *Strepsiptera*. Ann. N. H. (3) ix. pp. 456 & 457, fig.

Abstract of a Russian paper published in 1878. The cephalic division of the nervous system consists of the supraæsophageal ganglion only, the infraæsophageal ganglion being absent; the thoracic division consists of a large ganglion containing five pairs of nuclei; it is divided into two portions, the first of which is the smallest, and the abdominal division also consists of one ganglion only.

Notes on *Strepsiptera* and *Andrenidæ*; Brandt, Troudy Ent. Ross. xiii. pp. v. & vi.; (*cf.* also Sagemehl, SB. Ges. Dorpat, vi. pp. 399 & 400).

Cantharidæ.

Magretti, P. Del prodotto di secrezione particolare in alcuni Meloidi. Boll. Scient. iii. pp. 23–27, figs.

Chemico-microscopical investigations.

Remarks on the larvæ of the *Meloidæ*; Lichtenstein, Nouv. et faits, ii. pp. 159 & 160.

Muñoz's notes on *Cantharidæ* (cf. Zool. Rec. xviii. *Ins.* p. 74) abstracted; Fauvel, Rev. d'Ent. i. pp. 131–138.

Mylabris frolovi (Gebl.), Germ., noticed; Dohrn, S. E. Z. xliii. p. 372.

Lytta vittata, *marginata*, *atrata*, and *cinerea*, habits, etc., noticed; Claypole, Rep. E. Soc. Ont. 1881, pp. 31 & 32.

Œnas afer, common in S. Spain, likely to prove a useful vesicant; Amengue, Brit. Med. Journ., quoted in Psyche, iii. p. 360.

Zonitis bipunctata, Chevr., *nec* Rag., renamed *chevrolati*; Ragusa, Nat. Sicil. i. p. 281; but Abeille notes it as = his *Zonitides oculifer*, Bull. Soc. Ent. Fr. (6) ii. p. cxxv.

Lydomorphus, g. n., Fairmaire, Révoil's Faune et Flore Çomal. *Col.* p. 85. Differs from *Lydus* and *Cantharis* by the large approximating eyes; type, *L. cinnamomeus*, sp. n., *l. c.* p. 86, Somali-land.

New species :—

Meloe xanthomelas, Solsky, Troudy Ent. Ross. xii. p. 257, Samarcand; *M. curticollis*, Margelan. p. 117, *sulcicollis* and *pygmæus*, Samarcand, p. 334, Kraatz, Deutsche E. Z. xxvi.

Diaphorocera semirufa, Fairmaire, Révoil's Faune et Flore Çomal. *Col.* p. 82, Somali-land.

Mylabris argyrosticta, id. *l. c.* p. 81, Somali-land.

Cantharis exclamans, *pectoralis*, and *testaceipes*, id. *l. c.* pp. 83–85, Somali-land; *C. pilosella*, Solsky, *l. c.* p. 259, Tashkend; *C. luteo-vittata*, Kraatz, *l. c.* p. 334, Samarcand; *C. crassicornis*, Costa, Atti Acc. Nap. ix. (1) p. 35, Calabria.

Zonitis bi-impressa, Valladolid, and *bipunctata* (Dej. Cat.), Damascus, Chevrolat, Bull. Soc. Ent. Fr. (6) ii. pp. iv. & v.; *Z. abyssinica*, Fairmaire, Le Nat. ii. p. 68, Abyssinia.

Hapalus apicalis, Kraatz, *l. c.* p. 335, Samarcand.

Œdemeridæ.

Nacerdes italica, Chevr., noticed; Lentz, Ent. Nachr. viii. pp. 100 & 101.

Oncomera femorata, Fabr., var. *purpureo-cærulea*, from Dalmatia, described; Ganglbauer, Wien. ent. Z. i. p. 137.

Œdemera quadrinervosa, Reiche, = *Opsimea ventralis*, Mill., ♀; *id. l. c.*

Techmessa distans, sp. n., Sharp, Tr. E. Soc. 1882, p. 87, New Zealand.

Curculionidæ.

Faust, J. Rüsselkäfer aus dem Amurgebiet. Deutsche E. Z. xxvi. pp. 257–295.

Includes a list of known species, notes, and descriptions of many new species. 80 species belonging to 32 genera were known to Motschulsky in 1860; at present, upwards of 180 species are known, belonging to 61 genera. The species have mostly European affinities, and exhibit comparatively few North American affinities.

Undetermined larva (of a weevil?) in ash; Fitch, P. E. Soc. 1882, p. viii.

Nanophyes, *Apion*, *Orobitis*, *Rhytidoderes*, and *Alophus*. Structure noticed; Bedel, Bull. Soc. Ent. Fr. (6) ii. pp. clvi. & clvii.

Strophosoma bauduери, Desbr., = *curvipes*, Thoms.; *Polydrosus variegatus* and *subglaber*, Desbr, are varieties of one species; *Sitones maurita-*

nicus, Fabr., = *ambulans*, Gyll., *Phytonomus opimus*, Lec., = *punctatus*, Fabr., *Gonocleonus multicostatus*, Chevr., = *Stephanocleonus muniert*, Bedel, *Cleonus exanthematicus*, Fairm., = *lejeunii*, Fairm., *C. ocularis*, Fabr., = *barbarus*, Oliv., *Lixus lateralis*, Bris., = *ascanii*, L., var., *Hypomolyx pinicola*, Lec., = *Hylobius pineti*, Fabr.; Bedel, Bull. Soc. Ent. Fr. (6) ii. pp. clxxi.-clxxiii.

Brachyderides.

Pseudocneorrhinus obesus, Roelofs, noticed; Faust, Deutsche E. Z. xxvi. p. 263.

Cneorrhinus and *Catapionus*. Structure of ♀ noticed; *id. l. c.* p. 264.

Sitones lineatus, fig. 1, and *punctipennis* noticed; Ormerod, J. R. Agric. Soc. (2) xviii. pp. 599–601; P. E. Soc. 1882, pp. xii. & xiv.–xvi.; Hart, Ent. xv. pp. 193–196. *S. regensteinensis*, Linn., noticed; De Buysson, Feuill. Nat. ii. p. 44. Ravages of various species of *Sitones*, etc.; Fairmaire, Bull. Soc. Ent. Fr. (6) ii. pp. lxxviii.-lxxx.

Polydrosus. Monograph of French species; Des Gozis, Rev. d'Ent. i. pp. 97–112, 121–128, & 145–153. *P. sibiricus*, Hochh., characters noticed; Faust, *l. c.* p. 262.

Amomphus virescens, Boh. Structure described; *id. l. c.* pp. 264 & 265.

Polycleis cinereus, Fabr., = *plumbeus*, Guér.; *P. maculatus*, Boh., noticed; the genera *Polycleis* and *Hypomeces* are perhaps identical: Dohrn, S. E. Z. xliii. pp. 363–366.

Pachyrrhynchus. These beetles frequent guavas in Luzon, and some species mimic spiders; Van Volxem, Gard. Chron. (2) xvi. [1881] pp. 135 & 136.

Ophryastes (?) *globosus*, Motsch., belongs to *Blosyrus*. Structure and variation noticed; Faust, Hor. Ent. Ross. xvi. pp. 285 & 286.

New genera and species :—

Molybdotus, Fairmaire, Révoil's Faune et Flore Çomal. *Col.* p. 88. Allied to *Thylacites*, rostrum rather longer and more square, antennæ thicker, thorax and elytra ridged at the base, &c.; type, *M. laxe-punctatus*, sp. n., *l. c.*, Somali-land.

Tanycnemus, Faust, Hor. Ent. Ross. xvi. p. 291. Allied to *Geonemus*; type, *T. akinini*, sp. n., *l. c.* p. 294, Orenburg.

Blosyrus ventricosus, Ancey, Le Nat. ii. p. 54, Uzagara, E. Africa; *B. superciliosus*, Chevrolat, Le Nat. ii. p. 93, Andaman Islands; *B. falcatus*, Faust, Deutsche E. Z. xxvi. p. 262, Amur.

Sciaphilus albilaterus and *hispidus*, id. S. E. Z. xliii. pp. 431 & 432, Minusinsk.

Mesagroicus angustirostris, id. Deutsche E. Z. xxvi. p. 263, Amur.

Sitones amurensis, id. *l. c.* p. 263, Amur; *S. obscuratus*, id. S. E. Z. xliii. p. 430, Irkutsk, Minusinsk.

Polydrosus dohrni, id. *l. c.* p. 431, Krasnovodsk, Tashkend; *P. obesulus*, id. Deutsche E. Z. xxvi. p. 261, Amur.

Thylacites gracilipes, Krasnovodsk, p. 286, *glaucus*, Persia, *verrucicollis*, Astrabad, p. 288, *mongolicus*, Baikal, Dauria, Amur, p. 290, *id.* Hor. Ent.

Ross. xvi. ; *T. rugosus*, Deichmüller, Verh. L.-C. Ak. xlii. p. 311, pl. xxi. figs. 6 & 6*a*, Kutschlin (fossil).

Piazomias schœnherri, Faust, *l. c.* p. 296, Amur ; *P. humilis*, id. Deutsche E. Z. xxvi. p. 264, Amur.

Capanopachys insularis, id. Hor. Ent. Ross. xvi. p. 297, Island of Saghalien.

Polyclcis nobilitatus and *despectus*, Ancey, *l. c.* pp. 78 & 79 ; *P. octoplagiatus* and *albido-pictus*, Fairmaire, Révoil's Faune et Flore Çomal. *Col.* pp. 89 & 90, Somali-land ; *P. raffrayi*, id. Le Nat. ii. p. 48, Abyssinia ; *P. krokisi*, Dohrn, S. E. Z. xliii. p. 365, Guinea.

Dermatodes chrysochlorus, Ritsema, Notes Leyd. Mus. iv. p. 177, Sumatra.

Otiorrhynchides.

On *Otiorrhynchidæ* injurious to cultivated plants ; Riley, Am. Nat. xvi. pp. 915 & 916.

Otiorrhynchus. Ravages of various species ; Fairmaire, Bull. Soc. Ent. Fr. (6) ii. pp. lxxviii.–lxxx. *O. septentrionis*, Herbst, var. *eccheli* from Tirol, described, Gredler, Z. Ferd. (3) xxvi. p. 230. *O. sulcatus*, Fabr. : ravages ; Künckel d'Herculais, Bull. Soc. Ent. Fr. (6) ii. pp. lviii. & lix.

Meira caucasica, Stierl., = *Platytarsus cruciatus*, Stierl. ; Reitter, Wien. ent. Z. i. p. 67.

Ptochus strigirostris and *variegata*, Hochh., are sexes ; Fauvel, Hor. Ent. Ross. xvi. pp. 293 & 294.

Cathormiocerus cordicollis, Seidl., = *viridiscapus* ; Rouget, Bull. Soc. Ent. Fr. (6) ii. pp. cxliv. & cxlv.

Elytrodon bidentatum, Stev., noticed, and ♀ described ; Retowski, Wien. ent. Z. i. p. 69.

Epiphaneus malachiticus, Boh., and *anatolicus* differentiated ; Schaufuss, Bull. Soc. Ent. Fr. (6) ii. p. lxxxv.

New genera and species :—

Epilaris, Pascoe, Ann. N. H. (5) x. p. 444. Allied to *Platyomicus* ; type, *E. concinna*, sp. n., *l. c.* p. 444, pl. xviii. fig. 1, Labuan.

Bradycinetus, Schaufuss, Nunq. Ot. iii. p. 539. Allied to *Cathormiocerus*, *Trachyphlœus*, and *Rhytidorrhinus* ; type, *B. ignatii*, sp. n., *l. c.* p. 540, Balearic Islands.

Platyr[r]hynchus, Chevrolat, Le Nat. ii. p. 94. Placed after *Myllocerus* ; type, *P. bicarinatus*, sp. n., *l. c.*, Andaman Islands.

Otiorrhynchus raffrayi, *phœostictus*, and *brachyderoides*, Fairmaire, Le Nat. ii. p. 192, Abyssinia ; *O. tatarchani* and *subcoriaceus*, Reitter, Wien. ent. Z. i. p. 222, Caucasus ; *O. dobrutschæ* and *parvulus*, Stierlin, MT. schw. ent. Ges. vi. pp. 250 & 251, Turkey ; *O.* (*Eurychirus*) *simplex*, Altai, and *O.* (*E.*) *streblowi*, Krasnojarsk, *id.* Hor. Ent. Ross. xvi. pp. 150 & 152.

Otiorrhynchites constans, Fritsch, Beitr. Pal. Österr.-Ung. ii. p. 5, pl. ii. fig. 2 (fossil).

Troglorrhynchus myops, Reitter, *l. c.* p. 31, Caucasus.

Systates abyssinicus, Fairmaire, *l. c.* p. 192, Abyssinia; *S. moniliatus*, id. Révoil's Faune et Flore Çomal. *Col.* p. 87, Somali-land; *S. nigro-granatus* and *granaticollis*, id. CR. ent. Belg. xxvi. pp. lii. & liii.

Episomus gracilicornis, Ritsema, Notes Leyd. Mus. iv. p. 178, Sumatra; *E. figuratus*, Karsch, B. E. Z. xxvi. p. 387, Colombo.

Bryocheta palliata, Pascoe, Ann. N. H. (5) x. p. 444, pl. xviii. fig. 3, West Africa.

Peritelus tennicornis, Schaufuss, Nunq. Ot. iii. p. 539, Mallorca.

Meira grouvellii Stierlin, MT. schw. ent. Ges. vi. p. 255, Mentone; *M. sedilloti*, Brisout, Bull. Soc. Ent. Fr. (6) ii. p. clxxix., Ardèche.

Ptochus impressicollis, Faust, Hor. Ent. Ross. xvi. p. 300, Minusinsk, Krasnojarsk.

Phyllobius profanus, id. *l. c.* p. 302, Minusinsk; *P. mariæ*, id. S. E. Z. xliii. p. 430, Samara; *P. sanctus*, id. Deutsche E. Z. xxvi. p. 260, Ussuri; *P. roboretanus*, Gredler, Z. Ferd. (3) xxvi. p. 231, Tyrol.

Mylloceras lateralis and *multicostatus*, Chevrolat, *l. c.* pp. 93 & 94, Andaman Islands; *M. fumosus*, Faust, Deutsche E. Z. xxvi. p. 261, Japan.

Ptochidius tessellatus (Motsch., MS.), *piriformis*, and *intelligens*, id. *l. c.* pp. 265–267, Amur.

Eremiides.

Platytrachelus marmoratus, Kirghis Steppes, Turkistan, and *exquisitus*, Krasnovodsk, Faust, Hor. Ent. Ross. xvi. pp. 303 & 305, spp. nn.

Leptopides.

Tropi[do]phorus, Schönh. European species tabulated and discussed; *T. mercurialis*, Stierl., = *lepidotus*, Herbst, = *obtusus*, Bonsd., and *T. abbreviatus*, Stierl., = *mercurialis*, Fabr., = *elevatus*, Herbst: Kraatz, Deutsche E. Z. xxvi. pp. 53–55. *T. cæsius*, Stierl. & Friv., are identical; Reitter, Wien. ent. Z. i. p. 67.

Lipothyrea, g. n., Pascoe, Ann. N. H. (5) ix. p. 375. Allied to *Scotasmus*; type, *L. chloris*, sp. n., *ibid.*, Port Bowen.

Pephricus rattulus, sp. n., Pascoe, Ann. N. H. (5) ix. p. 374, Richmond River.

Leptops crassicornis, p. 375, *acutispinis*, Queensland, *furfuracea*, p. 376, *glauca*, New South Wales, and *puellaris*, Queensland, p. 377, *id. l. c.*, spp. nn.

Deracanthus solskii, sp. n., Faust, Hor. Ent. Ross. xvi. p. 306, Kasalinsk.

Brachycerides.

Brachycerus barbarus, Linn., var. *modestus*, from the Balearic Islands, described; Schaufuss, Nunq. Ot. iii. p. 542. *B. tuberculosus*, Gyll., var. from Guinea noticed; Dohrn, S. E. Z. xliii. p. 251.

Brachycerus maculipes and *raffrayi*, Chevrolat, CR. Ent. Belg. xxvi. pp. lxxxix. & xc., Abyssinia; *B. phrynopterus*, Fairmaire, CR. Ent. Belg. xxvi. p. liii., Zanzibar: spp. nn.

Byrsopides.

Perieges hardus, Boh. Structure described; it is allied to *Synthocus*: Faust, Hor. Ent. Ross xvi. p. 309.

Rhytidorrhinus modestus, sp. n., Schaufuss, Nunq Ot. iii. p. 543, Mallorca, Palma.

Gronops vestitus, id. *l. c.* p. 554, Abyssinia.

Amycterides.

Bubaris, g. n., Pascoe, Ann. N. H. (5) ix. p. 378. Allied to *Ædriodes* and *Mythites*; type, *B. indemnis*, sp. n., *ibid.*, Mackenzie River, Australia.

Amorphorrhinus arcanus, sp. n, *id. l. c.* p. 379, Swan River.

Cylindrorrhinides.

Anagotus, g. n., Sharp, Tr. E. Soc. 1882, p. 90. An aberrant form, which may be placed at present near *Inophlœus*. Type, *A. helmsi*, sp. n., *ibid.*, New Zealand.

Molytides.

Molytes coronatus. Habits and transformations; Fallou, Bull. Soc. Ent. Fr. (6) ii. pp. lxxiii. & lxxiv.

Anisorrhynchus deletus, sp. n., Deichmüller, Verh. L.-C. Ak. xlii. p. 313, pl. xxi. fig. 7, Kutschlin (fossil).

Plinthus (?) *jugifer*, sp. n., Schaufuss, Nunq. Ot. iii. p. 555, Nepal.

Tanyrrhynchides.

Trachodes heydeni, sp. n., Stierlin, MT. schw. ent. Ges. vi. p. 254, Croatia.

Gonipterides.

Oxyops niveo-sparsa, sp. n., Pascoe, Ann. N. H. (5) ix. p. 379, Queensland.

Hyperides.

Alophus rudis, Boh., and *albo-notatus*, Motsch. Variation, structure, &c., described; Faust, Deutsche E. Z. xxvi. pp. 267 & 268.

Phytonomus punctatus, Fabr. Transformations and habits described; Riley, Rep. Ins. 1882, pp. 171–179, pl. x. fig. 1. *P. opimus*, Mels., is the same species; *id.* Am. Nat. xvi. pp. 248 & 249, and Leconte, Tr. Am. Ent. Soc. ix. p. xxxvi.

Eurychirus, Stierl., *nec* Waterh., renamed *Arammichnus*; Des Gozis, Rev. d'Ent. i. p. 203.

New species:—

Alophus lituratus, Ala Tau, *quadrifasciatus*, Jergetale, and *vittatus*, Ala Tau; Faust, Hor. Ent. Ross. xvi. pp. 309–311.

Cepurus capiomonti, id. Deutsche E. Z. xxvi. p. 268, Amur.

Hypera (*Phytonomus*) *miselia*, id. *l. c.* p. 269, Vladivostok.

Phelypera copaifera, Lucas, Bull. Soc. Ent. Fr. (6) ii. p. clxx., interior of Brazil.

Eurychirus (*Otiorrhynchus*) *valdemosæ* and *miramaræ*, Schaufuss, Nunq. Ot. iii. pp. 537 & 538, Balearic Islands.

Diabathrariides.

Geophilus and *Pachyodon*, Broun (pre-occupied), renamed by him *Geochus* and *Phorostichus* respectively; N. Z. J. Sci. i. p. 128, and Ann. N. H. (5) ix. p. 409.

Atelicus abruptus, Tasmania, and *crassipes*, Western Australia; Pascoe, Ann. N. H. (5) ix. pp. 379 & 380: spp. nn.

Cleonides.

Neocleonus dealbatus, Fabr., var. (?) from Abyssinia noticed; Chevrolat, CR. Ent. Belg. xxvi. p. xc.

Cleonus torpescus, Schönh., belongs to *Pleurocleonus*, Motsch., and has nothing to do with *C. variegatus*, Motsch.; Faust, Deutsche E. Z. xxvi. p. 270.

Larinus and *Lixus*. List of species, with notices of early stages and food-plants; Bargagli, Bull. Ent. Ital. xiv. pp. 312–319.

Lixus defloratus, Oliv., noticed; Dohrn, S. E. Z. xliii. pp. 462 & 463.

Mecaspis setulicollis, *plicaticollis*, and *fuliginosa*, Quedenfeldt, B. E. Z. xxvi. pp. 326–328, Angola, spp. nn.

Larinus mœstus, sp. n., Chevrolat, CR. Ent. Belg. xxvi. p. xc., Abyssinia.

Hylobiides.

Lepyrus nebulosus, Motsch., var. *motschulskii*, and *L. arcticus*, Payk., varr. *costulatus*, *4-notatus* (Boh.), *ventricosus*, *gibbus*, and *volgensis*, from various parts of Russia and Siberia noticed; *L. japonicus*, Roelofs, perhaps = *geminatus*, Say; Faust, Deutsche E. Z. xxvi. pp. 270–273.

Hylobius gebleri, Boh., *japonicus*, Har. (? = *sedakovi*, Hochh.), and *pinastri*, Gyll., noticed; *id. l. c.* pp. 274 & 275. *H. abietis* noticed; Clément, Bull. Soc. Ent. Fr. (6) ii. p. cxviii.: injurious to vines; Girard, *op. cit.* pp. xciv. & xcv.

Orthorrhinus klugi injurious to vines in Australia; Macleay, P. Linn. Soc. N. S. W. vii. pp. 329, 330, & 344–347, and N. Z. J. Sci. i. p. 273.

Carcilia strigicollis, Roel. Faust refers this genus to the *Hylobiini*, between *Pœpalesomus* and *Pissodes*; Deutsche E. Z. xxvi. p. 275.

Chitonopterus, g. n., Fairmaire, Révoil's Faune et Flore Çomal. *Col.* p. 91. Allied to *Paramecops*, elytra attenuated at base, thorax not granulose, but covered with points, &c.; type, *C. cryptor*[r]*hynchinus*, sp. n., *l. c.* p. 92, Somali-land.

New species:—

Lepyrus asperatus, Schaufuss, Nunq. Ot. iii. p. 554, Moldavia; *L. christophi* and var. *notabilis*, Faust, Deutsche E. Z. xxvi. p. 272, Amur.

Hylobius haroldi and *longulus*, id. *l. c.* pp. 273 & 274, Amur.

Orthorrhinus aspredo, Queensland, p. 380, *carbonarius*, New South

Wales, *lateralis*, Lord Howe Island, p. 381, and *posticus*, Queensland, p. 382, Pascoe, Ann. N. H. (5) ix.

Erirrhinides.

Sharpia, Tourn., recharacterized and the species discussed; Faust, Hor. Ent. Ross. xvi. pp. 314–316.

Mecinus collaris, Germ. Variation noticed; Bignell, Ent. xv. p. 238.

Lissorhoptrus simplex, Say. Transformations described and figured; Riley, Rep. Ins. 1882, pp. 130–133, pl. vi. fig. 4.

New genera and species:—

Lixodes, Pascoe, Ann. N. H. (5) x. p. 445. Allied to *Peliobia*; type, *L. taeniatus*, sp. n., *l. c.* pl. xviii. fig. 8, Monte Video.

Bagoopsis, Faust, Hor. Ent. Ross. xvi. p. 317. Differs from *Erirrhinus* and *Icaris* by the antennal fossæ converging, but not meeting towards the base of the proboscis. Types, *B. volgensis*, Astracan, Samara, and *pugnax*, Taganrog, spp. nn., *l. c.* pp. 319 & 321.

Procas biguttatus, Faust, Deutsche E. Z. xxvi. p. 275, Amur and Vladivostok.

Grypidius mannerheimi, id. Hor. Ent. Ross. xvi. p. 312, Siberia, Amur.

Sharpia inconspecta, id. *l. c.* p. 313, Krasnovodsk.

Nemestra vibrata, Pascoe, Ann. N. H. (5) ix. p. 382, Swan River.

Aoplocnemis guttigera, Victoria (?), and *suturalis*, Melbourne, *id. l. c.* p. 383.

Erirrhinus merkli, Stierlin, MT. schw. ent. Ges. vi. p. 252, S. Hungary.

Smicronyx albo-pictus, Faust, *l. c.* p. 316, Kirghis Steppes.

Ambalides.

Drepanambates, g. n., Jekel, Ann. Ent. Belg. xxvi. p. 85. Differs from *Ambates* by the robust falciform rostrum. To include *Ambates perspicillum*, *modestus*, Kirsch, *marcli*, Germ., *griseolus*, Er., &c., *Peridinetus schœnherri*, Chevr. (*infrà*), and *D. amabilis*, sp. n., *l. c.*, Rio de Janeiro.

Apionides.

Apion. List of Sicilian species; Ragusa, Nat. Sicil. i. pp. 254 & 280. *A. ragusæ* and *viridicæruleum*, Everts, redescribed and figured; *op. cit.* p. 253, pl. xi. figs. 2 & 3. *A. miniatum* noticed; Rashetin, Troudy Ent. Ross. xiii. p. x.

Apion sarothamni, Gradl, Ent. Nachr. viii. p. 331, Germany; *A. murinum*, Everts, Nat. Sicil. i. p. 252, pl. xi. fig. 1, Sicily: spp. nn.

Attelabides.

Attelabus cyaneus, Boh. Variation of Siberian specimens; *A. carbonicolor*, Motsch., *erythræus*, Gmel., *coryli*, Linn., and *latipennis*, Jek. (= *flavimanus*, Motsch.), discussed; Faust, Deutsche E. Z. xxxi. pp. 291–295.

Attelabus giganteus, sp. n., *id. l. c.* p. 291, Amur.

Apoderus (*Cycnotrachelus*) *coloratus*, Amur, p. 292, *rubidus* (Motsch., MS.), Amur, &c., p. 294, and *A. miniatus*, East Indies, p. 295, note, *id. l. c.*, spp. nn.

Rhinomacerides.

Schmidt-Göbel, H. M. (*Rhynchites alni*, Müll., *betuleti*, Fabr.), [illegible]n Leben und Treiben und seine Vertilgung. Wien: 1882, 8vo, pp. 74.

Rhynchites unicolor, Roel., noticed; Faust, Deutsche E. Z. xxvi. p. 284.

Byctiscus populi, Linn., var. *nigripes*, from Ussuri, and *tauricus*, from Kasan, noticed; *congener*, Jek., redescribed; and *cicatricosus*, Motsch, noticed: *id. l. c.* pp. 289–291.

Rhino[r]rhynchus, g. n., Sharp, Tr. E. Soc. 1882, p. 88. Allied to *Nemonyx*; type, *R. zealandicus*, sp. n., *l. c.* p. 89, New Zealand.

Rhynchites hirticollis, Amur, p. 283, *lævior*, Dauria, &c., p. 284, *pæcatus*, Vladivostok, Amur, *amurensis*, Amur, p. 285, *socius*, Darjiling, p. 286, note, *proximus*, *depressus*, Amur, p. 287, *argutus*, Darjiling, p. 288, note, and *dybofskii*, Ussuri, p 289, Faust, Deutsche E. Z. xxvi.; *R. longe-hirtus*, Fairmaire, Ann. Soc. Ent. Fr. (6) ii. p. 67, N. India: spp. nn.

Auletes puberulus, Faust, *l. c.* p. 283, Amur; *A. rubro-rufus*, Solsky, Troudy Ent. Ross. xii. p. 261, Sarafschan: spp. nn.

Nem[at]onyx canescens, sp. n., *id. l. c.* p. 263, Kisil-Kum, &c.

Scolopterides.

Scolopterus submetallicus, sp. n., Colenso, Tr. N. Z. Inst. xiv. p. 281, New Zealand.

Otidocephalides.

Magdalinus carbonarius, Linn., *asphaltinus*, Boh., and *stygius*, Gyll., differentiated; Habelmann, B. E. Z. xxvi. pp. 391–394.

Magdalis tridentata, Gradl, = *carbonaria*, Linn.; Kraatz, Deutsche E. Z. xxvi. p. 156.

Magdalis weisii, sp n., Schreiner, Deutsche E. Z. xxvi. p. 159, Germany.

Balaninides.

Ergania, sp. n., Pascoe, Ann. N. H. (5) x. p. 445. Allied to *Balaninus*; type, *E. gibba*, sp. n., *l. c.* p. 446, Java.

Balaninus conjugalis, Amur, and *B.* (*Balanobius*) *clavatus*, Japan, Faust, Deutsche E. Z. xxvi. p. 278, and note; *B. geinitzi*, Deichmüller, Verh. L.-C. Ak. xlii. p. 314, pl. xxi. figs. 5 & 5 *a*, Kutschlin (fossil): spp. nn.

Anthonomides.

Anthonomus pyri, Koll., attacking fruit-buds; Girard, Bull. Soc. Ent. Fr. (6) ii. p. lxxxviii. *A. pomorum* noticed and figured; Ormerod, J. R. Agric. Soc. (2) xviii. p. 603.

Orchestes mutabilis, Schönh. Variety from Dauria and Ussuri noticed; Faust, Deutsche E. Z. xxvi. p. 282. *O. populi*: ravages in Sweden; Aurivillius, Ent. Tidskr. iii. p. 30. *O. quercus*, Linn., var. *phœbus* from Savoy, &c., noticed; Des Gozis, Rev. d'Ent. i. p. 206.

Toplithus, g. n., Des Gozis, Rev. d'Ent. i. p. 203. Section of *Anthonomus*, scutellum small, not granulated, densely pubescent; femora unarmed, or with a simple tooth. To include all the species of *Anthonomus*, auctt., except *druparum*, Linn. (= *rectirostris*, Linn.); add *A.* (*T.*) *rosinæ*, sp. n., *l. c.* p. 204, France.

Anthonomus curtus, sp. n., Faust, S. E. Z. xliii. p. 432, Minsk.

Orchestes amplithorax, Amur, p. 279, *similis*, *sub-bifasciatus*, Amur, &c., p. 280, *fasciculatus*, Ussuri, p. 281, and *O.* (*Tachyerges*) *dauricus*, Dauria, and Nertschinsk, p. 281, note, *id.* Deutsche E. Z. xxvi.

Coryssomerides.

Lamyrus odiosus, sp. n., Faust, Deutsche E. Z. xxvi. p. 276, Amur.

Tychiides.

Pachytychius lucasi, Jekel, noticed; Ragusa, Nat. Sicil. i. p. 251.

Elleschus infirmus, Herbst, var. *languidus* (Schönh., MS.), from Amur, described; Faust, Deutsche E. Z. xxvi. p. 279.

Sibynes suturellus and *Tychius fasciatus*, Motsch., belong to *Sibynes*, and the former = *S. kiesenwetteri*, Tourn.; Faust, Hor. Ent. Ross. xvi. p. 316, note.

Tychius convolvuli, Krasnovodsk, and *sulphureus*, Turkistan, *id. l. c.* pp. 324 & 325, spp. nn.

Cionides.

Cionus merkli, sp. n., Stierlin, MT. schw. ent. Ges. vi p. 253, Turkey.

Nanophyes melanocephalus, sp. n., Baudi, Bull. Ent. Ital. xiv. p 378, Italy (not described).

Gymnetrides.

Gymnetron villosulum, Gyll. Galls on *Veronica amaryllis* noticed; Anderson, Ent. xv. p. 233.

Alcidides.

Alcides convexus, Oliv., noticed; Dohrn, S. E. Z. xliii. pp. 464 & 465.

Acœrus, g. n., Pascoe, Ann. N. H. (5) x. p. 451, note. Allied to *Alcides*; type, *A. frontalis*, Pasc.

Alcides mustela, *divergens*, Singapore, Sarawak, p. 446, *bisignatus*, Bouru, *indigaceus*, Mysol, p. 447, *parilis*, Saylee, *distigma*, Ceram, *amœnus*, Batchian, Saylee, *bellus*, Batchian, p. 448, *kirschi*, Labuan, pl. xviii. fig. 2, *dædalus*, Tondano, p. 449, *monilifer*, Ceylon, and *crassus*, Andaman Islands, p. 450, *id. l. c.*: spp. nn.

Nerthopides.

Acicnemis maculicornis, Fairm., = *maculicollis*, Chevr.; Chevrolat, Bull. Soc. Ent. Fr. (6) ii. p. v.

Menemachus stigma, sp. n, Pascoe, Ann. N. H. (5) x. p. 451, pl xviii. fig. 4, Angola.

Acicnemis longus, sp. n., Chevrolat, Le Nat. ii. p. 133, Andaman Islands.

Cholides.

Cholus philoctetes, Colombia, p. xxxi., *repetitus*, *lebasi*, New Granada, *patruelis*, Para, *lecipes*, Cayenne, p. xxxii., and *C.* (?) *longirostris*, Brazil, p. xxxiii., Chevrolat, CR. Ent. Belg. xxvi., spp. nn.

Cryptorrhynchides.

Mecocorynus intricatus and *fahræi*, Boh., discussed; Dohrn, S. E. Z. xliii. pp. 468–470.

Conotrachelus nenuphar destructive to cherry and apple; Claypole, Canad. Ent. xiv. p. 17, and Rep. E. Soc. Ont. 1881, p. 32.

Desmidophorus penicillatus, Dej., MS., = *Rhynchænus fascicularis*, Oliv.; Dohrn, *l. c.* p. 371.

Indecentia and *Pachypeza*, Broun (pre-occupied), renamed by him *Incentia* and *Dermothrius* respectively; Ann. N. H. (5) ix. p. 409.

New genera and species:—

Aryptæus, Pascoe, Ann. N. H. (5) x. p. 451. Allied to *Mecocorynus*; to include *A. suturalis*, pl. xviii. fig. 6, Sarawak, *pustulosus*, Cambodia, p. 452, *trinarius*, Dorey, Sarawak, and *galeotes*, Sarawak, p. 453, spp. nn.

Elytrocoptus, Chevrolat, Ann. Soc. Ent. Fr. (6) ii. p. 50. To include *Cryptorrhynchus lirinus*, *lemniscatus*, *strangulatus*, and *ephippiatus*, Boh., and *ornatipennis*, p. 50, *ephippium* (Dej., MS.), Brazil, *cognatus*, p. 51, *tricolor*, *consanguineus*, Cayenne, and *dispilus* (Jekel, MS.), Goyas, p. 52: spp. nn.

Cylindrothecus, id. *l. c.* p. 53. To include *Cryptorrhynchus perforatus*, *per-insignis*, *porosus*, *infractus*, *cavernosus*, *nudirostris*, *sticticus*, *cylindraceus*, *cristatus*, *posticus*, *conicollis*, *lacunicollis*, and *porifer*, Boh., and *C. candidulus*, Brazil, and *pistrinarius*, locality not stated, spp. nn., *l. c.* p. 54.

Blabor[r]hinus, id. *l. c.* p. 55. Allied to last; types, *Cryptorrhynchus bistrigirostris*, Boh., and *læsirostris*, sp. n., *l. c.*, Brazil.

Atrichis, id. *l. c.* p. 55. Type, *Cœlosternus delumbis*, Germ.; add *A. geniculatus*, Brazil, p. 55, *quadrisignatus*, Colombia, and *albitarsus*, Mexico, p. 56: spp. nn.

Ectatorrhinus frontalis, Chevrolat, Le Nat. ii. p. 133, Andaman Islands.

Desmidophorus 12-fasciculatus, id. *l. c.* p. 133, Andaman Islands; *D. calatus*, Karsch, B. E. Z. xxvi. p. 388, Colombo.

Chalcodermus kirschi, Deichmüller, Verh. L.-C. Ak. xlii. p. 316, pl. xxi. figs. 9–11, Kutschlin (fossil).

Mecistocerus cristatus, *nigro-punctatus*, *nigro-striatus*, *geniculis-albis*, Chevrolat, *l. c.* p. 134, Andaman Islands.

Camptorrhinus hystrix, Fairmaire, Réveil's Faune et Flore Çomal. *Col.* p. 93, Somali-land.

Pachyonyx perelegans, id. *l. c.* p. 92, Somali land.

Rhynchodes weberi and *rubipunctatus*, Coleuso, Tr. N. Z. Inst. xiv. pp. 281 & 282, New Zealand.

Gasterocercus quinque-punctatus and *anatinus*, Chevrolat, *l. c.* p. 94, Andaman Islands.

Zygopides.

Zygops (?) *balsameni*, Motsch., belongs to *Eurycommatus*; Faust, Deutsche E. Z. xxvi. p. 276, note.

Tyriotes, g. n., Pascoe, Ann. N. H. (5) x. p. 454. Allied to *Sphadasmus*; type, *T. cuneipennis*, sp. n., *l. c.* pl. xviii. fig. 7, Cameroons.

Sphadasmus semicostatus, sp. n., Fairmaire, Le Nat. ii. p. 192, Abyssinia.

Ceuthorrhynchides.

Cnemodes geranii, Payk., abnormal specimen noticed; Des Gozis, Rev. d'Ent. i. p. 205.

Ceuthorrhynchus chlorophanus, Rouget, noted as omitted in recent catalogues; Bedel, Bull. Soc. Ent. Fr. (6) ii. p. exliv.

Diacritus, g. n., Pascoe, Ann. N. H. (5) x. p. 454. Allied to *Ceuthorrhynchus*; type, *D. pinguis*, sp. n., *l. c.* p. 455, pl. xviii. fig. 9*a*, and 9*l*, (details), Tamatave.

Hypurus, g. n., Rey, Rev. d'Ent. i. p. 187. Allied to *Rhinoncus*; type, *Ceuthorrhynchus bertrandi*, Perris (redescribed, *l. c.* p. 189).

Poophagus robustus, Taganrog, and *araneipes*, Orenburg; Faust, Hor. Ent. Ross. xvi. pp. 322 & 323: spp. nn.

Peridinetides.

Peridinetus, Schönh. Catalogued, and the number of species raised to 21; Chevrolat, Ann. Ent. Belg. xxvi. pp. 79–83. Additional observations by Jekel; *l. c.* pp. 84–86.

Peridinetus sanguinolentus, Cayenne (*cf.* Jekel, p. 84), p. 79, *maculiventris*, Amazons, *schœnherri*, Brazil, *lineicollis*, New Granada, p. 80, *bicruciatus*, *frontalis* (cf. Jekel, p. 85), Colombia, p. 81, *luctuosus*, Nicaragua, *suturalis*, Para, p. 82 (*cf.* Jekel, p. 86), *jelskii* (Jekel, MS., = *maculiventris*, suprà, *cf.* Jekel, p. 84), Peru, *cinctus* (also *cf.* Pascoe, 1880; *cf.* Jekel, p. 86), Venezuela, and *posticus* (cf. Jekel, p. 86), Colombia, p. 83; Chevrolat, *l. c.* pp. 79–83: spp. nn.

Baridiides.

Baris. Faust remarks on the following species described by Hochhuth:—*B. schwartzenbergi* = *convexicollis*, Schönh., *B. landgrebii* = *atricolor*, Schönh., *B. gimmerthali* = *semistriatus*, Schönh.; *B. renardi* = *melanus*, Schönh., *B. spitzii*, probably = *artemisiæ*, ♀, and *B. suffriani* seems to be a good species; S. E. Z. xliii. pp. 433–436. *B. sulcipennis*, Bris., is not European, but = the Mexican *puncticollis*, Schönh.: Von Heyden, Deutsche E. Z. xxvi. p. 255.

Lissotarsus, g. n., Faust, Hor. Ent. Ross. xvi. p. 327. Allied to *Baris*, body densely scaled, tarsi simple, joints 2 and 3 of equal breadth. Types, *L. balasogloi*, p. 328, *signifer*, Turkistan, p. 330, *annularis*, Krasnovodsk, p. 331, and *capucinus*, Astracan, p. 332, spp. nn.

Melaleucus, g. n., Chevrolat, CR. Ent. Belg. xxvi. p. xc. Allied to *Baridius*; type, *M. littera*, sp. n., *l. c.* p. xci., Abyssinia; add *B. sellatus*, Boh.

Baris brisouti, sp. n., *id.* S. E. Z. xliii. p. 433, Derbent.

Calandrides.

Chevrolat, A. Calandrides: Nouveaux genres et nouvelles espèces, observations, synonymies, doubles emplois de noms des genres et d'espèces. 1ère partie. Ann. Soc. Ent. Fr. (6) ii. pp. 554–582.

The following synonyms, &c., occur:—*Cyrtotrachelus dux*, var. *rex* noticed; *C. buqueti*, Guér., is distinct, and = *bispinus*, Chevr.; *C. longimanus*, Fabr., var. from Cambodia noticed; *Otidognathus quadrimaculatus*,

Ceuthorrhynchides.

Cnemodes geranii, Payk., abnormal specimen noticed; Des Gozis, Rev. d'Ent. i. p. 205.

Ceuthorrhynchus chlorophanus, Rouget, noted as omitted in recent catalogues; Bedel, Bull. Soc. Ent. Fr. (6) ii. p. exliv.

Diacritus, g. n., Pascoe, Ann. N. H. (5) x. p. 454. Allied to *Ceuthorrhynchus*; type, *D. pinguis*, sp. n., *l. c.* p. 455, pl. xviii. fig. 9*a*, and 9*l*, (details), Tamatave.

Hypurus, g. n., Rey, Rev. d'Ent. i. p. 187. Allied to *Rhinoncus*; type, *Ceuthorrhynchus bertrandi*, Perris (redescribed, *l. c.* p. 189).

Poophagus robustus, Taganrog, and *araneipes*, Orenburg; Faust, Hor. Ent. Ross. xvi. pp. 322 & 323: spp. nn.

Peridinetides.

Peridinetus, Schönh. Catalogued, and the number of species raised to 21; Chevrolat, Ann. Ent. Belg. xxvi. pp. 79–83. Additional observations by Jekel; *l. c.* pp. 84–86.

Peridinetus sanguinolentus, Cayenne (*cf.* Jekel, p. 84), p. 79, *maculiventris*, Amazons, *schœnherri*, Brazil, *lineicollis*, New Granada, p. 80, *bicruciatus*, *frontalis* (cf. Jekel, p. 85), Colombia, p. 81, *luctuosus*, Nicaragua, *suturalis*, Para, p. 82 (*cf.* Jekel, p. 86), *jelskii* (Jekel, MS., = *maculiventris*, suprà, *cf.* Jekel, p. 84), Peru, *cinctus* (also *cf.* Pascoe, 1880; *cf.* Jekel, p. 86), Venezuela, and *posticus* (cf. Jekel, p. 86), Colombia, p. 83; Chevrolat, *l. c.* pp. 79–83: spp. nn.

Baridiides.

Baris. Faust remarks on the following species described by Hochhuth:—*B. schwartzenbergi* = *convexicollis*, Schönh., *B. landgrebii* = *atricolor*, Schönh., *B. gimmerthali* = *semistriatus*, Schönh.; *B. renardi* = *melanus*, Schönh., *B. spitzii*, probably = *artemisiæ*, ♀, and *B. suffriani* seems to be a good species; S. E. Z. xliii. pp. 433–436. *B. sulcipennis*, Bris., is not European, but = the Mexican *puncticollis*, Schönh.: Von Heyden, Deutsche E. Z. xxvi. p. 255.

Lissotarsus, g. n., Faust, Hor. Ent. Ross. xvi. p. 327. Allied to *Baris*, body densely scaled, tarsi simple, joints 2 and 3 of equal breadth. Types, *L. balasogloi*, p. 328, *signifer*, Turkistan, p. 330, *annularis*, Krasnovodsk, p. 331, and *capucinus*, Astracan, p. 332, spp. nn.

Melaleucus, g. n., Chevrolat, CR. Ent. Belg. xxvi. p. xc. Allied to *Baridius*; type, *M. littera*, sp. n., *l. c.* p. xci., Abyssinia; add *B. sellatus*, Boh.

Baris brisouti, sp. n., *id.* S. E. Z. xliii. p. 433, Derbent.

Calandrides.

Chevrolat, A. Calandrides: Nouveaux genres et nouvelles espèces, observations, synonymies, doubles emplois de noms des genres et d'espèces. 1ère partie. Ann. Soc. Ent. Fr. (6) ii. pp. 554–582.

The following synonyms, &c., occur:—*Cyrtotrachelus dux*, var. *rex* noticed; *C. buqueti*, Guér., is distinct, and = *bispinus*, Chevr.; *C. longimanus*, Fabr., var. from Cambodia noticed; *Otidognathus quadrimaculatus*,

Buq., = *assamensis*, Chevr., *Protocerius colossus*, Panz., = *molossus*, Ol., *P. heros*, Fabr., and *goliath*, Guér., = *colossus*, Ol., *Rhynchophorus elegans*, Guér., var. from Java; *ferrugineus*, Ol., var. *tenuirostris*, from Singapore; *pascha*, Boh. (var. *papuana*, Kirsch), *phœnicis*, Fabr., var. from Abyssinia noticed; *zimmermanni*, Schönh., = *cruentatus*, Fabr.; *Aphiocephalus gyllenhali*, Schönh., occurs in Madagascar; *Ommatolampus germari*, Boh., = *allardi*, Chevr., *Sphenocorynus cinereus*, Ill. (= *quadripunctatus*, Web.), *Oxypygus acutus*, Fabr. (= *elongatus*, Dej.), *Oxyopisthen funerarium*, Thoms., = *funebre*, Ill., *Crepidotus audouini*, Gyll., = *variolosus*, Klug, *Cercidocerus lateralis*, Schönh., = *schœnherri*, Guér., *nigro-lateralis*, Guér., = *securifer*, Gaëde; *C. nervosus*, Pasc., var. noticed; *Trigonotarsus calandroides*, Gyll., = *rugosus*, Boisd., *Phacecorynes varius*, Fabr., = *variegatus*, Fabr., *Poteriophorus congestus*, Pasc., ♂ noticed, *Scyphophorus asperulus*, Lec., = *acupunctatus*, Gyll., *Cactophagus procerus*, Lec., = *validus*, Lec., *bifasciatus*, Sturm, and *hœpfneri*, Dej., = *spinola*, Gyll., *stigmaticollis*, Gyll., var. *frumenti*, Sturm, and var. n. *cuneipennis* noticed; *perforatus*, and var. *major*, Schönh., = *striato-foratus*, Gyll.

Chevrolat, Bull. Soc. Ent. Fr. (6) ii. pp. cxxxvii.-cxl., publishes the following synonymic notes on *Calandridæ*:—Schönherr's genera, *Litorrhynchus*, *Conocephalus*, and *Megaproctus*, being pre-occupied, will retain the names of *Otidognathus*, *Apiocephalus*, and *Oxypleurus*, Lac., respectively; *Phacecorynus*, Schönh., the type is *Curculio variegatus*, Fabr.; *Otidognathus* 4-*maculatus*, Buq., and *Sphenophorus* 4-*maculatus*, Gyll., clashing in one genus, are renamed *O. assamensis* and *herbsti* respectively; *Calandra palmarum*, Montr., *nec* Linn., renamed *montrouzieri*; *Sphenophorus ferrugineus*, Boh., *nec* Ol., renamed *Rhynchophorus sumatrensis*; *Rhynchophorus zimmermanni*, Schönh., = *cruentatus*, Fabr.: *R. nitidus*, Guér.: synonyms *pascha*, Boh., *senegalensis*, Gyll., and *caffer*, Ol.; *Sphenophorus*, *S. longicollis*, Ol., is from the East Indies (*glabricollis* and *plumipennis*, Gyll., and *castaneus*, Dej. Cat., are varieties), *S. obscurus*, Fairm., = *insularis*, Boh., and *S.* 4-*spilosus*, Chevr., = 4-*signatus*, Gyll.

Litorrhynchus davidis, Fairm., var. from N. China noticed; *id. l. c.* p. cxi.

Ommatolampus germari, Schönh., *nec* Perty, renamed *allardi* and *Sphenophorus carinicollis*, Roel., *nec* Schönh., renamed *rœlofsi*; id. *l. c.* p. clix.

Oxypygus acutus, Fabr., and *ocellatus*, Guér., are distinct; *O. exclamationis*, Wiedem., belongs to *Zetheus*, Pasc.; *id. l. c.* p. cxlviii.

Sphenophorus. Table of European and Mediterranean species; MT. schw. ent. Ges. vi. pp. 398-402. *S. robustus*, Horn: transformations described and figured; Riley's Rep. Ins. 1882, pp. 138-142, pl. viii. fig. 2. *S. sericans*, Wiedem. (?), noticed; Dohrn, S. E. Z. xliii. p. 459.

Sitophilus granarius, Linn., noticed; Girard, Bull. Soc. Ent. Fr. (6) ii. p. cxxvii.

New genera and species:—

Omotemnus, Chevrolat, Ann. Soc. Ent. Fr. (6) ii. p. 559. Placed after *Protocerius*; to include *Calandra serrirostris*, Ol. (= *miles*, Dej., and varr. *seriatus*, Fabr., and *reaumuri*, Gyll.), and *rhinoceros*, N. China, and *miniato-crinitus* (= *idgja*, Buq.), Java, spp. nn., p. 560.

Dynamis, id. *l. c.* p. 563. Allied to *Rhynchophorus*; to include *Calandra lævissi*, Fabr., *germari*, Perty (= *noxius*, Gyll., and *crassirostris*, Dej.), *politus*, Gyll., and *nitidulus*, Guér. (= *nitidipennis*, Boh.).

Paratasis, id. *l. c.* p. 564. Placed after *Dynamis*; type, *Calandra rubiginosa*, Wied.

Coraliphorus, id. *l. c.* Placed next to last; type, *C. longus*, sp. n., *l. c.* p. 565, East Indies.

Pleurothorax, id. *l. c.* p. 566. Placed after *Prodioctes*; type, *Cercidocerus eximius*, Guér.

Tetratopos, id. *l. c.* p. 569. Placed after *Heterotoxus*; to include *Sphenophorus sericans*, Wiedem. (= *hypocrita*, Gyll., and *6-maculatus*, Dej.), and *sternalis*, sp. n., *l. c.*, Java.

Calyptris, id. *l. c.* p. 570. Placed after *Abœobius*; prothorax rounded, covering the scutellum; abdomen with six segments, first very large, last very small; prosternum flattened, projecting in an obtuse point between the front coxæ, which are smooth, long, and cover the sternum. Type, *Sphenophorus senegalensis*, Gyll. (= *caffer*, Ol.).

Eugithopus, id. *l. c.* p. 576. Allied to *Poteriophorus*; to include *P. albicatus*, Eyd. (var. n. *albiventris* described), *P. vittatus*, Gyll., and *E. monilifasciatus*, sp. n., *l. c.* p. 577, Sylhet.

Æthes, id. *l. c.* p. 582. Placed after *Cactophagus*; to include *Æ. spinicollis*, sp. n., *l. c.* p. 583, Mexico.

Cyrtotrachelus rufo-pectinipes, Andaman, and *obscuriceps*, Ceylon, *id. l. c.* p. 556.

Otidognathus decem-striatus, id. *l. c.* p. 557, Sylhet.

Litorrhynchus subfasciatus, *bifasciatus*, p. cxi., and *rubriceps*, p. cxii., *id.* Bull. Soc. Ent. Fr. (6) ii., Sylhet.

Protocerius marginatus (= *incarnatus*, Chevr., *olim*), Java, *grandis*, Bombay, S. China, p. 558, and *angustipennis*, Sylhet, p. 559, *id.*, Ann. Soc. Ent. Fr. (6) ii.; *P. æmulus*, Dohrn, S. E. Z. xliii. p. 458, Nias.

Rhynchophorus indostanus, Assam, *signaticollis*, Ceylon, p. 562, and *rubro-cinctus*, New Guinea, p. 563, Chevrolat, l. c.; *R. lobatus*, Ritsema, Notes Leyd. Mus. iv. p. 179, Sumatra.

Sphenocorynus irroratus, Manilla, and *pygidialis*, Malacca, Chevrolat, *l. c.* p. 566.

Oxypygus furcatus, id. *l. c.* p. 567, Malacca.

Heterotoxus miniocerus, id. *l. c.* p. 568, Sylhet.

Diathetes seminitidus, Aneiteum, and *semi-tomentosus*, New Caledonia, *id. l. c.* p. 571.

Cercidocerus viduus, Cochin China, *similis*, Philippines, *sutura-alba*, Java, *sulcicollis*, Assam, p. 573, *bisulcatus*, Sylhet, *hæmatopterus*, Celebes, p. 574, and *infernalis*, Assam, p. 575, *id. l. c.*

Sphenophorus orizabensis, *callizona*, p. 578, and *pulcherrimus*, p. 579, id. *l. c.*, Mexico; *S. ragusæ*, Sicily, p. 399, *helveticus*, North Switzerland, p. 400, and *uniseriatus*, Sicily, p. 401, Stierlin, MT. schw. ent. Ges. vi. (the first and last also described in Nat. Sicil. ii. pp. 44 & 45).

Cactophagus auriculatus, *oblique-fasciatus*, *miniato punctatus*, Mexico, p. 580, *quadripunctatus* and *lacordairii*, Colombia, p. 581, Chevrolat, *l. c.*

Oxyrrhynchides.

Oxyrrhynchus. List of species, the name is preoccupied and should be changed; Ritsema, Notes Leyd. Mus. iv. pp. 181, 186 & 187.

Oxyrrhynchus convexus, Sumatra, p. 181, *brevipennis*, Borneo, p. 182, *regularis*, Borneo, Sumatra, p. 184, *sancti-andreæ* (Voll., MS.), Java, *collaris*, Amboina, p. 185, and *fabricii*, Sumatra, Borneo, p. 186, *id. l. c.*: spp. nn.

Cossonides.

Oodemas æneseens, Boh. Doubt concerning locality; Blackburn, Ent. M. M. xix. p. 69.

Pentarthrum helmsianum, sp. n., Sharp, Tr. E. Soc. 1882, p. 91, New Zealand.

Cossonus rotundicollis, sp. n., Faust, Deutsche E. Z. xxvi. p. 282, Amur.

Scolytidæ.

Notes on rare British *Scolytidæ*; Fowler, Ent. xv. pp. 262 & 263.

Hylastes trifolii, Müll., noticed as injurious to clover; Saunders, Rep. E. Soc. Ont. 1881, pp. 43 & 44, fig. 15.

Phlœosinus liminaris, Harr., noticed; Linden, Bull. Buff. Soc. iv. p. 61.

Eutomus, Lac., = *Rhipidendrus*, Lec.; Horn, Bull. Soc. Ent. Fr. (6) ii. pp. cxxxii. & cxxxiii.

Xyleborus saxeseni, Ratz. Larva destructive to beer casks at Rangoon; Distant, P. E. Soc. 1882, p. xvi. [The insect stated to be *Tomicus perforans*, Woll., = *Bostrychus testaceus*, Walk., = ? *B. ferrugineus*, Fabr.; Waterhouse, *op. cit.* pp. xx. & xxi.]

Tomicus typographus, *cembræ*, and *amitinus* discussed and differentiated; Henschel, Ent. Nachr. viii. pp. 97 & 98. *T. cembræ*, Heer, and *mitinus*, Eichh., differentiated; Wachtl, Wien. ent. Z. i. pp. 34 & 35.

Scolytus, sp. destructive to fig trees in Australia; Macleay, P. Linn. Soc. N. S. W. vii. p. 348.

Eccoptoptera cupricollis, Chaud., ♀ described; Lucas, Bull. Soc. Ent. Fr. (6) ii. pp. lxxi. & lxxii.

Homarus and *Stenopus*. Broun (pre-occupied), renamed by him *Acrantus* and *Inosomus* respectively; Ann. N. H. (5) ix. p. 409.

Tiarophorus, g. n., Schreiner, Deutsche E. Z. xxvi. p. 246. Allied to *Dryocœtes*, Eichh., but with the club of the antennæ six-jointed. Type, *T. elongatus*, sp. n., *l. c.* p. 247, Guinea.

Xyleborus eichhoffi, Schreiner, Deutsche E. Z. xxvi. p. 248, Guinea.

Dryocœtes africanus, sp. n., *id. l. c.* p. 246, Guinea.

Brenthidæ.

Diurus furcillatus, Gyll. (♂ ? = *dispar*, Pasc., and *forcipatus*, Westw.), ♀ described; Ritsema, Notes Leyd. Mus. iv. p. 215.

Aprostoma integriceps and *auberti*, spp. nn., Fairmaire, Bull. Soc. Ent. Fr. (6) ii. pp. xii. & xxx., Gaboon.

Diurus erythropus, Sumatra, p. 210, *tarsatus*, Borneo, p. 212, and *antennatus*, Java, p. 214, Ritsema, Notes Leyd. Mus. iv., spp. nn.
Eratiorrhina femoralis, id. *l. c.* p. 188, Sumatra.

Anthotribidæ.

Tropideres, Schönh. Synopsis; Des Gozis, Feuill. Nat. ii. pp 58 & 59, 65–70. (He divides the group into *Choragidæ*, *Anthribidæ*, and *Tropideridæ*.)

New genera and species:—

Nausicus, Pascoe, Ann. N. H. (5) x. p. 455. Allied to *Nessiara*; type, *N. cephalotes*, sp. n., *l. c.* p. 456, pl. xviii. fig. 10, Java.

Doticus, Pascoe, Ann. N. H. (5) ix. p. 27. Allied to *Araeocerus*; front legs very long, with the basal and second joints of the tarsi very long, and the third very short, and deeply embayed in the second. Type, *D. palmaris*, sp. n., *l. c.*; Waterhouse, Aid, ii. pl. civ., Queensland.

Mecocerus annulipes and *plintherioides*, Karsch, B. E. Z. xxvi. p. 402, Chinchoxo.

Tropideres verrucosus, id. *l. c.* p. 388, Colombo; *T. reyi*, Des Gozis, Feuill. Nat. ii. p. 167, France; *T. munieri*, Bedel, Ann. Soc. Ent. Fr. *Rhynch.* p. 8, note, Algeria, Spain.

Xylinades rufo-pictus, Fairmaire, Le Nat. ii. p. 192, Abyssinia; *X. rufofsi*, Ritsema, Notes Leyd. Mus. iv. p. 190, Sumatra.

Polycorynus minor, Karsch, *l. c.* p. 403, Chinchoxo.

Diastotropis crassicornis, *planifrons*, and *nitidipennis*, spp. nn., Waterhouse, Ann. N. H. (5) x. pp. 43–45, Fianarantsoa.

Bruchidæ.

Caryoborus indus, Motsch., occurs in India, not Mexico; Schaufuss, Bull. Soc. Ent. Fr. (6) ii. p. lxxxv.

Spermophagus eximius, sp. n., Chevrolat, Bull. Soc. Ent. Fr. (6) ii. p. clviii., Algeria.

Cerambycidæ.

Ganglbauer, L. Beiträge zur Synonymik der europäischen und caucasischen Cerambyciden. Wien. ent. Z. i. pp. 5–12.

67 species noticed; the nature of the paper precludes a full summary of its contents.

Lameere, A. Liste des Cérambycides décrits postérieurement au Catalogue de Munich. Ann. Ent. Belg. xxvi. pp. 1–78.

Quedenfeldt, G. Kurzer Bericht über die Ergebnisse der Reisen des D. v. Mechow, in Angola und am Quango-Strom, nebst Aufzählung der hierbei gesammelten Longicornen. B. E. Z. xxvi. pp. 317–362, pl. vi.

98 species enumerated, many new. A short account of the expedition and collections is prefixed.

Notes on the nervous system of the *Cerambycidæ* ; Brandt, Hor. Ent. Ross. xvi. pp. x.-xii.

Prionides.

Prionus coriarius, Linn. Habits and transformations noticed; Fronront, CR. Ent. Belg. xxvi. p. cxlv.

Macrotoma sodalis and *obscura*, Waterh., are perhaps identical ; Waterhouse, Ann. N. H. (5) ix. p. 48.

Colpoderus substriatus, Har., ♂ noticed ; Quedenfeldt, B. E. Z. xxvi. p. 323.

Sabarus poggii, Har. Structure of sexes; *id. l. c.*

Calocomus coriaceus, Fairm., noticed ; Dohrn, S. E. Z. xliii. pp. 466 & 467.

New species :—

Parandra aterrima, Quedenfeldt, B. E. Z. xxvi. p. 320, Angola.

Sypilus venturæ, Dohrn, S. E. Z. xliii. p. 465, Mendoza.

Cantharocnemis variolosus, Fairmaire, CR. Ent. Belg. xxvi. p. liv., Zanzibar; *C. latibula*, id. Révoil's Faune et Flore Çomal. *Col.* p. 94, Somali-land.

Tithoes crassipes, Quedenfeldt, *l. c.* p. 320, Angola.

Macrotoma novem-costata and *infans*, id. *l. c.* pp. 321 & 322, Angola; *M. gracilicornis*, Waterhouse, Ann. N. H. (5) ix. p. 47, Fianarantsoa.

Cerambycides.

Saphanus cylindraceus, Fairm., noticed ; Von Heyden, Deutsche E. Z. xxvi. p. 255.

Neomarius gandolphii, Fairm., recorded from France and redescribed; Ganglbauer, Wien. ent. Z. i. p. 137 ; (*cf.* also Puton, Rev. d'Ent. i. p. 138).

Hesperophanes nebulosus, Ol., noticed; De Buysson, Feuill. Nat. ii. pp. 61 & 62.

Eburia basicornis, Chevr., variation noticed; Dohrn, S. E. Z. xliii. pp. 373 & 374.

Elaphidion parallelum. Pupa devoured by larva of *Catogenus rufus* ; Dimmock, Psyche, iii. pp. 341 & 342.

Xylostylon lederi, Reitt., = *Enoploderes sanguineus*, Fald. ; Reitter, Wien. ent. Z. i. p. 67.

Tozotus (*Anthophylax*) *4-maculatus*, Linn., with three eyes ; Letzner, JB. schles. Ges. lix. p. 355.

Lepturidæ. Table of species found in Belgium and the adjacent countries ; Bull. Soc. Dinant. ii. pp. 94-98.

Leptura tuerki, Heyd., = *bicolor*, Redt. ; *L. oxyptera*, Fald., = *jægeri*, Humm. (= *mingrelica*, Tourn.) ; Ganglbauer, *l. c.* pp. 139 & 140. *L. oblongo-maculata*, Buq., and *trisignata*, Fairm., differentiated ; *id. l. c.* pp. 12 & 13.

Desmocerus. Table of N. American species; Horn, Tr. Am. Ent. Soc. ix. p. viii.

Leptidia brevipennis, Muls., recorded as possibly new to Britain ; Fowler, Ent. M. M. xix. p. 89.

Leptura ruficollis, Fabr., = *Cartallum ebulinum*, Linn.; Chevrolat, Ann. Soc. Ent. Fr. (6) ii. p. 57.

Rhopalizus tricolor, Har., and *R. splendens*, Newm. *Euporus strangulatus*, Serv.; Dohrn, S. E. Z. xliii. pp. 252–254, and Quedenfeldt, B. E. Z. xxvi. p. 231.

Euporus brevicornis, Serv., and *Phrosyne brevicornis*, Murr., = *brevicornis*, Fabr.; Quedenfeldt, *l. c.* p. 331.

Callidium alni, var. *nitidum* from Spain described; Chevrolat, Ann. Soc. Ent. Fr. (6) ii. p. 58.

Clytus. Table of Belgian species; Lameere, Bull. Soc. Dinant. ii. pp. 92 & 93. *C. pantherinus*, Saven., is a good species; Ganglbauer, Wien. ent. Z. i. p. 138. *C. arietis*, Linn., *lama*, Muls., and *rhamni*, Germ., differentiated; Puton, Rev. d'Ent. i. p. 137. *C. pictus*, Dru., taking refuge from the sun in the empty leaf-cases formed by the larvæ of *Goniloba* (*Eudamus*) *tityrus*, Fabr.; Reed, Canad. Ent. xiv. p. 160. (The beetle in question is *Cylene robiniæ*, Forst., sec. Moffat, *op. cit.* p. 200.) *C. pictus* and *robiniæ* differentiated; Horn, *op. cit.* p. 246.

Neoclytus, Thoms., = *Plagithmysus*, Motsch.; Horn, Bull. Soc. Ent. Fr. (6) ii. p. cxxxiii.

New genera and species:—

Metopotylus, Quedenfeldt, B. E. Z. xxvi. p. 325. Allied to *Hesperophanes*; front between the eyes strongly and transversely cylindrate and canaliculate. Type, *M. femoratus*, sp. n., *l. c.* p. 326, Angola.

Cloniophorus, id. *l. c.* p. 322. Allied to *Rhopalizus*, but femora as in *Aromia*; type, *C. mechowi*, sp. n., *l. c.* p. 333, pl. vi. fig. 1, Quango.

Dysmathosoma, Waterhouse, Ann. N. H. (5) ix. p. 422. Allied to *Enthymius*; type, *D. picipes*, sp. n., *l. c.* p. 423, Fianarantsoa.

Xystrocera curticollis, Fairmaire, Révoil's Faune et Flore Çomal. *Col.* p. 96, Somali-land.

Plocederus cineraceus, id. *l. c.* p. 99, Somali-land.

Hesperophanes platifemur [*platy-*, and then *vox hybrida*], Chevrolat, Ann. Soc. Ent. Fr. (6) ii. p. 57, Syria.

Stromatium angolense, Quedenfeldt, B. E. Z. xxvi. p. 324, Angola; *S. carinulatum*, Karsch, B. E. Z. xxvi. p. 389, Colombo.

Didymocantha robusta, Sharp, Tr. E. Soc. 1882, p. 92, New Zealand.

Obrium tricolor, Chevrolat, *l. c.* p. 57, Syria.

Anthribola femorata, Waterhouse, Ann. N. H. (5) ix. p. 48, Fianarantsoa.

Mastododera jansoni, id. *l. c.* p. 50, Fianarantsoa.

Astelida auro-sericea, id. *l. c.* p. 326, Fianarantsoa.

Logisticus modestus, id. *op. cit.* x. p. 45, Fianarantsoa.

Toxotus heterocerus, Ganglbauer, Wien. ent. Z. i. p. 139, Cilicia, Gülek.

Vadonia bittisiensis, Asia Minor, and *intermedia*, Siberia, Chevrolat, *l. c.* p. 59.

Desmocerus californicus, S. California, and *cribripennis*, Washington Territory, Horn, Tr. Am. Ent. Soc. ix. pp. vii. & viii.

Callimoxys thoracicus (Kraatz, MS.), Chevrolat, *l. c.* p. 57, Tripoli.

Compsomera cyaneo-nigra, Fairmaire, *l. c.* p. 97, S. Abyssinia.

Phyllocnema semi-ianthina, id. *l. c.* p. 98, Somali-land; *P. viridicostata*, id. CR. Ent. Belg. xxvi. p. liv., Zanzibar.

Rhopalizus coloratus and *chloro-lineatus*, Quedenfeldt, *l. c.* pp. 329 & 330, Angola.

Oxyprosopus latus, id. *l. c.* p. 129, Angola.

Nothopygus speciosus, id. *l. c.* p. 334, Angola.

Closteromerus testaceiventris, Fairmaire, Révoil's Faune et Flore Çomal. *Col.* p. 98, Somali-land; *C. raffrayi*, id. Le Nat. ii. p. 48, Abyssinia.

Euporus nasutus and *amethystinus*, Quedenfeldt, *l. c.* pp. 331 & 332, Angola.

Callidium scabrum, Kraatz, Deutsche E. Z. xxvi. p. 115, Margelan.

Clytus bicallosus, id. *l. c.* p. 235, Samarcand; *C. cinctiventris*, Syria, *ambigenus*, Algeria, and *corsicus*, Corsica, Chevrolat, *l. c.* p. 58; *C. semiruber*, Quedenfeldt, *l. c.* p. 335, Angola.

Clytanthus dimidiatus, id. *ibid.*, Angola.

Leptocera rufo-femorata and *pulchra*, Waterhouse, *l. c.* p. 327, Fianarantsoa.

Smodicum syriacum, Chevrolat, *l. c.* p. 59, Syria.

Lamiides.

Quedenfeldt redescribes or figures his *Sternotomis variabilis*, p. 341, *Ceroplesis mechowi*, fig. 4, p. 347, *Gnathœnia albo-maculata*, fig. 5, p. 348, *Cymatura bizonata*, p. 352, *mechowi*, fig. 8, p. 353, *Acmocera undulata* and *Acrydoschema ligatum*, fig. 9, p. 354, B. E. Z. xxvi. pl. vi.

Dorcadion. Melanic varieties noticed of *D. graellsi*, *hispanicum* (var. *encaustum*), *perrisi* (var. *anthracinum*), and *fuliginatum* (*D. atrum*, Bach, and *obesum*, Gaut.); Chevrolat, Ann. Soc. Ent. Fr. (6) ii. p. 60, note. *D. escorialense*, Chevr., = *molitor*, Fabr. var., p. 60; *D. graecum*, Waltl, noticed, p. 228; *D. immersum*, Tourn., = *kindermanni*, var.; *D. nodicorne*, Tourn., is probably a race of 4-*maculatum*, Küst.; *D. abeillii*, Tourn., = *laqueatum*, var.; *D. balcanicum*, Tourn., = *exornatum*, Friv., var.; *D. impressicorne*, Tourn., is probably (like *micans*, Thoms., and *sericatum*, Kraatz) only a form of *sericatum*, Kryn., pp. 298–301; Ganglbauer, Wien. ent. Z. i. *D. molitor*: transformations described; Mayet, Bull. Soc. Ent. Fr. (6) ii. pp. lix.–lxi.

Phrissoma sansibaricum, Har., noticed; Fairmaire, CR. Ent. Belg. xxvi. p. lv.

Lamia continua, Oliv., = *Ceraplesis bicincta*, Fabr.; Quedenfeldt, *l. c.* p. 348.

Diochares, Reitt., is not distinct from *Xenoscelis*, Schauf.; Schaufuss, Nunq. Ot. iii. p. 533. *D. depressus*, Reitt., = *Xenoscelis deplanatus*, Woll.; *id.* Bull. Soc. Ent. Fr. (6) ii. pp. lxxxiv. & lxxxv.

Periaptodes testator, Pascoe, figured by Waterhouse, Aid, ii. pl. cx.

Pinacosterna mechowi, Quedenfeldt, redescribed and figured by him; B. E. Z. xxvi. p. 345, pl. vi. fig. 3.

Ceroplesis irregularis, Har. (= *adspersus*, Pasc.) noticed; Fairmaire, *l. c.* pl. lv.

Frea maculicollis, Thoms., var. *fusco-maculata* from the Quango noticed; Quedenfeldt, *l. c.* p. 356.

Pogonocherus mixtus, Hald., and *Gaurotes cyanipennis*, Say. Habits; Caulfield, Rep. E. Soc. Ont. 1881, pp. 30 & 31.

Leiocentrus adspersus, Muls., noticed; Lucas & De Bony, Bull. Soc. Ent. Fr. (6) ii. pp. lxxxi., lxxxiii. & lxxxiv.

Colobothea musica, Germ., amended description; Dohrn, S. E. Z. xliii. p. 374.

Agapanthia: notes on larvæ, and *A. irrorata*, var. *integra* from Sicily described; Chevrolat, Ann. Soc. Ent. Fr. (6) ii. p. 64.

Oberea mauritanica, Luc., belongs to *Phytœcia*; id. *l. c.* p. 63.

New genera and species :—

Mesosites, Deichmüller, Verh. L.-C. Ak. xlii. p. 319. Not characterized; apparently belongs to the *Mesosidæ*, Lac. Type, *M. macrophthalmus*, sp. n., *l. c.* pl. xxi. fig. 12, Kutschlin (fossil).

Brachytritus, Quedenfeldt, B. E. Z. xxvi. p. 350. Allied to *Pachystola*, Reiche, but with the third joint of the antennæ remarkably short; type, *B. hieroglyphicus*, sp. n., *l. c.* p. 351, pl. vi. figs. 7 & 7*a*, Angola.

Lasiocercis, Waterhouse, Ann. N. H. (5) ix. p. 420. Allied to *Dichostates* and *Ranca*; type, *L. fasciata*, sp. n., *l. c.*, Fianarantsoa.

Dioristus, id. *op. cit.* x. p. 46. Allied to *Niphona*; type, *D. albo-lateralis*, sp. n., *l. c.*, p. 47, Fianarantsoa.

Diadelia, id. *op. cit.* ix. p. 421. Allied to *Amblesthis*; type, *D. biplagiata*, sp n., *l. c.*, Fianarantsoa.

Mesolamia, Sharp, Tr. E. Soc. 1882, p. 96. Allied to *Tetrorea*; type, *M. marmorata*, sp. n., *l. c.* p. 97, New Zealand.

Mystrocnemis, Quedenfeldt, *l. c.* p. 361. Allied to *Dyenmonus*, Thoms.; type, *M. flavo-vittata*, sp. n., *l. c.* p. 362, pl. vi. figs. 11 & 11*a*, Angola.

Xylotoles huttoni, Sharp, Tr. E. Soc. 1882, p. 93, New Zealand.

Somatidia helmsi, id. *ibid.*, New Zealand.

Hybolasius deplanatus, id. *l. c.* p. 94, New Zealand.

Dorcadion bilaterale, Greece, p. 59, *bifidum*, Smyrna, *annulicorne*, Greece, and *fuscifrons*, Albania, p. 60, Chevrolat, Ann. Soc. Ent. Fr. (6) ii.; *D. cribricolle*, Kraatz, Deutsche E. Z. xxvi. p. 196, Altai.

Dorcatypus confirmatus, Chevrolat, *l. c.* p. 61, locality unknown.

Lamia gennadii, Buquet, Bull. Soc. Ent. Fr. (6) ii. p. cxxxvii., Greece.

Monohammus pannulatus and *scabiosus*, Quedenfeldt, B. E. Z. xxvi. pp. 337 & 338, Angola.

Mesosa rosa, Karsch, B. E. Z. xxvi. p. 388, Colombo.

Lasiopezus nigro-maculatus and *onca*, Quedenfeldt, *l. c.* pp. 339 & 340, Angola.

Sternotomis fulvo-signata, id. *l. c.* p. 343, pl. vi. figs. 2, 2*a* & 2*b*, Angola.

Quimalanca scabricollis and *lineata*, id. *l. c.* p. 344, Angola.

Pinacosterna weymanni, id. *l. c.* p. 346, Angola.

Tragocephala trifasciata, id. *ibid.*, Angola.

Ceroplesis atropos, Fairmaire, Le Nat. ii. p. 48, Abyssinia; *C. male-picta*, id. CR. Ent. Belg. xxvi. p. lv., Zanzibar; *C. revoili*, id. Révoil's Faune et Flore Çomal. *Col.* p. 100, pl. i. fig. 8, Somali-land; *C. mechowi*, Quedenfeldt, *l. c.* p. 185, Quango.

Eurysops lituratus, Quedenfelt, *l. c.* p. 349, pl. vi. figs. 6 & 6*a*, Angola.
Acmocera undulata, id. *l. c.* p. 185, Quango.
Acrydoschema ligata, id. *ibid.*, Quango.
Oleneamptus hofmanni, id. *l. c.* p. 355, pl. vi. fig. 10, Angola.
Crossotus flavo-pictus and *virgatus*, id. *l. c.* pp. 356 & 357, Angola; *C. vestiticornis*, Fairmaire, CR. Ent. Belg. xxvi. p. lvi., Zanzibar.
Elithiotes costulata, Quedenfeldt, *l. c.* p. 359, Angola.
Tetrorea sellata and *discedens*, Sharp, *l. c.* p. 95, New Zealand.
Hippopsicon luteolum, Quedenfeldt, *l. c.* p. 360, Angola.
Agapanthia verecunda and *subacutalis*, Chevrolat, *l. c.* p. 63, Syria; *A. detrita* and *soror*, Kraatz, *l. c.* p. 336, Samarcand.
Phytœcia nivea, Margelan, p. 116, *circumdata*, *ochraceipennis*, and *cinerascens*, Samarcand, p. 337, *id.* l. c.; *P. binodosa*, *tripunctata*, *bisulcata*, Syria, p. 61, *abdominalis*, Spain, *nigritarsis*, Algeria, *brevis*, Syria (?), p. 62, *frontalis* and *scapularis*, Syria, p. 63, Chevrolat, *l. c.*
Oberea semirufa, Kraatz, *l. c.* p. 115, Margelan.

Chrysomelidæ.

Donaciides.

Donacia. Fossil species noticed and figured, with elytra of recent species for comparison; Sordelli, Rend. Ist. Lomb. (2) xv. pp. 135–138, figs. 2–4, and Bull. Ent. Ital. xiv. pp. 229–233, figs.
Donacia kraatzi, sp. n., Weise, Ins. Deutschl. *Col.* vi. p. 38, note, Amasia.

Criocerides.

Lema. 3 undetermined species from Chinchoxo noticed; Karsch, B. E. Z. xxvi. pp. 395 & 396.
Crioceris: undetermined species from Chinchoxo noticed; *id. l. c.* p. 396. *C. asparagi*: black variety noticed; Lucas, Bull. Soc. Ent. Fr. (6) ii. p. clviii. *C. stercoraria*, Linn., var. *laviuscula* from Andalusia noticed; Weise, Ins. Deutschl. *Col.* vi. p. 69.

Clithrides.

Labidostomis centrimaculata, Géné, var. *damrii* from Sardinia described; *id. l. c.* p. 95, note.
Clithra fasciata, Lac.: varieties from Guinea noticed; Dohrn, S. E. Z. xliii. p. 252. *C. taxicornis*, Fabr.: colour of antennæ; *id. l. c.* p. 473.
Cyaniris thoracica, Küst., = *xanthaspis*, Germ.; Weise, Deutsche E. Z. xxvi. p. 55.

New species:—

Labidostomis beckeri, Weise, Ins. Deutschl. *Col.* vi. p. 93, note, Sarepta.
Lachnæa orientalis, id. *l. c.* p. 111, note, Crete.
Melitonema simoni, id. *l. c.* p. 112, note, Ashanti.
Gynandrophthalma baetica, id. *l. c.* p. 123, Andalusia; *G. viridis*, Kraatz,

Deutsche E. Z. xxvi. p. 338, Samarcand; *G. discolor*, Solsky, Troudy Ent. Ross. xiii. p. 58, Sarafschan.

Cryptocephala rufina, id. *l. c.* p. 60, Kisil-Kum; *C. falkensteini*, Karsch, B. E. Z. xxvi. p. 396, pl. iv. fig. 2, Chinchoxo.

Chlamydides.

Neochlamys, g. n., Jacoby, P. Z. S. 1882, p. 51. Allied to *Spharocharis*; antennæ short, joints 4 and 5 long, of equal length, the rest gradually transverse, subserrate; claws simple. Type, *N. strigicollis*, sp. n., *l. c.* Brazil (?).

Cryptocephalides.

Cryptocephalus marginellus, Ol., and *pallidicinctus*, Fairm., noticed; Ragusa, Nat. Sicil. i. p. 251.

Pachybrachys, Suffr. Weise (Ins. Deutschl. vi. pp. 245-269) briefly notices many varieties of known species.

Thelyterotarsus, g. n, Weise, Ins. Deutschl. *Col.* vi. p. 246, note. Allied to *Pachybrachys*, but without epipleuræ; type, *T. fausti*, sp. n., *l. c.* p. 247, note, Shahrud.

Cryptocephalus reitteri, Croatia, p. 172, *wehnckii*, Taurus, p. 179, note, *simoni*, Algesiras, p. 205, note, *czwalinæ*, Vallombrosa, p. 216, note, *fausti*, Derbent, p. 236, note, *planifrons*, Carinthia, Hungary, &c., p. 239, and *orianensis*, Oran, p. 244, note, *id. l. c.*; *C. rufus*, Kraatz, Deutsche E. Z. xxvi. p. 116, Margelan; *C. rufo-fasciatus*, Kisil-Kum, p. 69, *hectastigmus*, Katty-Kurgan, p. 71, *melanoxanthus*, Kokand, Sarafschan, p. 73, *sarafschanensis*, Sarafschan, p. 76, and *polymorphus*, Sarafschan, Kokand, p. 78, Solsky, Troudy Ent. Ross. xiii.; *C. bitæniatus*, id. Hor. Ent. Ross. xvi. p. 438, Samarcand and Sarafschan: spp. nn.

Pachybrachys albicans, Kasumkent, p. 248, note, *suturalis* and var. *gallicus*, Bavaria, France, p. 252, *kraatzi* (=*fulvipes*, Mars., *nec* Suffr.), Spain, p. 255, note, *flexuosus* and var. *viennensis*, Austria, S. Europe, p. 254, and *bæticus*, Andalusia, p. 269, note, Weise, *l. c.*, spp nn.

Stylosomus erythrocephalus, Mars., *nec* Suffr., renamed *macer*; *id. l. c.* p. 271, note.

Lamprosomatides.

Lychnophaes africana, sp. n., Jacoby, P. Z. S. 1882, p. 50, South Africa.

Lamprosoma grande, id. *ibid.*, Amazons; *L. africanum*, Weise, Ins. Deutschl. *Col.* vi. p. 281, note, South Africa: spp. nn.

Eumolpides.

Jacoby, Biol. Centr. Am. *Col.* vi. (1), figures the following known species:—*Colaspis impressa*, Lef., pl. viii. fig. 23, *Chalcophana cincta*, Klug, pl. vii. fig. 9, *mutabilis*, figs. 22-24, and *discolor*, Har., fig. 25, pl. vi., *rufipennis*, Jac., pl viii. fig. 17; *Fidia pedestris*, fig. 12, *spurca*, fig. 11, *humeralis*, fig. 13, *plagiata*, figs. 14 & 15, *albo-vittata*, fig. 16, *sallæi*, fig. 17, pl. vii., and *guatemalensis*, pl. ix. fig. 6; *Eumolpus surinamensis*, Fabr., figs. 14 & 16, *speciosus*, Baly, fig. 15, *Tymnes verticalis*, Chap., fig. 19, pl. ix.; *Myochrous sallæi*, Baly, fig. 19; *Glyptoscelis albicans*, Baly, fig. 4; *Typo-*

phorus humeralis, Baly, figs. 22 & 23, *viridicyanea*, Crotch (= *sturmi*, Lef.), fig. 21, *mexicanus*, Jac., fig. 24, pl. vii.; *Colaspoides batesi* and *unicolor*, Jac., pl. ix. figs. 17 & 18.

Colaspis puncticollis, Broun, renamed *punctulicollis*; Broun, N. Z. J. Sci. i. p. 128.

New genera and species:—

Eulychius, Jacoby, P. Z. S. 1882, p 52. Allied to *Sybriacus*; apical joints of antennæ broadly transverse and flattened; femora unarmed, claws bifid. Type, *E. madagascariensis*, sp. n., *l. c.*, Madagascar.

Balya, id. *l. c.* p. 53. *Iphimeinæ*; shape elongate, subcylindrical; middle and hind tibiæ of ♂ toothed. Type, *B. quadrimaculata*, sp. n., *l. c.*, Lagoa Santa, Brazil.

Calliope, Weise, Ins. Deutschl. *Col.* vi. p. 279. Allied to *Pseudocolaspis*; claws incised in the middle, scutellum triangular, elytra rounded at the tip when closed, humeral collar and epipleuræ absent. Type, *C. fausti*, Caucasus, sp. n., *l. c.* p. 280, note.

Terillus porosus, Jacoby, P. Z. S. 1882, p. 54, Cooktown, Australia.

Chiridea subrugosa, id. *l. c.* p. 55, Cameroons.

Malacosoma quadrimaculatum, Natal, *politum*, p. 57, and *flavo-margi-tum*, South Africa, p. 58, *id. l. c.*

Colaspis jansoni, Chontales, *godmani*, British Honduras, Guatemala, Chontales, p. 145, and *plicatula*, Guatemala, p. 146, *id.* Biol. Centr. Am. *Col.* vi. (1); *C. tarsata*, Lefevre, Bull. Soc. Ent. Fr. (6) ii. p. clxxx., Bolivia.

Aletes latericostatus, id. *ibid.*, Ecuador; *A. mexicanus*, pl. vii. fig. 5, Mexico, p. 146, *guatemalensis* and *variabilis*, pl. ix. fig. 1, p. 147, Guatemala, Jacoby, *l. c.*

Rhabdophorus mexicanus, pl. viii. fig. 24, Mexico, Guatemala, Panama, *salvini*, pl. ix. fig. 2, Mexico, Guatemala, p. 148, *perplexus*, Guatemala, *jansoni*, Chontales, p. 149, *rugosus*, pl. vii. fig. 8, Mexico, *guatemalensis*, pl. viii. fig. 22, Mexico, Guatemala, Nicaragua, British Honduras, p. 150, *chontalensis*, *violaceus*, Chontales, p. 151, *fulvipes*, Mexico, Guatemala, British Honduras, Panama, p. 152, *thoracicus*, Chontales, Panama, and *intermedius*, Guatemala, p. 153, *id.* l. c.; *R. rugulosus*, Lefevre, *l. c.* p. clxxx., Ecuador.

Corysthea violacea, Jacoby, *l. c.* p. 154, pl. ix. fig. 3, Guatemala.

Chalcophana championi, Guatemala, Costa Rica, p. 155, *depressa*, p. 156, *germari*, Mexico, p. 158, *godmani*, pl. vii. fig. 10, Mexico, Panama, p. 160, *hybrida*, Guatemala, *obscura*, Mexico, p. 161, *simplex*, British Honduras, and *dissimilis*, Guatemala, p. 162, *id.* l. c.; *C. kirschi*, Bolivia, and *humeralis*, Ecuador, Lefevre, *l. c.* pp. clxxx. & clxxxi.

Nodostoma sarafschanica[*-cum*], Taschkend, Sarafschan, and *kokanica*[*-cum*], Kokand, Solsky, Trondy Ent. Ross xiii. pp. 62 & 64.

Xanthonia guatemalensis, pl. vii. fig. 20, Mexico, Guatemala, *plagiata*, p. 164, *nigro-fasciata*, Guatemala, *marmorata*, pl. ix. fig. 5, Mexico, Guatemala, p. 165, and *tuberosa*, pl. ix. fig. 4, Mexico, p. 166, Jacoby, *l. c.*

Fidia lateralis, Mexico, *unistriata*, Guatemala, and *atra*, Mexico, *id. l. c.* p. 168.

Habrophora maculipennis, id. *l. c.* p. 169, Central America generally.

Nevissus griseo-scutellatus, Karsch, B. E. Z. xxvi. p. 396, pl. iv. fig. 11, Chinchoxo.

Pseudocolaspis sarradensis and *luctuosa*, Solsky, *l. c.* pp. 65 & 67, Sarafschan; *P. albo-lineatus*, Zanzibar, and *candens*, Usagara, Ancey, Le Nat. ii. p. 54; *P. lindneri*, Karsch, B. E. Z. xxvi. p. 398, Chinchoxo.

Metachroma variabilis[*-le*], fig. 7, British Honduras, Guatemala, *regularis*[*-re*], Mexico, p. 170, *convexa*[*-xum*], Chontales, *minuta*[*-tum*], British Honduras, *mexicana*[*-num*], fig. 11, Mexico, p. 171, and *guatemalensis*[*-se*], Guatemala, p. 172, Jacoby, *l. c.* pl. ix.

Euryope angulicollis and *rufo-nigra*, Fairmaire, Révoil's Faune et Flore Çomal. *Col.* pp. 101 & 102; *E. marginalis*, Ancey, *l. c.* p. 79: all from Somali-land.

Myochrous melancholicus, pl. vii. fig. 18, Mexico, Panama, p. 174, *tibialis*, pl. ix. fig. 8, British Honduras, Guatemala, *femoralis*, British Honduras, p. 175, and *albo-villosus*, Mexico, p. 176, Jacoby, *l. c.*

Glyptoscelis chontalensis, Chontales, and *mexicanus*, Mexico, *id. l. c.* pp. 176 & 177.

Pachnephorus canus, Sicily, East Russia, and *baticus*, Andalusia, Weise, Ins. Deutschl. *Col.* vi. pp. 285 & 287, note; *P. holosericeus*, Karsch, *l. c.* p. 397, Chinchoxo.

Typophorus paradoxus, British Honduras, p. 179, *erythrocephalus*, p. 180, *nigricollis*, Mexico, *sub-brunneus*, British Honduras, Guatemala, p. 181, *purulensis*, and *variabilis*, Guatemala and Panama, p. 182, Jacoby, *l. c.*

Paria vitticollis, figs. 9 & 10, *brunneus*, Panama, p. 183, *nigritarsus*, fig. 12, Guatemala, *lævipennis*, fig. 13, pl. ix., British Honduras, Guatemala, and *tibialis*, Guatemala, p. 184, *id. l. c.*

Menius viridiæneus, id. P. Z. S. 1882, p. 54, Cameroons.

Eurydemus guessfeldti, Karsch, *l. c.* p. 397, Chinchoxo.

Colaspoides chiriquensis, Chiriqui, p. 186, *quadriplagiatus*, and *marginatus*, Guatemala, p. 187, Jacoby, Biol. Centr. Am. *Col.* vi. (1).

Chrysomelides.

Jacoby, Biol. Centr. Am. *Col.* vi. (1), figures the following known species:—*Phædon cyanescens*, Stål, pl. ix. fig. 21, *cyanopterum*, Guér., pl. x. fig. 4, *Plagiodera punctigera*, *semivittata*, *congesta*, *maculatella*, and *flocculosa* (figured as *æneicentris*), Stål, pl. ix. figs. 22–25, pl. x. fig. 1; *Lina scripta*, Fabr., fig. 2, *depressa*, Suffr., fig. 3, *Calligrapha æneo-picta*, Stål, fig. 12, *diversa*, Stål, fig. 15, *geographica*, Stål, fig. 18, *computa*, Stål, fig. 17, pl. x. *scalaris*, Lec., pl. xi. fig. 6, *multipustulata*, Stål, fig. 16, *ancoralis*, Stål, fig. 20, *notatipennis*, Stål, fig. 25, pl. x., *labyrinthica*, Stål, pl. xi. figs. 1–3, *suboculata*, Stål, pl. x. figs. 13, 14 & 23, *pmirsa*, Stål, fig. 18, *ramulifera*, Stål, fig. 4, pl. xi., *argus*, Stål (=*famularis*, Stål), fig. 19, *tortilis*, Stål, fig. 21, *cupatris*, Stål, fig. 22, *serpentina*, Rogers, fig. 11, pl. x., *viginti-maculata*, Chevr., fig. 11, *stillatipennis*, Stål, figs. 14 & 15, pl. xi., *multi-guttata*, Stål, pl. x. figs. 5 & 6, *barda*, Say, pl. xi. figs. 12 & 13, *billbergi*, *fulvipes*, *pantherina*, and *felina*, Stål, figs. 7–10, *limbaticollis*, Stål, figs. 8 & 9, *gyllenhali*, Stål, fig. 9, *cuplecta*, Stål, fig. 5, *sylvia*, Stål, fig. 7, *matronalis*, Erichs., fig. 17, pl. xi., *elegantula* and *violaceo maculata*, Jac., pl. xiv.

figs 18 & 22, *Zygogramma quenseli*, Stål, pl. x. fig. 24, *piccicollis*, Stål, pl. xi. figs. 23–25, *signatipennis*, Stål, pl. xiv. fig. 24, *dalcis*, Stål, fig. 1, *malva*, Stål, fig. 2, *lemur*, Stål, figs. 8 & 9, *opifera*, Stål, figs. 10 & 11, pl. xii., *bigenera*, Stål, pl. xi. fig. 22, *guttulosa*, Stål, fig. 12, *popa*, Stål, fig. 13, *lentiginosa*, Stål, figs. 14 & 15, *quinque-virgata*, Stål, fig. 21, *aneovittata*, Stål, fig. 3, *lepidula*, Stål, fig. 16, *morbillosa*, Stål, fig. 17, *clathrata*, Sturm, figs. 18 & 19, *championi*, Jac., fig. 6, *novem-virgata*, Stål, fig. 5, pl. xii., *Stilodes atro-maculata*, Stål, pl. xiii. fig. 8, *cœlebs*, Stål, pl. xii. fig. 25, *neptis*, Stål, fig. 24, and *motschulskii*, fig. 4, pl. xiii.

Phædon. Note on food-plants of different species; Hart, Ent. xv. pp. 23 & 24. *P. tumidulum*, Kirb., notes on life-history; *id. l. c.* pp. 213 & 214.

Plagiodera armoraciæ, Linn., noticed; Lewcock & Wood, Ent. xv. pp. 22, 23, & 46.

Lina cuprea, Fabr., destructive to hazels and willows in Norway; Ormerod, P. E. Soc. 1882, p. xix. *L. longicollis*: larva described; Pennell, Ent. xv. pp. 46 & 47.

Melasoma cupreum, Fabr., with malformation of right fore-leg; Rossi, Ent. Nachr. viii. p. 23. *M. lapponicum*, var. *cæruleum*, Gradl, = *bulgharense*, Fabr.; Kraatz, Deutsche E. Z. xxvi. p. 156.

Chrysomela americana, L. Variety from the Greek Islands noticed; Von Heldreich, SB. nat. Fr. 1882, pp. 36 & 37. *C. fastuosa*, Linn., discussed; Malakoff, Troudy Ent. Ross. xii. pp. xx.–xxiii. *C. obesa*, Vogel, noticed; Fairmaire, CR. Ent. Belg. xxvi. p. lvi. *C.* (*Orina*) *splendidula*, Fairm. (*nec* Fabr.), renamed *fairmairiana*: it is quite distinct from *elegans*, Aragu. (= *genei*, Suffr.); Des Gozis, Rev. d'Ent. i. pp. 206 & 207.

Deuterocampta flavo-maculata and *flavo-signata*, Stål, are specifically identical; Dohrn, S. E. Z. xliii. p. 363.

Doryphora juncta attacking the egg-plant; Riley, Am. Nat. xvi. pp. 678 & 679.

Æsernia tricolor, Chevr. Larva described; Lucas, Bull. Soc. Ent. Fr. (6) ii. pp. clxv. & clxvi.

Phyllodecta viennensis, Schrank, discussed; Weise, Deutsche E. Z. xxvi. pp. 157 & 158.

New genera and species:—

Eremosis, Des Gozis, Rev. d'Ent. i. p. 207. Allied to *Prasocuris* and *Phædon*; type not stated.

Allocharis, Sharp, Tr. E. Soc. 1882, p. 99. Affinities uncertain; probably allied to the group *Phyllocharites* of Chapuis. Type, *A. marginata*, sp. n., *l. c.* p. 99, New Zealand.

Phædon mexicanum, Jacoby, Biol. Centr. Am. *Col.* vi. (1) p. 189, pl. ix. fig. 20, Mexico.

Plagiodera vitticollis, Guatemala, p. 191, *uniformis*, Mexico to Panama, and *unicolor*, Mexico, p. 192, *id. l. c.*

Melasoma (*Lina*) *spinata*[*-tum*], Karsch, B. E. Z. xxvi. p. 397, pl. iv. fig. 5, Chinchoxo.

Chrysomela schneideri, Tatra, and *caucasica*, Caucasus, Weise, Ins.

Deutschl. *Col.* vi. pp. 349 and 352, notes; *C. timandroides*, Brisout, Bull. Soc. Ent. Fr. (6) ii. p. clxxix.

Calligrapha novem-maculata, fig. 20, Guatemala, p. 198, *suffriani*, fig. 16, p. 199, and *intermedia*, fig. 19, Mexico, p. 200, Jacoby, *l. c.* pl. xi.

Zygogramma nicaraguensis[*-se*], pl. xi. fig. 21, Chontales, p. 209, *mexicana*[*-num*], fig. 7, p. 212, *stali*, fig. 4, p. 217, *ornata*[*-tum*], figs. 22 & 23, Mexico, p. 218, *hypocrita*, fig. 20, Guatemala, p. 219, and *gracilis*[*-le*], Mexico, p. 220, *id. l. c.* pl. xii.

Leucocera quadriguttata and *ferruginea* (Dej. Cat., = *pallidicornis*, Chevr., *olim*), Chevrolat, Bull. Soc. Ent. Fr. (6) ii. p. lxxx., St. Domingo.

Stilodes modesta, Guatemala, p. 222, *nigro-marginata*, fig. 1, Mexico, p. 223, and *nigricollis*, fig. 2, Guatemala, p. 224, Jacoby, *l. c.* pl. xiii.

Doryphora amazona, Amazons, p. 43, *flavo-pustulata*, Brazil, *quinquepunctata*, Colombia, p. 44, *id.* Cist. Ent. iii.

Ceralces pechueli, Karsch, *l. c.* p. 397, pl. iv. fig. 10, Chinchoxo.

Timarcha heydeni, Spain, p. 321, note, *venosula*, Carniola, Trieste, p. 325, *maroccana*, p. 325, note, and *ventricosa*, Morocco, p. 327, note, Weise, *l. c.*

Cyrtonus contractus, Sierra Nevada, *puncticeps*, Spain, *oomorphus*, Pyrenees, Fairmaire, Le Nat. ii. p. 19.

Entomoscelis suturalis, Weise, *l. c.* p. 312, note, Greece, &c.; *E. dohrni*, Solsky, Troudy Ent. Ross. xiii. p. 81, Tashkend.

Chalcolampra speculifera, Sharp, Tr. E. Soc. 1882, p. 98, New Zealand.

Halticides.

Leesberg, A. F. A. Bijdrage tot de Kennis der Inlandsche Halticiden. Tijdschr. Ent. xxv. pp. 137–178, pl. xi. (continued from *op. cit.* xxiv.).

Extends from *Crepidodera* to *Longitarsus*.

Diamphidia angolensis, sp. n., Jacoby, P. Z. S. 1882, p. 55, Angola.

Galerucides.

Aulacophora rosea, Fabr., noticed; Dohrn, S. E. Z. xliii. p. 460.

Lyperus garieli, Aubé, var. (?) from Tyrol described; Gredler, Z. Ferd. (3) xxvi. p. 236.

Lyperodes, Motsch., noticed; Jacoby, P. Z. S. 1882, p. 56.

New species :—

Aulacophora conifera, Fairmaire, CR. Ent. Belg. xxvi p. lvi., Zanzibar; *A.* (*Rhaphidopalpa*) *oculata*, Karsch, B. E. Z. xxvi. p. 388, pl. iv. fig. 7, Chinchoxo.

Diacantha soyauxi, fig. 8, *deusseni*, fig. 6, p. 398, *nigritarsis*, fig. 1, *flavipes*, fig. 3, *interrupta*, fig. 9, and *D.* (?) *fenestrata*, fig. 4, p. 399, *id. l. c.* pl. iv., Chinchoxo.

Diabrotica olivacea, Bogota, *prolongata*, Rio de Janeiro, *venezuelensis*, Merida, Venezuela, p. 45, *distincta*, Amazons, *centralis*, *oblongo-punctata*, Caracas, p. 46, *unipunctata*, Bogota, and *albo-plagiata*, Amazons, p. 47, Jacoby, Cist. Ent. iii.

Lyperodes marginatus, Lagos, and *australis*, Australia, id. P. Z. S. 1882, p. 56.

Galeruca margelanica, Kraatz, Deutsche E. Z. xxvi. p. 117, Margelan.
Haplosonyx fromholzi, Karsch, *l. c.* p. 399, pl. iv. fig. 12, Chinchoxo.
Monolepta ferruginea, *lineata*, and *foveolata*, id. *l. c.* p. 400, Chinchoxo.
Goniopleura basalis, Jacoby, P. Z. S. 1882, p. 58, Sumatra.

Hispides.

Chalepus trachypygus, Burm. Transformations described and figured; Riley's Rep. Ins. 1882, pp. 128 & 129, pl. vi. fig. 5.

Cassidides.

Calliaspis cinnabarina, Boh., is hardly distinct from *rubra*, Oliv.; Dohrn, S. E. Z. xliii. p. 256.

Cassida texana, Crotch, feeding on the egg-plant; Riley, Am. Nat. xvi. p. 679.

Coptocycla aurichalcea. Variation, and change of colour in living specimens; Leconte, Tr. Am. Ent. Soc. ix. p. xxii.

Metriopepla, g. n., Fairmaire, CR. Ent. Belg. xxvi. p. lvii. Allied to *Calopepla*; second joint of antennæ nearly as long as third; head large; prothorax with a large shallow concavity in front, with prominent lateral angles; mesothorax slender, flattened at the edges; body not rugose, and less concave than in *Calopepla*. Type, *M. lividula*, sp. n., *ibid.*, Zanzibar. *Calopepla livingstonii*, Baly, may also belong to this genus.

Aspidomorpha tieffenbachi and *schelleri*, spp. nn., Karsch, B. E. Z. xxvi. p. 401, pl. iv. figs. 14 & 16, Chinchoxo.

Cassida obtecta, Fairmaire, Révoil's Faune et Flore Çomal. *Col.* p. 103, Somali-land; *C. externe-guttata*, id. CR. Ent. Belg. xxvi. p. lviii., Zanzibar: spp. nn.

Languriidæ.

Languria mozardi noticed as injurious to clover; Saunders, Rep. E. Soc. Ont. 1881, p. 44, fig. 16.

Callilanguria luzonica, Crotch, figured by Waterhouse, Aid. i. pl. lxxxv.

Erotylidæ.

Hypodacne, Lec., = *Tritomidea*, Motsch., = *Euxestes*, Woll.; Reitter, Wien. ent. Z. i. p. 199.

Coptengis exorbitans, sp. n., Dohrn, S. E. Z. xliii. p. 252, Sunda.

Orestia sierrana, sp. n., Von Heyden, Deutsche E. Z. xxvi. p. 48, Andalusia.

Cyrtotriplax colombonica, sp. n., Karsch, B. E. Z. xxvi. p. 388, Colombo.

Endomychidæ.

Alexia meridionalis, Reitt., = *pilosella*, Reitt.; Reitter, Wien. ent. Z. i. p. 199.

Ancylopus testaceus, sp. n., Costa, Atti Acc. Nap. ix. (6) p. 36, fig. 6, Calabria.

Dapsa acuticolle[*-lis*], sp. n., Reitter, Nat. Sicil. i. p. 231, Algesiras.

COCCINELLIDÆ.

Many new varieties of *Coccinellidæ* described; Walter, Ent. Nachr. viii. pp. 17–20.

On naming varieties of *Coccinellidæ*; Weise, Wien. ent. Z. i. pp. 115–117.

Notes on American *Coccinellidæ*, several of which are figured with transformations; Comstock & Riley, Rep. Ins. 1881, pp. 12–14, 1882, pp. 144–216, pl. xviii.

Coccinella, *Halyzia*, and *Phytodecta*, varieties of various species described; Gradl, Ent. Nachr. viii. pp. 326–331.

Coccinella 10-*punctata*, var. 10-*pustulata*, Linn., and *Adalia bipunctata*, var. 6-*pustulata*, Linn., pairing; Rossi, Ent. Nachr. viii. p. 12.

Coccinella: abnormal specimen noticed; Gorham, P. E. Soc. 1882, p. vi. *C.* 7-*punctata* observed in abundance, though stupified with cold, on the summit of the Mountain de la Balme de Sillinguy, Oct. 8, 1881, 900 metres above sea-level; Schardt, Bull. Soc. Vaud. xviii. p. xxvii.

Cleothera abendrothi, Kirsch, and *gacognii*, Muls., are distinct; Kirsch, B. E. Z. xxvi. p. 124.

Scymnus arcuatus, Rossi: larva described, it is very destructive to *Aphis lanigera*, &c.; Rey, Ann. Soc. L. Lyon (2) xxviii. pp. 131–133. *S. minimus*, Payk.; Bedel remarks that the transformations have been recorded by Rouget; Bull. Soc. Ent. Fr. (6) ii. p. cxlv. *S. redtenbacheri*, Muls., noticed as new to Britain, and compared with other species of the genus; Fowler, Ent. M. M. xix. pp. 67 & 68.

Cnoodes abendrothi, Kirsch, and *Scymnus apicalis*, Muls., are distinct; Kirsch, B. E. Z. xxvi. p. 124.

Epilachna, sp. Abnormal specimen from Bogota; Gadeau de Kerville, Bull. Soc. Ent. Fr. (6) ii. pp. lxxii. & lxxiii. *E. buckleyi*, Crotch, figured by Waterhouse, Aid. i. pl. lxxxvi.

New species:—

Coccinella (*Bulæa*) *nevilli*, Dohrn, S. E. Z. xliii. p. 374, Nepal.

Scymnus major, Costa, Atti Acc. Nap. ix. (11) p. 32, Sardinia.

Pharus semiglobosus, Karsch, B. E. Z. xxvi. p. 401, pl. iv. fig. 13, Chinchoxo.

Lithophilus hæmorrhous, Solsky, Troudy Ent. Ross. xiii. p. 83, Samarcand, Sarafschan.

Epilachna amœna, Karsch, *l. c.* p. 402, pl. iv. fig. 15, Chinchoxo.

HYMENOPTERA.

BY

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

The General Subject.

André, E. Species des Hyménoptères d'Europe et d'Algérie. 12me–15me Fasc. (i. pp. 597–644, ii. pp. 49–280, pls. v.–xii., and expl. pls. v.–xviii.)

The completion of Vol. i. includes Errata, Addenda et Corrigenda, alphabetical list of plants attacked by saw-flies; and general index. The portion of Vol. ii. (Ants) now published includes the remainder of the Introduction (treating of nests, larvæ, habits, Aphides, and geographical distribution), Bibliography, table of families, and the systematic portion of the work from *Camponotus* to *Strongylognathus*. One new genus and species are described. The *Formicidæ* are subdivided into *Camponotidæ* and *Dolichoderidæ*; the *Poneridæ* into *Odontomachidæ* and *Poneridæ*; the *Dorylidæ* are not subdivided; and the *Myrmicidæ* are subdivided into *Myrmicidæ* and *Cryptoceridæ*. (Cf. Girard, Le Nat. ii. pp. 63, 64, 102-104, 142, 143, 174, & 175.)

Brischke, C. G. A. Die Pflanzen-Deformationen (Gallen) und ihre Erzeuger in Danzig's Umgebung. Schr. Ges. Danz. (2) v. (3) pp. 185–199.

Lists of plants, galls, and parasites (*Cynipidæ* and *Chalcididæ*).

Frei-Gessner, E., Kohl, F., & Kriechbaumer, J. Die Typen zu Jurine's Werk: Nouvelle Methode de classer les Hyménoptères et les Diptères. MT. schw. ent. Ges. vi. pp. 387–396.

An important contribution to the synonymy of *Hymenoptera*, but not admitting of abridgment.

Inchbald, P. [See *Insecta*, General Subject.]

Krancher, O. Der Bau der Stigmen bei den Aculeaten, mit besonderer Berücksichtigung derjenigen von *Apis mellifica*. Deutsch. Bienenfreund, 1882, No. 2.

[Not seen by the Recorder.]

Magretti, P. Sugli Imenotteri della Lombardia. Memoria II. Bull. Ent. Ital. xiv. pp. 157–190, 269–301, 382, & 383.

Includes *Tenthredinidæ*, *Cynipidæ*, and *Evaniidæ*.

Mocsáry, A. Literatura Hymenopterorum. Term. füzetek, vi.; also separate, pp. 122.

A useful and approximately complete Bibliography of the Order.

——. A Magyar Fauna másnejii darázsai (*Heterogynidæ* Faunæ Hungaricæ). Term. közlem. xvii. pp. 1–93, pls. ii.

No new species is described. *Pristocera*, Klug, is separated from the *Sapygina* as a new sub-family (*Pristocerina*), on account of the apterous ♀. An abstract of the paper is given in Latin, with characters of the families and sub-families, and descriptions of *Myrmosa ephippium*, Jur., *Pristocera depressa*, Fabr., and *Tiphia morio*, Fabr. Pl. i. figs. 1 & 2, represent the sexes of *P. depressa*; the other figures represent neuration of genera.

Müller, G. F. Bidrag till Kännedomen om Parasitlifvet i Galläpplen och dylika Bildningar. Ent. Tidskr. iii. pp. 182–186.

List of *Hymenoptera* bred from galls from 1869 to 1882.

Müller, H. Sir John Lubbock's Untersuchungen über Ameisen, Bienen und Wespen. Kosmos, xi. pp. 414–425.

——. Nachträgliche Beurtheilung der von Sir John Lubbock angewandten Methode, die Farbenliebhaberei der Honigbiene zu bestimmen. *L. c.* pp. 426–429.

Provancher, L. Faune Canadienne. Nat. Canad. xiii. pp. 4–15, 33–51, 65–81, 97–110, 129–144, 161–175, 193–209, 225–242, 257–269, 289–311, 321–336, 353–368.

Extends from *Scoliidæ* to *Apidæ*, with additions and corrections to previously discussed families.

Radoszkovsky, M. O. Hyménoptères d'Angola au Muséum de Lisbonne. J. Sci. Lisb. viii. pp. 197–221 [1881].

Includes 131 species, 33 new.

Rückschritte in der Blumentüchtigkeit durch Verlust der Flügel und durch Zersplitterung der Nahrungserwerbe-Thätigkeit auf verschiedenartige Bezugsquellen (Ameisen). Ent. Nachr. viii. pp. 233–237.

The anonymous author regards the *Fossores* as the original stock of the ants, wasps, and bees, and discusses the action of ants, &c., in the fertilization of flowers.

Saunders, E. Synopsis of British *Hymenoptera*, *Diploptera*, and *Anthophila*: Part i. to end of *Andrenidæ*. Tr. E. Soc. 1882, pp. 165–290, pls. vii.–xi.

Since Smith's catalogues of these tribes, 3 new *Diploptera* and 11 new *Andrenidæ* have been added; but 23 *Andrenidæ* are rejected as being either doubtful British species or stylopised forms, broods, sexes, or races of previously known species. The genera are tabulated, and the species described in full; the plates represent the armature, ventral segments, &c., of various species of *Andrenidæ*.

Wachtl, F. A. Beiträge zur Kenntniss der Biologie, Systematik und Synonymie der Forstinsecten. ii. Die stahlblaue Fichten- und die violette Kiefern-Holzwespe (*Sirex juvencus* and *noctilio*). Centralbl. Forstwesen Wien, vii. pp. 352–359, woodcuts.

Relates to *Sirex gigas*, Linn., *noctilio*, Fabr. (= *melanocerus*, Thoms.), and their parasites, *Ibalia cultellator* and *Rhyssa persuasoria*.

Lubbock's Ants, Bees, and Wasps reviewed; Romanes, Nature, xxvi. pp. 121–123, who questions the accuracy of some of Lubbock's conclusions on the character of the vision of insects; *cf.* also Am. Nat. xvi. pp. 804–807, and Graber, Biol. Centralbl. ii. pp. 109–117.

Note on Coleopterous larvæ and their Hymenopterous parasites; Froment, CR. Ent. Belg. xxvi. pp. cv. & cvi.

Gradl publishes a catalogue of European *Tenthredinidæ* and *Siricidæ*, compiled from André's work; Ent. Nachr. viii. pp. 129–155.

Additions and corrections to the list of *Hymenoptera* of Norfolk (*Chrysididæ* and *Aculeata*); Bridgman, Tr. Norw. Soc. iii. pp. 367 & 368.

Captures of rare British *Hymenoptera*: Rothney, Ent. M. M. xviii. p. 262; at Deal in July and August, 1882; Saunders, *op. cit.* xix. pp. 86 & 87.

List of *Hymenoptera* collected in Sicily; Magretti, Nat. Sicil. i. pp. 158–162.

List of *Hymenoptera Aculeata* captured at Hermannstadt in 1881; Henrich, Verh. siebenb. Ver. xxxii. pp. 122–125.

Apidæ.

Müller, W. H. Proterandrie der Bienen. Inaugural-Dissertation zur Erlangung der philosophischen Doctorwürde der hohen philosophischen Facultät der Universität Jena. Leignitz: 1882. (*Cf.* Dimmock, Psyche, iii. pp. 381 & 382.)

In all the chief groups of bees, except the social bees, the males generally appear before the females.

Saunders, E. On the terminal ventral segments of the abdomen in *Prosopis* and other *Anthophila*. Tr. E. Soc. 1882, pp. 109–111, pl. vi.

The seventh and eighth ventral plates are quite distinct from the genital armature, of which they are frequently considered to form part; they differ much in different species; and figures of them in 8 species of *Prosopis* are given.

Schmiedeknecht, H. L. O. Apidæ Europææ (Die Bienen Europa's) per Genera, Species, et Varietates dispositæ. Fasc. i.–iv. 1882, 8vo, pp. vi. 1*–36* & 1–314, pls. i.–ix.

The portion already published comprises a general introduction, with tables of families and genera, and the systematic portion relating to the genus *Nomada*, and the commencement of *Bombus*. The plates represent structural details only. A double pagination is given under the genera, one referring to the book, and the second to the genus only.

The former is here quoted. The author's general arrangement is as follows:—

Sectio I. Apidæ sociales.
- A. Sociales permanentes . . . . . *Apidæ.*
- B. Sociales unius anni . . . . . *Bombidæ.*

Sectio II. Apidæ solitariæ cellulas construentes.
- A. Podilegidæ (Scopulipedes).
  - *a.* Crurilegidæ . . . . . *Anthophoridæ, Melittidæ.*
  - *b.* Femorilegidæ . . *Xylocopidæ, Panurgidæ, Andrenidæ.*
- B. Gastrilegidæ (Dasygastræ) . . . . . *Megachilidæ.*
- C. Pseudoparasitæ . . . . . *Sphecodidæ, Prosopidæ.*

Sectio III. Apidæ parasiticæ.
- A. Inquilinæ sive commensales . . . . *Psithyridæ.*
- B. Apidæ parasiticæ veræ sive solitariæ . . *Melectidæ, Stelidæ.*

The descriptions of species and varieties appear to be very complete. In the tables of *Bombus* the species of *Psithyrus* are included.

Colletes picistigma, Thoms., *Halictus brevicornis*, Schrank, and *Epeolus productus*, Thoms, recorded as new to Britain, and redescribed; Saunders, Ent. M. M. xviii. pp. 199 & 200.

Captures of spring bees at Hastings; *id. op. cit.* xix. p. 20.

Catalogue of the Bees of Esthonia, Livonia, and Curland; Sagemehl, Arch. Nat. Liv. (2) viii. pp. 451-466.

Andrenides.

Hagens, D. von. Ueber die männlichen Genitalien der Bienen-Gattung *Sphecodes*. Deutsche E. Z. xxvi. pp. 209–228, pls. vi. & vii.

The primary and secondary sexual characters of each species are briefly but carefully described, and figures are given of the extremity of the abdomen of the ♂ in 26 species. The following synonymy is given:—*S. fuscipennis*, Germ. (= *latreillii*, Wesm., *nigripes*, Lep., and *rugosus*, Smith), *scabricollis*, Wesm. (♀ = *varispinis*, Först.), *spinulosus*, Hag. (= *canus*, Först.), *gibbus*, Linn. (= *rufus*, Chr., *sphecoides*, *monilicornis*, and *piceus*, Kirby), *subquadratus*, Smith (= *gibbus*, Wesm.), *suboralis*, Schenck (= *brevis*, Hag.), *rubicundus*, Hag. (= *rufiventris*, Panz. *nec* Först., *leucotrichus*, Först., and *ambiguus*, Schenck), *pilifrons*, Thoms. (= *brevicornis*, Hag., and *scalis*, Först.), *similis*, Wesm. (= *rufescens*, Fourcr., *gibbus*, Chr., *pellucidus*, Smith, and *analis*, Ill.), *ferruginatus*, Schenck (= *rufescens*, pt., Hag.), *hyalinatus*, Schenck (= *rufescens*, pt., Hag.), *punctiseps*, Thoms. (= *ephippius*, Hag., *inermis* and *genuinus*, Först.), *niger*, Sich. (= *carbonarius* and *dispar*, Först.).

Notes on *Andrenidæ* and *Strepsiptera*; Brandt, Troudy Ent. Ross. xiii. pp. v. & vi.

Sphecodes. British species tabulated; *S. rufiventris*, Smith, *nec* Wesm., = *pilifrons*, Thoms.; *S. similis*, Wesm., and *punctiseps*, Thoms., are recorded as new to Britain; Saunders, Ent. M. M. xviii. p. 198.

Halictus cylindricus carnivorous; Parfitt, *op. cit.* xix. pp. 162 & 163.

Andrena bimaculata, Lep., redescribed in both sexes; De Stefani

Perez, Nat. Sicil. i. pp. 156 & 157. *A. pratensis*, Nyl. (= *ovina*, Klug): habits and parasites; Friese, Ent. Nachr. viii. pp. 317–319.

Macropis labiata, Fabr., flight noticed; Enock, Tr. E. Soc. 1882, p. xv.

New species :—

Sphecodes schenckii (= *rufiventris*, Schenck, *nec* Panz.), p. 217, *divisus*, *minutus*, *emarginatus* (= *egregius*, Först.), p. 223, *dimidiatus*, *fasciatus*, *affinis*, *atratus*, p. 224, *nigritulus*, Hag., p. 225, *nitidulus*, *longulus* (= *edentatus*, Först.), p. 226, Von Hagens, Deutsche E. Z. xxvi., Germany.

Halictus distinctus, 6-*cinctus*, *scabrosus*, p. 200, *constrictus*, p. 202, and *ontariensis*, p. 203, Provancher, Nat. Canad. xiii., Canada.

Dasypoda leucoura [*leucura*], Rudow, Ent. Nachr. viii. p. 279, Perleberg.

Apides.

Cook, A. J. How the Bee extends its Tongue. P. Am. Ass. xxx. pp. 276–278, woodcuts.

The ligula is essentially a tube, but there is a slit below which can be opened at pleasure. Its extension is produced by the liquid secretion from four large glands, two in the head and two in the thorax, being forced into the tubular sheath of the ligula.

Dalla Torre, K. W. v. Bemerkungen zur Gattung *Bombus*, Latr., ii. Ber. Ver. Innsbr. xii. pp. 14–31.

33 species are enumerated. The genus *Bombus* is divided into the following sections, which (except *Poecilobombus*) are not characterized :— *Rhodobombus* (p. 14, for *alpinus*, F., &c.), *Melanobombus* (p. 17, for *ruderarius*, Müll., &c.), *Kallobombus* (p. 19, for *mendax*, Gerst., &c.), *Poecilobombus* (p. 23, for *steveni*, Rad., &c.), *Thoracobombus* (p. 24, for *equestris*, Drews., &c.), *Leucobombus* (p. 26, for *terrestris*, L., &c.), *Pyrrhobombus* (p. 28, for *gerstaeckeri*, Mor., &c.), and *Chromobombus* (p. 29, for *muscorum*, L., &c.)

B. (*Leucobombus*) *terrestris* varr. *dalmatinus*, E. Europe and W. Asia, and *kristophi*, Graz, p. 26, *B.* (*Chromobombus*) *muscorum* varr. *corsicus*, Corsica, *staudingeri*, W. Siberia, and *longicornis*, Amur, p. 30, and *B.* (*C.*) *variabilis*, Schmied., var. *aurantiacus*, S. Europe, p. 31, described; Dalla Torre, *l. c.*

Gronen, D. Zur Naturgeschichte der Meliponiden. Zool. Gart. xxii. pp. 330–333; *cf.* also S. E. Z. xliii. pp. 110–113.

Relates to architecture and honey, especially of *Melipona fasciata*, Latr.

Hoffer, E. Biologische Beobachtungen an Hummeln und Schmarotzer-Hummeln. MT. Ver. Steierm. 1881, pp. 68–92; *cf.* Ent. Nachr. viii. pp. 178–186; also H. Müller, Kosmos, xii. pp. 155–158.

Includes remarks on the oviposition of *Bombi*; the old queen lays eggs which produce all sexes; those of the so-called small ♀♀ produce only females and workers; habits of drones; the trumpeter, who rouses the nests in the morning; mixed nests of *Bombi*, containing more than one species; and habits of *Apathus* (*Psithyrus*) *campestris*, Panz.

[Hoffer, E.] Beschreibung eines instructiven Nestes von *Bombus confusus*, Schenck. *L. c.* pp. 93–105, plate.

The sexes and their variations are fully described.

——. Die Hummeln Steiermarks. Lebensgeschichte und Beschreibung derselben. JB. steierm. Landes-Oberrealschule zu Graz (also separate) pp. 92, 1 plain and 2 coloured pls.; abstract, Ent. Nachr. viii. pp. 253–260; *cf.* also H. Müller, Kosmos, xii. pp. 155–158.

——. Verzeichniss der in der Umgebung von Graz vorkommenden Hummelarten. MT. Ver. Steierm. 1881, pp. 106–109.

18 species of *Bombus* recorded.

Apis, *Melipona*, and *Trigona* carnivorous; H. Müller & Mason, Am. Nat. xvi. p. 681.

Osmia cœrulescens, Latr. & Gir. (*nec* Kirby) noticed; Saunders, Ent. M. M. xviii. p. 169.

Chalicodoma. Parasites noticed; Rudow, Ent. Nachr. viii. p. 279. *C. luctuosa*, Dours, noticed; Costa, Atti Acc. Nap. ix. (6) p. 44.

Megachile, sp. destructive to brightly-coloured garden flowers in America; Murtfeldt, Psyche, iii. p. 343.

Anthidium sticticum makes its nests in snail-shells in Algeria; Lucas, Bull. Soc. Ent. Fr. (6) ii. pp. cxix. & cxx.

Nomada bifida, Thoms., and *guttulata*, Schenck, recorded as new to Britain; Saunders, *l. c.* xix. pp. 45 & 46.

Anthophora acervorum noticed; Parfitt, *op. cit.* p. 163.

Xylocopa, sp. perforating the corolla of a *Petunia*; Mann & Murtfeldt, Psyche, iii. pp. 298 & 343.

Psithyrus, sp. n. (?) or *saltuum*, var. (?) from Italy described; Gribodo, Ann. Ent. Ital. xiv. p. 81.

Humble bee's nest in a can of cart-grease; Lett, Sci. Goss. xviii. p. 237.

Bombus. Synopsis of species of the Argentine Republic (*B. violaceus*, Lep., *thoracicus*, Sich., *caiannensis*, Fabr., and *dahlbomi*, Guér.; Holmberg, An. Soc. Arg. viii. [1879] pp. 154–162.

Bombus montanus, Lep. Schmiedeknecht refers to the confusion which has occurred in the identification of this species; Ent. Nachr. viii. pp. 21 & 22.

Melipona. See Dewitz, H. (*Insecta*, General Subject.)

Apis mellifica, var. *nigrita* from France, &c., noticed; Lucas, Bull. Soc. Ent. Fr. (6) ii. p. lxii.

Apis mellifica. Parthenogenesis, fertile workers, &c., are errors; Ulivi, Scientific American, March 25, 1882, and Am. Nat. xvi. pp. 680 & 681. On the senses of bees; Lubbock, Nature, xxvii. p. 46. The neighbourhood of beehives is very attractive to other insects, including *Bombi*; J. A. Smith, Sci. Goss. xviii. pp. 20 & 21 (*cf.* also p. 65). Beehives entered by *Acherontia atropos* and *Sphinx ligustri*; Katter, Ent. Nachr. viii. pp. 319 & 320. Bees destroyed by *Eucalyptus* flowers; Girard, Bull. Soc. Ent. Fr. (6) ii. pp. cxviii. & cxix.

Notes on Syrian bees; A. J. Cook, P. Am. Ass. xxx. pp. 273–276.

New genera and species :—

Gnathocera, Provancher, Nat. Canad. xiii. p. 232. Allied to *Megachile*, head strongly excavated behind, jaws dilated, and produced below into an appendage which is entire above and excavated beneath ; type, *G. cephalica*, sp. n., *l. c.* p. 233, Canada.

Panurgus perezi, Saunders, Ent. M. M. xviii. p. 169, fig., Portugal ; *P. vernalis* and *æstivalis*, Provancher, Nat. Canad. xiii. pp. 204 & 205, Canada.

Osmia lignicola, id. *l. c.* p. 208, Canada ; *O. igneo-purpurea*, Costa, Rend. Acc. Nap. xxi. p. 198, note, Sardinia, Algeria.

Megachile carinulata, id. *l. c.*, Sardinia ; *M. pallida*, *decem-signata*, and *unifasciata*, Radoszkovsky, J. Sci. Lisb. viii. p. 201, Angola ; *M. simplex* and *oblonga*, Provancher, *l. c.* pp. 229 & 230, Canada.

Ceratina bidentata, id. *l. c.* p. 234, Canada.

Nomada festiva, Italy, p. 77, *confinis* (Kriechb., MS.), S. Europe, p. 90, *arrogans*, Greece, p. 95, *gribodoi*, Italy, p. 96, *imperialis*, Greece, p. 99, *incisa*, Istria, Sicily, p. 101, *frey-gessneri*, Valais, S. France, p. 102, *speciosissima*, Hungary, p. 103, *illustris*, Italy, p. 104, *verna* (Mocs., MS.), Hungary, p. 110, *mephisto*, Dalmatia, Sarepta, p. 117, *discrepans*, S. Switzerland, p. 119, *trispinosa* (*melanostoma*, Thoms., ? Herr.-Schäff.), S. Europe, p. 121, *andalusica*, p. 124, *blepharipes*, p. 127, *insignipes*, S. Europe, p. 128, *cal*[*l*]*imorpha* (Mocs., MS.), S. Europe, p. 131, *mocsarii* (? = *amabilis*, Rad.), S. E. Europe, p. 133, *sybarita* (Mocs., MS.), Hungary, p. 134, *scita* (Mocs., MS.), Hungary, Russia, p. 135, *melanopyga* (Mocs., MS.), Hungary, p. 139, *pallide-notata*, S. Russia, p. 140, *braunsiana*, S. and Central Europe, p. 144, *dira* (Mocs., MS.), S. Europe, p. 153, *cruenta* (Mocs., MS.), p. 170, *schmiedeknechti* (Mocs., MS.), Hungary, S. Russia, p. 172, *longiceps*, Hungary, p. 173, *propinqua*, S. Europe, p. 174, *olympica*, Olympus, S. France, p. 176, *balteata* (Mocs., MS.), Hungary, p. 185, *dalla-torreana*, Germany, Austro-Hungary, Italy, p. 194, *carniolica*, Carniola, p. 196, *concolor*, Sicily, p. 201, *kohli*, S. Europe, p. 203, *julliani*, Marseilles, Switzerland, p. 208, *corcyræa*, Corfu, Leghorn, p. 219, *transitoria*, S. Russia, Spain, p. 222, *helvetica*, Switzerland, S. France, p. 225, *thersites*, Sarepta, p. 227, *nausicaa*, Corfu, Bordeaux, p. 228, *nigro-antennata*, Spain, p. 230, *lævilabris*, S. France, p. 231, *krueperi*, Greece, p. 232, *eos*, Greece, Spain, p. 233, *austriaca* (Mocs., MS.), Austria, p. 238, *brevicornis* (Mocs., MS.), S. and Central Europe, p. 241, *glaberrima*, Greece, Dalmatia, p. 246, Schmiedeknecht, Ap. Eur. i.

Eucera cornuta and *albigena*, De Stefani Perez, Nat. Sicil. i. pp. 155 & 156, Sicily ; *E. nuda*, Provancher, *l. c.* p. 174, Canada.

Anthophora thomsoni, Saunders, *l. c.* p. 171, Portugal ; *A. atriceps*, Radoszkovsky, *l. c.* p. 198, Angola.

Xylocopa mixta, id. *l. c.* p. 199, Angola.

Bombus (*Melanobombus*) *paradoxus* (? = *confusus*, Schenk, var.), Hungary, p. 18, *B.* (*Kallobombus*) *parnassius* (? = *niveatus*, Kriechb., var.), *B.* (*K.*) *rogenhoferi*, Sicily, p. 22 ; Dalla Torre, Ber. Ver. Innsbr. xii.

Bombus persicus, Radoszkovsky, Hor. Ent. Ross. xvi. p. v. Troudy Ent. Ross. xii. p. lvi., Demavend.

VESPIDÆ.

MAINDRON, M. Histoire des Guêpes solitaires (Euméniens) de l'Archipel Indien et de la Nouvelle-Guinée. Ann. Soc. Ent. Fr. (6) ii. pp. 69–76, 169–188, & 267–286, pls. iii.–v.

This paper contains a summary of the observations of previous authors on the habits of the *Eumenides*, and general observations on nidification, habits, &c. They may be divided into three groups, according to their nidification:—(1) *Eumenes*, *Zethus*, *Abispa*, *Rhynchium*, and *Synagris*: nests formed of comminuted earth, and fixed to walls, stones, brambles, or to the branches of shrubs. (2) *Odynerus*, and allies, *Discelius* (?): nests formed in galleries dug in old walls, or [illegible] ground. (3) *Odynerus*, *Rhynchium*: nests excavated in dry [illegible]ies. Next follows a description of the habits of the larvæ and pu[illegible], and this paper concludes with a list of the species of the Indo-Malayan and Papuan Islands, several being described as new. Much synonymy is given. Nests, &c., of the following known species are figured:—*Eumenes cincinalis*, Fabr., pl. iii. figs. 7–10, [illegible] figs. 1–5, *Rhynchium parentissimum*, [illegible] & 9, [illegible], Fabr., figs. 10 & 11, pl. iv., *atrum*, Sauss., figs. 8 & 9, and *rubro-pictum*, Smith, figs. 10 & 11, pl. v.

Mummy of a wasp; Psyche, iii. p. 368.

Polistes gallica and *biglumis*, L., discussed; De Stefani Perez, Nat. Sicil. ii. pp. 55–58.

Odynerus pictus, Curt. Transformations noticed; Bignell, Ent. xv. p. 164.

Vespa germanica. Early appearance in 1882; Billups, P. E. Soc. 1882, p. iii., and Ent. M. M. xviii. p. 234. *V. occidentalis*, Cress., preying on *Musca domestica*; Snow, Psyche, iii. p. 339. *V. orientalis*, Fabr., discussed; De Stefani Perez, Nat. Sicil. ii. pp. 17–20, & 42–44.

The larvæ of wasps emit fluid from the mouth, and take it up again accompanied by any nutritious particles which it may have enclosed; Wake, J. Northampton Soc. i. p. 59.

Wasps and hornets attack flies and bees, and reject the heads of flies; they also stalk down grasshoppers; Sci. Goss. xviii. pp. 237, 261, 281, & 282.

New species:—

Eumenes dorycus, figs. 3–6, New Guinea, and *dichrous*, figs. 1 & 2, Tidore, Maindron, Ann. Soc. Ent. Fr. (6) ii. pp. 273 & 274, pl. iii.

Ancistrocerus lucasius, id. *l. c.* p. 282, pl. iii. fig. 11, New Guinea.

Icaria maculata, Radoszkovsky, J. Sci. Lisb. viii. p. 204, Angola.

Odynerus angolensis, *obscurus*, p. 204, *humbii*, p. 205, *id. l. c.*, Angola; *O. bicolor*, Maindron *l. c.* p. 284, pl. iv. figs 6 & 7, New Guinea; *O. ponticericinus*, id. Bull. Soc. Ent. Fr. (6) ii. p. xv., Pondicherry; *O.* (*Lionotus*) *laborans*, Costa, Atti Acc. Nap. ix. (11) p. 37, Sardinia.

Rynchium medium (? = *nitidulum*, Sauss., var.), figs. 1–5, and *kuenckeli*, figs. 5 & 6, Maindron, *l. c.* pp. 278 & 279, pl. v., New Guinea; *R. ferrugineum*, p. 205, *holosericeum*, and *rufiventre*, p. 206, Radoszkovsky, *l. c.*

Crabronidæ.

Pompilides.

Costa, A. Fauna del Regno di Napoli. Fasc. 118, Napoli: 1881 (text dated 1874), *Hymenoptera*: *Pompilidei*, pp. 25–40, pls. vii. bis & viii.

The following known species are redescribed:—*Pompilus plumbeus*, Fabr., p. 25, *melanarius*, Dahlb., p. 26, *niger*, Fabr., *stygius*, Klug, p. 27, *hæmatopus*, St. Farg., fig. 2, *dimidiatus*, Fabr., fig. 3, p. 28, *rufipes*, Dahlb., p. 30, *albo-notatus*, Wesm., p. 31, *quadripunctatus*, Fabr., p. 32, *aterrimus*, Rossi, *tropicus*, Fabr., fig. 6, pl. vii. bis, p. 33, *vagans*, Klug (= *orbitalis*, Costa, *olim*), p. 34, *viaticus*, Scop., *fumipennis*, Dahlb., p. 35, *dispar*, *spissus*, Dahlb., p. 36, *gibbus*, Fabr., *vomericentris*, Costa, p. 37, and *Ferreola algira*, St. Farg., pl. vii. bis, fig. 4.

Holmberg, E. L. Sobre las especies Argentinas del género *Pompilus*. An. Soc. Arg. xii. [1881] pp. 131–144, 173–280.

29 species enumerated, many new.

Pompilus fraterculus, Otranto, p. 25, *funeripes*, pl. vii. bis, fig. 5, Naples, *bicingulatus*, fig. 2, Alburno, p. 34, *nubeculo*, fig. 4, pl. viii. fig. 38, Costa, l. c.; *P. argyrolepis*, p. 35, *meticulosus* and *holoxanthus*, p. 36, *id.* Atti Acc. Nap. ix. (11); *P. rufithorax*, id. *op. cit.* ix. 6, p. 40, fig. 12, Calabria; *P. erubescens* (Tasch., MS.), p. 134, *pampeanus*, *barbarus*, p. 135, *insularis*, *marginicollis* (Tasch., MS.), p. 136, *torquatus* (Tasch., MS.), *diabolicus*, p. 137, *taschenbergi* (= *semiplumbeus*, ♂, Tasch.), p. 138, *sublimatus*, p. 139, *tucumanus*, p. 140, *correntinus*, p. 141, *bergi*, p. 142, *satanas*, p. 143, *adustus* (Tasch., MS.), *guentheri*, p. 144, *trochilinus*, p. 274, *cæruleus*, *cujanus*, p. 275, *insidiosus*, p. 276, *autumnalis*, *lynchi*, p. 277, Holmberg, l. c.: *P. griseus*, p. 36, *apicatus*, p. 38, *castaneus*, p. 39, Provancher, Nat. Canad. xiii. Canada; *P. africanus*, *carinatus*, and *mixtus*, Radoszkovsky, J. Sci. Lisb. viii. pp. 211–213, Angola.

Agenia perfecta, Provancher, *l. c.* p. 44, Canada.

Ferreola thoracica, Costa, Faun. Nap. *Pom.* p. 40, pl. viii. fig. 3, Naples.

Priocnemis leucocœlius and *bis-decoratus*, id. Rend. Acc. Nap. xxi. p. 197, note; *P. perligerus*, id. Atti Acc. Nap. ix. 11, p. 35, Sardinia; *P. ophthalmicus*, id. *tom. cit.* 6, p. 39, fig. 11, Calabria; *P. anchieta*, Radoszkovsky, *l. c.* p. 213, Angola.

Ceropales bifasciata, id. *l. c.* p. 214, Angola.

Pepsis unifasciata, id. *l. c.*, Angola.

Planiceps fulvicentris, Costa, Rend. Acc. Nap. xxi. p. 197, Sardinia.

Evagetes servillii, id. Atti Acc. Nap. ix. 11, p. 36, Sardinia.

Sphegides.

Psammophila ebenina, Spin., noticed; Costa, Atti Acc. Nap. ix. 11, p. 34.

Sphex luteifrons, p. 208, *vagus* and *cyanescens*, p. 209, spp. [illegible] kovsky, J. Sci. Lisb. viii., Angola.

Larrides.

Tachytes, sp. n., from Pollino noticed; Gribodo, Bull. Ent. Ital. xiv. p. 82. *T. rufiventris*, Spin., noticed; Costa, Atti Acc. Nap. ix. 11, p. 34.

New species :—

Nothytes erythrogastra and *procera*, id. Rend. Acc. Nap. xxi. p. 197, Sardinia ; *T. capitalis*, Radoszkovsky, J. Sci. Lisb. viii. p. 210, Angola.

Liris brunneipes, Cresson, Tr. Am. Ent. Soc. ix. p. iii. Colorado, Nevada.

Astata occidentalis, Washington Territory, p. iii. *nigro-pilosa*, Colorado, Nevada, *cærulea*, Nevada, p. iv. *mexicana*, Mexico, *nevadica*, Nevada, *montana*, Colorada, Nevada, p. v., *elegans*, Washington Territory, Vancouver's Island, Nevada, Colorado, *bella*, San Diego, California, p. vi. ; *id. l. c.*

Bembicides.

Bembex geneana, sp. n., Costa, Atti Acc. Nap. ix. (11) p. 34, Sardinia.

Nyssonides.

Cresson, E. T. Descriptions of Species belonging to the Genus *Nysson* inhabiting North America. Tr. Am. Ent. Soc. ix. pp. 273–284.

The known species redescribed are *Paranysson armatus* and *texanus*, Cress., *Nysson aurinotus* and *quinquespinosus*, Say, *æqualis*, Patt., *opulentus*, Gerst., and *lateralis*, Pack., the rest are new.

Hoplisus bicinctus, Rossi. Amended description ; Bignell, Ent. xv. p. 287 ; *cf.* also Ent. M. M. xix. p. 163.

Hyponysson, g. n., Cresson, *l. c.* p. 273. Subgenus of *Nysson* with only two submarginal cells; type, *H. bicolor*, sp. n., *l. c.* p. 284, Washington Territory.

New species :—

Paranysson fuscipes, Washington Territory, Oregon, and *mexicanus*, Mexico, *id. l. c.* pp. 274 & 275.

Nysson plagiatus (= *aurinotus*, Pack., *nec* Say), Illinois, Nebraska, Washington Territory, p. 276, *compactus*, Washington Territory, *albomarginatus*, Nevada, p. 278, *aztecus*, Mexico, *mellipes*, Colorado, Dakota, Montana, p. 279, *zapotecus*, Mexico, *mœstus*, Washington Territory, *bellus*, Montana, Texas, p. 280, *basilaris*, Georgia, *tristis*, Washington Territory, p. 281, *fidelis*, Montana, Colorado, *rusticus*, Washington Territory, p. 282, *ruficentris*, Montana, Colorado, *pumilus*, Nevada, p. 283, *id. l. c.*

Larra quebecensis, Provancher, Nat. Canad. xiii. p. 50, Canada.

Mellinus abdominalis, Cresson, *l. c.* p. xxxix., Montana.

Lestiphorus africanus, Radoszkovsky, J. Sci. Lisb. viii. p. 207, Angola.

Stizus niger, id. *l. c.* p. 208, Angola.

Crabronides.

Crabro fossorius dragging an *Asilus* into its hole ; Waga, Le Nat. ii. p. 46. *C. gonager*, ♀ noticed ; Perkins, Ent. M. M. xix. p. 100.

Cerceris. Supposed new species from Sicily described ; Magretti, Nat. Sicil. i. p. 160.

Eucerceris, Cress., catalogued, and the sexes separately tabulated; Cresson, Tr. Am. Ent. Soc. x. pp. v.–viii.

Alcpidaspis, g. n., Costa, Rend. Acc. Nap. xxi. p. 197; Atti Acc. Nap. ix. 11, p. 35. Differs from *Oxybelus* in wanting the scales on the side of the scutellum; type, *A. diphyllus*, sp. n., *ll. cc.*, Sardinia.

Crabro 4-maculatus and *aciculatus*, spp. nn., Provancher, Nat. Canad. xiii. pp. 102 & 108, Canada.

Blepharipes cinctipes, id. *l. c.* p. 133, Canada.

Oxybelus polyacanthus, sp. n., Costa, Rend. Acc. Nap. xxi. p. 197, Sardinia.

Cerceris bucculata, sp. n., *id.*, Atti Acc. Nap. ix. 11, p. 35, Sardinia, Naples.

Eucerceris montanus and *bicolor*, spp. nn., Cresson, Tr. Am. Ent. Soc. ix. pp. viii. & xxxviii., Montana.

Scoliides.

Ischiocerus, g. n., Provancher, Nat. Canad. xiii. p. 8. Differs from *Tiphia* in the neuration, and in the mucronated hind tibiæ of ♀; type, *I. rugosa*, sp. n., *ibid.*, Canada.

Scolia unicincta, sp. n., *id. l. c.* p. 6, Canada.

Elis (*Trielis*) *hybrida*, sp. n., Costa, Atti Acc. Nap. ix. 11, p. 36, Sardinia.

Discolia olivierii, sp. n., Radoszkovsky, J. Sci. Lisb. viii. p. 215, Angola.

Sapygides.

Sapyga maculata, sp. n., Provancher, Nat. Canad. xiii. p. 9, Canada.

Mutillidæ.

Mutilla diophthalma, Costa, Atti Acc. Nap. ix. 11, p. 37, Sardinia. *M. aureo-picta*, p. 215, *humbii* and *anchietæ*, p. 216, *conferata* and *tripunctata*, p. 217, and *cuneata*, p. 218, Radoszkovsky, J. Sci. Lisb. viii., Angola, spp. nn.

Formicidæ.

André, E. [See *Hymenoptera*, General Subject.]

Ihering, H. von. Über Schichtenbildung durch Ameisen. (*Atta cephalotes*) Briefliche Mittheilung aus Mundo-novo, Prov. Rio grande do Sul, Brasilien, Oct. 1881. Neues JB. Mineral. 1882, i. pp. 156 & 157.

Lubbock, J. Observations on the Habits of Ants. Ent. xv. pp. 33–36, 85–88.

Relates to the identification of companions; the progressive degradation of slave-making ants, *Formica*, *Polyergus*, *Strongylognathus*, and *Anergates*; recognition of relations; peculiarities of manner in different species; longevity. [*Cf.* also Ent. Nachr. viii. pp. 263–265.]

McCook, H. C. The Honey Ants of the Garden of the Gods, and the Occident Ants of the American Plains. A monograph of the architecture and habits of the honey-bearing Ant, *Myrmecocystus melliger*, with notes upon the anatomy and physiology of the alimentary canal; together with a natural history of the Occident Harvesting Ants, or Stone-Mound Builders of the American Plains. Philadelphia: 1882, 8vo, pp. 188, pls. xiii.

The first part of this work appeared in P. Ac. Philad. 1881 (*cf.* Zool. Rec. xviii. *Ins.* p. 118); the second part, referring to *Pogonomyrmex occidentalis*, Cress., treats of its geographical distribution, architecture, habits, and armature. (For various notices by Romanes, Hagen, Emery, and others, *cf.* Nature, xxv. pp. 405–407; Ent. Nachr. viii. pp. 186–191; S. E. Z. xlii. pp. 347–352; Biol. Centralbl. ii. pp. 83–85; and Kosmos, xi. pp. 296–298.)

Reuter, O. M. Om Myrornas v. k. instinkt med särskild hänsyn till de nyaste undersökningarne rörande densamma. Öfv. Fin. Soc. xxiv. pp. 136–164.

Appears to be a compendium of Lubbock's observations on ants.

Rudolph, H. Förteckning öfver Svenska Myror. Preliminärt Meddelande. Ent. Tidskr. iii. pp. 127–151.

A synopsis of Swedish *Formicidæ*. Contains nothing new, unless the notices of two or three undetermined species may be so regarded.

Ants and *Aphides*; Osten-Sacken, Psyche, iii. p. 343.

Ants being employed in China to clear orange trees of injurious insects, McCook discusses the habits of various species, with reference to the possibility of their being used for similar purposes in America; P. Ac. Philad. 1882, pp. 263–271 (*cf.* also Riley & Tennent, Nature, xxvi. pp. 126, 159 & 160).

Two ants' nests of different species in close contiguity; Parrot, Sci. Goss. xviii. p. 237.

Sound-producing ants; Blanford, Fotheringham, & Lewis, Nature, xxv. pp. 32 & 55, xxvi. p. 266.

Edible ants; Provancher, Nat. Canad. xiii. pp. 30 & 31.

Habits of South Australian ants; Tepper, Tr. R. Soc. S. Austr. v. pp. 24–28, 106, & 107.

On fungi found in ants' nests; Gard. Chron. (2) xviii. p. 401, figs.

Formica herculeana. Nest five feet below the surface of the ground, under the roots of an oak; Guillaume, Bull. Soc. Neuch. xii. p. 499; *F. rufa* and *nigra* [sic]: a slave foray; Siewers, J. Cincinn. Soc. v. pp. 60 & 61.

Lasius flavus: marriage flight; Lucas, Bull. Soc. Ent. Fr. (6) ii. pp. clx. & clxi. *L. interjectus* herding 2 species of *Aphis* and *Coccus*; Leidy, P. Ac. Philad. 1882, pp. 148 & 149. *L. niger* clearing clothes infested with vermin; Waga, Le Nat. ii. p. 46: larvæ and pupæ of *Microdon mutabilis* (a Syrphid) occurring in its nests; Mayet, Bull. Soc. Ent. Fr. (6) ii. p. cvi.

Cremastus lineolatus, Say, constructing a shed for *Aphides*; Trelease, Psyche, iii. pp. 310 & 311.

Œcodoma. Great swarms in the Paraná ; White, "Cameos from the Silver Land," ii. pp. 437 & 438.

Œcophylla obesa radobojana, Heer, redescribed and figured from Kutschina (fossil) ; Deichmüller, Verh. L.-C. Ak. xlii. p. 325, pl. xxi. figs. 14, 15, & 15*a*.

Parasyscia, g. n., Emery, in André's Spec. Hym. ii. p. 235. *Ponerida* ; allied to *Syscia*, Roger ; ♂ and ♀ unknown; worker, eyes present ; antennæ 11-jointed. Type, *P. piochardi*, sp. n., *l. c.* p. 236, Syria.

Typhlopone clausi, sp. n., Joseph, B. E. Z. xxvi. p. 47, Carniola.

Hypoclinea kutschlinica, sp. n., Deichmüller, Verh. L.-C. Ak. xlii. p. 322, pl. xxi. fig. 13, Kutschlin (fossil).

Chrysididæ.

Heyden, L. v. Die Chrysiden oder Goldwespen aus der weiteren Umgebung von Frankfurt. Ber. senck. Ges. 1881–1882, pp. 243–255.

A list of species, with critical remarks, but apparently containing little or nothing new.

Mocsáry, A. A Magyar Fauna Fémdarázsai. A Magyar Tudományos Akadémia Altal a vitéz-fele jutalommal (1882) koszorüzott pályamü. Chrysididæ Faunæ Hungaricæ. Opus ab Academia Hungarica Scientiarum coronatum et editum. A. M. T. Akadémia, iii. Osztályának külön kiadványa, 1882, iii. Budapest: 1882, 4to, pp. 94, pls. i. & ii.

An elaborate paper, with tables of species, full synonymy, and descriptions, &c. An abstract is added in Latin, in which descriptions are given of the following known species, in addition to new ones:— *Cleptes œrosus*, Först., *Holopyga gloriosa*, Fabr., *chrysonota*, Först., *similis* and *bellipes*, Mocs. (fig. 1), *amœnula*, Dahlb., *Stilbum amethystinum*, Fabr., and var. *festivum*, Mocs., *Chrysis unicolor*, Dahlb., *venusta*, figs. 3 & 3*a*, and *placida*, fig. 4, pl. ii., Mocs., *cingulicornis*, Först., *splendidula*, Rossi, *sybarita*, Först., *scutellaris*, Fabr., and *pulchella*, Spin. The plates represent details and 4 species.

Chrysis cyanopyga, Dahlb. Parasitic on various species of *Lophyrus* ; Lamprecht, Ent. Nachr. viii. p. 253. *C. succinctula*, Spin., var. from Vulture noticed ; Gribodo, Bull. Ent. Ital. xiv. p. 83.

Chrysis carinæventris[*-niv-*], pp. 50 & 84, *frivaldszkii*, pl. ii. fig. 2, *fallax*, Budapest, pp. 52 & 85, and *cal*[*l*]*imorpha* (= *dives*, Dahlb., *nec* Luc.), Sicily, p. 71, Mocsáry, l. c.; *C. persica* and *demavendæ*, Radoszkovsky, Troudy Ent. Ross. xii. p. lvi., and Hor. Ent. Ross. xvi. p. v., Demavend.; *C. olivierii* and *angolensis*, id. J. Sci. Lisb. viii. p. 219, Angola: spp. nn.

Ichneumonidæ.

Bignell, G. C. Contributions towards the Fauna of Plymouth. *Hymenoptera* : *Ichneumonidæ*. Arranged according to T. A. Marshall's catalogue, published by the Entomological Society of London, 1872. Part ii. Rep. & Tr. Plym. Inst. viii. pp. 137–141.

Includes occasional notices of hosts.

Bridgman, J. B. Further additions to Marshall's catalogue of *Ichneumonidæ*. Tr. E. Soc. 1882, pp. 141–164.

Much synonymy is given, for which the paper itself must be consulted; several new species are described, as well as the following known species: *Hemiteles castaneus*, Tasch., ♂, *H. gyrini*, Parf., *Pezomachus anthracinus*, Först., ♂, *Limneria virginalis* and *canaliculata*, Grav., *Exochus septentrionalis*, Holmgr. (?), *Lissonota anomala*, Holmgr. (?), and *L. linearis*, Grav.

——, & Fitch, E. A. Introductory papers on *Ichneumonidæ*. Ent. xv. pp. 11–14, 78–85, 180–185, 222–228, 275–281.

Extends from *Herpestomus*, Wesm. (*Ichneumonidæ*) to *Cryptus*, Fabr. (*Cryptidæ*).

Woldstedt, F. W. Fundorte russischer Ichneumoniden. Hor. Ent. Ross. xvi. pp. 58–64.

171 species noticed, chiefly from Siberia.

Introductory paper on *Ichneumonidæ*; Walker, Naturalist, vii. pp. 63 & 64, 74–81, 98–100.

Xylonomus (*Macrophora*) *rufipes*, Grav., var., *Mesostenus grammicus*, Grav., ♂, p. 61, *Cryptus sponsor*, Fabr., var., *Amblyteles glaucatorius*, Fabr., var., p. 62, *Ichneumon centum-maculatus*, Christ., var., p. 63, *Erromenus punctulatus*, Holmgr., var., *Notopygus resplendens*, Holmgr., var., and *N. rufinus*, Grav., var., p. 64, briefly described; Woldstedt, Hor. Ent. Ross. xvi.

Ichneumonides.

Ichneumon malacus, Say, and *Phæogenes ater* parasitic on *Ægeria syringæ*; Osborn, Papilio, ii. p. 72.

Ichneumon erythræus, Grav., in association with *Formica flava*; Billups, Ent. xv. pp. 92 & 93 (Bridgman, *tom. cit.* pp. 139 & 140, states that the species is *I. sanguinator*, Rossi, and remarks on the allied species). *I. quæsitorius*, Wesm. (= *multicolor*, Grav.), *I. gradarius*, Wesm. (♂ = *refractorius*, Wesm.), and *præstigator*, Wesm. (= *Aoplus inermis*, Tischb.), noticed; Tischbein, S. E. Z. xliii. pp. 478 & 479. *I. insidiosus*, Wesm.: sexes described; Kriechbaumer, Ent. Nachr. viii. pp. 122–129. *I. rufiventris* parasitic on *Pyrameis cardui*; Heustis, Rep. E. Soc. Ont. 1881, p. 29.

Amblyteles palliatorius, Grav. Varieties tabulated, and *ater*, Grav., redescribed; Tischbein, S. E. Z. xliii. pp. 480–484.

Hepiopelmus leucostigmus. Parasitic on *Simyra albo-venosa*, De Geer, noticed; Holmgren, Ent. Tidskr. iii. pp. 87–89.

Pyramidophorus, g. n., Tischbein, S. E. Z. xliii. p. 484. Allied to *Trogus* and *Hepiopelmus*; type, *P. flavo-guttatus*, sp. n., *l. c.*, Thuringia.

New species:—

Ichneumon immundus, Eutin, p. 475, *maculiferus*, *subobsoletus*, Birkenfeld, p. 476, *obscuripes*, Dresden, p. 477, *pyrenæus*, Pyrenees, p. 478, and *leucomelanus*, Lombardy, p. 480, Tischbein, S. E. Z. xliii.; *I. repetitor*

and *imitator*, Kriechbaumer, Ent. Nachr. viii. pp. 237 & 239, both from S. France and Spain; *I. ustus*, *nigripes*, p. 324, and *paradoxus*, p. 325, Provancher, Nat. Canad. xiii., Canada.

Trogus excellens, Tischbein, *l. c.* p. 485, Eutin.

Psilomastax lapidator, Grav., and *pyramidalis*, Tisch., discussed; Kriechbaumer, Ent. Nachr. viii. pp. 173–177.

Amblyteles bicolor, id. *l. c.* p. 240, Montpellier; *A. marginatus* and *borealis*, Provancher, *l. c.* p. 328, Canada.

Platylabus rubricapensis, id. *l. c.* p. 329, Canada.

Anisobas buccatus, S. Spain, and *cephalotes*, Hungary, Kriechbaumer, *l. c.* pp. 241 & 242.

Phæogenes aterrimus, *nigricornis*, p. 330, *gaspesianus*, *tuberculifer*, *falardeaui*, p. 331, and *orbus*, p. 332, Provancher, *l. c.*, Canada.

Cryptides.

Pezomachus. Captures of various species in Devonshire; Bignell, Ent. xv. pp. 45 & 46.

New species:—

Stilpnus lævis, Provancher, Nat. Canad. xiii. p. 332, Canada.

Phygadeuon lavoiei, p. 353, *orbitalis*, *cephalicus*, p. 354, *parallelus*, 3-*annulatus*, *mignaulti*, p. 355, *aciculatus*, *lechevallieri*, *cornutus*, p. 356, *autumnalis*, *subspinosus*, *constrictus*, *terminatus*, p. 357, *rubricus*, *alternans*, *acaudus*, p. 358, and *attenuatus*, p. 359, *id.* l. c.; *P. maturus*, p. 68, *mucronatus*, p. 73, *pallicosus*, *robustus*, p. 75, *rufulus*, p. 75, *id. op. cit.* xi., Canada. [Omitted from Zool. Rec. xvi.; cf. *Ins.* p. 114 of that vol.]

Cryptus humeralis, Perleberg, p. 279, *longiseta*, Thuringia, p. 280, *pectinitarsis*, *erythrosoma*, p. 281, *bicolor*, Perleberg, *elongatus*, Eberswalde, p. 282, *campactus* [sic], Zerbst, *robustus*, Thuringia, p. 283, *senilis*, Perleberg, *melanosoma*, Eberswalde, p. 284, *annulitarsis*, *napiformis*, p. 285, *histrionicus*, *gallarum*, Perleberg, p. 286, *picticornis*, Eberswalde, *erythronotus*, p. 287, *leucozonius*, *illustris*, p. 288, and *dineuræ*, Perleberg, p. 289, Rudow, Ent. Nachr. viii.; *C. soriculatus* and *elongatus*, Provancher, *l. c.* xiii. p. 362, Canada.

Mesostenus ruficollis, Thuringia, and *argiolus*, Perleberg, Rudow, *l. c.* p. 33; *M. flavipes* and *nobilis*, Provancher, *l. c.* p. 363, Canada.

Hemiteles persector and *litoreus*, Parfitt, Ent. M. M. xviii. pp. 184 & 272, Devonshire; *H. nigricans*, *pallipennis*, p. 360, *crassus* and *longicornis*, p. 361, Provancher, *l. c.*, Canada.

Thaumatotypus billupsi, Bridgman, Tr. E. Soc. 1882, p. 145, Burford Bridge.

Aptesis fœrsteri, id. *l. c.* p. 146, Norfolk.

Pimplides.

Fitch, E. A. External Parasites of Spiders. Ent. xv. pp. 169–175, woodcuts. (*Cf.* also Fitch, P. E. Soc. 1882, p. xii., and Cambridge, Ent. xv. p. 216.)

Relates to the habits of different species of *Polysphincta* and *Acrodac-*

tyla. *P. tuberosa*, Grav., is figured in various stages, as also the cocoon of *P. pallipes*, Holmgr. (?).

Rhyssa atrata and *lemator* popularly described; Harrington, Canad. Ent. xiv. pp. 81–84. They probably do not deposit their eggs in larvæ; Clarkson, *tom. cit.* pp. 223 & 224.

Lissonota fletcheri, sp. n., Bridgman, Tr. E. Soc. 1882, p. 163, England.

Bassides.

Bassus holmgreni, sp. n., *id. l. c.* p. 161, England.

Tryphonides.

Colpotrochia amœna, sp. n., Rudow, Ent. Nachr. viii. p. 33, Perleberg.

Ctenopelma spectabilis[*-ie*], sp. n., *id. l. c.* p. 34, Saxony.

Mesolius pini, Bridgman, Tr. E. Soc. 1882, p. 156, Scotland; *M. elegans*, Parfitt, Ent. M. M. xviii. p. 273, England; *M. hirtus*, Rudow, *l. c.* p. 34, Perleberg: spp. nn.

Monoblastus caproni, sp. n., Bridgman, *l. c.* p. 159, Shere, Surrey.

Polyblastus bridgmani, sp. n., Parfitt, *l. c.* p. 251, Exeter.

Ophionides.

Ophion (?). Fossil species noticed and figured; Sordelli, Rend. Ist. Lomb. (2) xv. pp. 134 & 135, fig. 1, and Bull. Ent. Ital. xiv. pp. 228 & 229. *O. macrurum* noticed and figured; W. Saunders, Canad. Ent. xiv. p. 43, fig. 7.

Paniscus testaceus, Grav. Habits of larva; Adamson, Ent. xv. pp. 163 & 164.

Limneria kriechbaumeri, Bridgm. Jumping habits of the pupa; Bridgman, Ent. xv. pp. 215 & 216.

Anomalon pictum, sp. n., Rudow, Ent. Nachr. viii. p. 35, S. Europe.

Campoplex semirufus, sp. n., Provancher, Nat. Canad. xiii. p. 364, Canada.

Limneria kriechbaumeri, rufa, brischkii, Bridgman, Tr. E. Soc. 1882, pp. 151–153, England; *L. affinis*, Parfitt, Ent. M. M. xviii. p. 252, Exeter; *L. nigricoxa* and *distincta*, Provancher, Nat. Canad. xiii. pp. 364 & 365, Canada, spp. nn.

Pyracmon rufum, id. *l. c.* p. 365, Canada.

Cremastus royi and *longicaudus*, id. *l. c.* pp. 366 & 367, Canada.

Atractodes autumnalis, p. 367, *nigricoxus* and *nitens*, p. 368, *id. l. c.*, Canada: spp. nn.

Mesochorus formosus, Bridgman, *l. c.* p. 154, England.

Thersilochus pallipes, Provancher, *l. c.* p. 367, Canada.

Braconidæ.

Brischke, C. G. A. Die Ichneumoniden der Provinzen West- und Ostpreussen. Schluss. *Braconidæ*. Schr. Ges. Danz. (2) v. 3, pp. 121–183.

Lists of species and "hosts"; no new species described.

Riley, C. V. Notes on North American Microgasters, with descriptions of new species. Tr. Ac. St. Louis, iv. pp. 296–315, woodcuts.

This paper commences with general remarks, and a full account of the habits, &c., of *Apanteles aletiæ*, Riley; and concludes with a list of known North American species.

Westwood, J. O. Descriptions of new or imperfectly known species of Ichneumones Adsciti. Tijdschr. Ent. xxv. pp. 17–48, pls. iv.–viii. 32 species noticed.

Spinaria armator, Fabr., *sulcator*, Smith, *spinator*, Guér., and *fuscipennis*, Brullé. Descriptions reprinted; *id. l. c.* pp. 26–29.

Cenocalius, Hal., recharacterized, and the following known species redescribed:—*C. cephalotes*, Smith, fig. 5, *insidiator*, Smith, *bifasciatus*, Brullé, figs. 7–10, and *nigriventris*, Cress., *id. l. c.* pp. 33–36 & 41, pl. vii.

Stenophasmus ruficeps, Smith, genus and species redescribed and figured; *id. l. c.* pp. 41–43, pl. viii. figs. 1–5.

Streblocera fulviceps, Westwood, genus and species redescribed; *id. l. c.* pp. 44 & 45, pl. viii. figs. 6–8.

Microgaster carinatus, Pack., = *gelechiæ*, Ril[illegible], = *glomeratus*, Pack. (*nec* Bouché), = *utilis*, French, = *Apanteles congregatus*, Say, var., and renamed var. *pieridivora*; *M. atalantæ*, Pack., is another var. of *M. congregatus*; *M. carduicola*, Pack., is closely allied to, but distinct from, *Apanteles theclæ*, Riley; *Microgaster lunatus*, Pack., is an *Apanteles*. Riley, Am. Nat. xvi. pp. 680 & 681.

Apanteles congregatus, Say. Riley discusses this species and its varieties, to some of which he gives the names of *hemileucæ*, *rufo-coxalis*, and *scitulus*. *A. congregatus*, Prov., = *gelechiæ*, Riley; Tr. Ac. St. Louis, iv. pp. 309–311.

Pachyloma cremieri, Breb., redescribed; Arnold, Hor. Ent. Ross. xvi. pp. 146–149.

New genera and species:—

Snellenius, Westwood, Tijdschr. Ent. xxv. p. 19. Neuration of *Microgaster*, antennæ rather longer than the wings, 17-jointed, scape rather thick, the remaining joints subquadrate, broad, flattened, and distinctly tapering from the middle to the tip. Type, *S. vollenhovii*, sp. n., *l. c.* pl. iv. figs. 1–4, New Guinea.

Agathophiona, id. *l. c.* Allied to *Microdus*; type, *A. fulvicornis*, sp. n., *l. c.* p. 20, pl. iv. figs. 5–13, Mexico.

Agathirsia, id. *l. c.* p. 20. Allied to last; to include *Microdus thoracicus*, Cress.; and *A. rufula*, figs. 1–4, *rufiventris*, figs. 5–8, p. 21, *proxima*, and *fulvo-castanea*, figs. 9 & 10, p. 22, pl. v., Mexico: spp. nn.

Agathona, id. *l. c.* p. 22. Allied to last; type, *A. sericans*, sp. n., *l. c.* p. 23, pl. v. figs. 11–15, Mexico.

Agathilla, id. *l. c.* p. 23. Allied to last; type, *A. fulvo-picta*, sp. n., *l. c.* p. 24, pl. vi. figs. 1–7, Mexico.

Euscelinus, id. *l. c.* p. 25. Allied to *Perilitus*, but with the hind femora thickened and dentated; type, *E. sarawacus*, sp. n., *l. c.* pl. vi. fig. 9, Saráwak.

Myosoma pennipes, id. *l. c.* p. 25, pl. vi. fig. 8, Santarem.

Spinaria attenuata, fig. 1, Saráwak, p. 30, *leucomelæna*, fig. 2, Cambodia, Siam, *dimidiata*, figs. 3 & 4, Ceram, p. 31, and *suliana*, Sula, p. 32, *id. l. c.* pl. vii.

Cenocælius amazonicus, Amazons, p. 36, *gerasinorum*, Minas Geraes, p. 37, *columbianus*, Colombia, *nigritus*, p. 38, and *sexnotatus*, pl. vii. fig. 6, Amazons, p. 39, *id. l. c.*

Stenophasmus apicalis, Borneo, and *femoralis*, Mysol, *id. l. c.* p. 43.

Streblocera longiscapha, id. *l. c.* p. 45, pl. viii. fig. 9, England.

Bracon sculptilis, id. Tr. E. Soc. 1882, p. 327, pl. xiv. fig. 27, Ceylon.

Microplitis ceratomiæ (fig. 8, cocoons), Missouri, and *gortynæ*, Iowa, Riley, Tr. Ac. St. Louis, iv. pp. 303 & 304.

Apanteles megathymi, South Carolina, p. 304, *cacœcia*, p. 305, Missouri, *aletiæ*, fig. 1, Florida, Alabama, p. 306, *politus*, Missouri, *cassianus*, Illinois, p. 307, *theclæ*, Georgia, *limenitidis* and form *flaviconchæ*, Connecticut, Missouri, p. 308, *semerinthi*, St. Louis, p. 311, *acronyctæ*, Illinois, p. 312, and *palæacritæ*, Illinois, Canada West, p. 313, *id. l. c.*

Evaniidæ.

Paramegischia, g. n., Provancher, Nat. Canad. xiii. p. 302. Allied to *Aulacus*; type, *P. burquii*, sp. n., *l. c.* p. 303, Canada.

Chalcididæ.

Ashmead, W. H. Studies on the North American *Chalcididæ*, with descriptions of new species from Florida. Tr. Am. Ent. Soc. ix. pp. xxix.–xxxv.

Relates to *Smicra*, *Eurytoma*, *Decatoma*, *Isosoma*, *Callimome*, and *Chirocerus*.

Mayer, P. Zur Naturgeschichte der Feigeninsecten. MT. Zool. stat. Neap. iii pp. 551–590, pls. xiv. & xv. and 2 woodcuts. (*Cf.* H. Müller, Biol. Centralbl. ii. pp. 545–550; also Bull. Ent. Ital. xiv. p. 242.)

Relates to caprification, and contains a detailed account of the habits, anatomy, and transformations of *Blastophaga grossorum*, Grav., "*Ichneumon*" *ficarius*, Cav., and *Sycophaga sycomori*, Linn. The other known species of fig-insects, are more briefly noticed, and a large number of undetermined species from various parts of the world are mentioned, and details figured.

Saunders, [Sir] S. S. Notes on the *Euchalcis vetusta*, Duf. (fam. *Chalcididæ*), and on the terminal segments of the females in *Halticella* and its allies. Tr. E. Soc. 1882, pp. 291–305, pl. xii.

Chalcis vetusta, André, is quite distinct from Dufour's insect, but perhaps = *Halticella osmiicida*, Saund., of which an amended description is given. The terminal segments of *H. osmiicida* are then elaborately described, with special reference to the opinions expressed by André and Walker, and most of the important structural details of the insect are figured. (See also a correspondence between Saunders and André, P. E. Soc. 1882, pp. xxiii.–xxviii., figs.

Solms-Laubach, H. [Graf zu]. Die Herkunft, Domestication und Verbreitung des gewöhnlichen Feigenbaums (*Ficus carica*, L.). Abh. Ges. Götting. xxviii. 2, pp. 106. [*Cf.* F. & H. Müller, Kosmos, xi. pp. 306–315, 342–348, and Biol. Centralbl. ii. pp. 193–197.

Includes a full account of caprification as practised in various countries, and remarks on the habits of *Cynips psenes*, L. (= *Blastophaga grossorum*, Grav.), and *Cynips sycomori*, Hasselq. (= *Sycophaga crassipes*, Westw.).

Westwood, J. O. Descriptions of the Insects infesting the seeds of *Ficus sycomorus* and *caricæ*. Tr. E. Soc. 1882, pp. 47–60, pls. ii.–v.

Relates almost entirely to the structure and transformations of *Sycophaga crassipes*, Westw. (pp. 51–55, pls. ii. & iii.), and *Blastophaga psenes*, Linn. (= *sycomori*, Linn. Mus., pt.; Westw., and *grossorum*, Grav.), pp. 55–58, pls. iv. & v. The writer regards them as true *Chalcididæ*, having some affinity to *Callimome*.

——. On the supposed abnormal habits of certain species of *Eurytomides*, a group of the Hymenopterous family *Chalcididæ*. Tr. E. Soc. 1882, pp. 307–328, pls. xiii. & xiv. Supplementary note. P. E. Soc. 1882, pp. xxviii. & xxix.

Includes an abstract of the observations of various authors from Walker and Nees von Esenbeck to the present time, on the habits of the *Eurytomides*, with special reference to *Isosoma hordei*, Harr., and other species reputed to attack corn. The paper also contains an account of one or two undetermined species of *Isosoma* observed by T. Whitmarsh, and details of *Isosoma* sp., and *I. hordei*, Harr., and descriptions and figures of 2 new species of *Eurytomides*, and a new *Bracon*. [*Cf.* also P. E. Soc. 1882, p. ix., where Fitch disputes the alleged phytophagous habits of *Eurytoma hordei*, &c.]

Notes on economy of *Chalcididæ*; Fitch, Ent. xv. pp. 93 & 94.

On the pupation of various *Chalcididæ*; Howard, Am. Nat. xvi. pp. 60–62 & 149–151.

Large numbers of a small Chalcid bred from a larva of an *Acidalia*; Millière, Rev. d'Ent. i. p. 165.

Smicra, Spin. Synopsis and synonymy of European species; W. F. Kirby, Ent. xv. pp. 241–244, woodcut.

Chalcis (*sispes*) *biguttata*, Spin., noticed; Costa, Atti Acc. Nap. ix. (6) p. 44.

Eupristina masoni and *Plistodontes imperialis*, Saund., noticed; Saunders, Ent. M. M. xix. pp. 163 & 164.

Eurytoma, sp. noticed; Gard. Chron. (2) xvi. [1881] p. 576.

Copidosoma terebrator, Mayr, and *flagellare*, Dalm. Males described; Wachtl, Wien. ent. Z. i. pp. 296–298.

Eupelmus bifasciatus, Först., ♂ described; *id. l. c.* p. 296.

Antigaster mirabilis, Walsh. The ovipositor is not exserted; French, Canad. Ent. xiv. p. 35.

New species:—

Leucaspis torquata, Costa, Atti Acc. Nap. ix. (11) p. 37, Sardinia.

Smicra decem-punctata, Ashmead, Tr. Am. Ent. Soc. ix. p. xxix., Florida.

Chalcis discrepans and *strigulosa*, Costa, Atti Acc. Nap. ix. 6, pp. 40 & 41, Calabria.

Torymus glechomæ, Möller, Ent. Tidskr. iii. p. 179, Sweden.

Callimome cærulea, *recemareæ*, *ænea*, *brevissimicauda*, p. xxxiii., *elegantissima*, *virentis*, p. xxxiv., Ashmead, *l. c.*, Florida.

Decatoma bicolor and *catesbii*, id. *l. c.* p. xxxii., Florida.

Eurytoma taprobanica, Westwood, Tr. E. Soc. 1882, p. 327, pl. xiv. figs. 23 & 25, Ceylon; *E. phylloxeræ*, p. xxx., *succinipedis* and *albipes*, p. xxxi., Ashmead, *l. c.*, Florida.

Isosoma orchidearum, Westwood, *l. c.* p. 323, pl. xiii., Brazil: *I. tritici*, Riley, Am. Nat. xvi. p. 247, fig. 1 (larva), pp. 1017 & 1018, and Rep. Ins. 1882, pp. 183–187, pl. xii. fig. 3, United States; *I. allynii* and *elymi*, French, Canad. Ent. xiv. pp. 9 & 10, Illinois. [*Cf.* also pp. 48 & 49, where *I. allynii* is referred by Riley and French to *Eupelmus*; and pp. 97 & 98, where *I. elymi* is stated to be distinct from *I. tritici*, Riley.]

Discondylus dromedarius, Costa, *l. c.* ix. (11) p. 38, Sardinia.

Cerapterocerus læte-vittatus, id. *ibid.*, Sardinia.

Plaigmesopus apicalis, Westwood, *l. c.* p. 326, note, pl. xiv. figs. 21 & 22 (details), England.

Eupelmus rosæ and *cynipidis*, Ashmead, Canad. Ent. xiv. p. 36, Florida.

Coccophagus annulipes, id. *l. c.* p. 37, Florida.

Arthrolytus puncticollis, Möller, *l. c.* p. 180, Sweden.

Chirocerus floridanus, Ashmead, Tr. Am. Ent. Soc. ix. p. xxxiv., Florida.

Stictonotus isosomatis, Riley, Rep. Ins. 1882, p. 186, Tennessee.

Proctotrypidæ.

Notes on a supposed new species; Wilson, Tr. R. Soc. S. Austr. v. p. 106.

Gonatopus pilosus, Thoms., and *pedestris*, Dalm., parasitic on various *Homoptera*; Douglas, Ent. M. M. xix. pp. 116 & 142; Mik, Wien. ent. Z. i. pp. 215–221, pl. iii.

Proctotrypes bistriatus and *fovcolatus*, spp. nn., Möller, Ent. Tidskr. iii. pp. 180 & 181, Sweden.

Cynipidæ.

Ashmead, W. H. On the Cynipideous Galls of Florida. Tr. Am. Ent. Soc. ix. pp. ix.–xx. & xxiv.–xxviii.

Includes descriptions of several new species.

Lichtenstein, J. Alternation of Generations in the *Cynipidæ*. Ent. M. M. xviii. pp. 224–227.

Mayr, G. Die europäischen Arten der gallenbewohnenden Cynipiden. (Separatabdruck aus dem einundzwanzigsten Jahresberichte der Communal-Oberrealschule im I. Bezirke.) Wien: 1882, 8vo, pp. 44.

The descriptions are arranged in the usual dichotomous form, separate tables being given for the males and females. A few new species are described.

Paszlavsky, J. Ueber die Bildung des Bedeguars. Term. füzetek, v. pp. 198–216 & 277–296, pl. i. [*Cf.* Karsch, Biol. Centralbl. ii. pp. 617–620.]

After an analysis of the opinions of previous authors on this subject, the writer details his own observations on *Rhodites rosæ*. The eggs are laid on the young leaves both above and below, and as near the mid-rib as possible, and on the stalk; and the bedeguar is formed of the three leaflets that would otherwise be developed on the stalk. The bedeguars formed at the end of a twig are, however, composed of one leaf only.

Abstract of Adler's paper on *Cynipidæ* in Z. wiss. Zool.; Arch. Z. expér. ix. pp. xvii.–xxii.

Analysis of Lichtenstein's work on *Cynipidæ*; Van Segvelt, CR. Ent. Belg. xxvi. pp. xi.–xviii.; Howard, Psyche, iii. p. 329.

Preliminary notice of a work by Beyerinck on the early phases of development of galls of *Cynipidæ*; Ramvenhoff & De Vries, Versl. Ak. Amst. (2) viii. pp. 260–265.

List of North American *Cynipidæ*; Bassett & Riley, Am. Nat. xvi. p. 246 [*cf.* also pp. 329 & 330].

On the identification of *Diplolepis gallæ-umbraculatæ*, Anthoine, *Synergus calicis* and *Cynips glutinosæ*, Gir.; Lichtenstein & Fairmaire, Bull. Soc. Ent. Fr. (6) ii. p. xvii. One of the forms discussed is subsequently indicated by Fairmaire as new, under the name of *Cynips gallæ-viscosæ*; *l. c.* pp. xxxiv. & xxxv.

Notes on galls: *Rhodophilus lœwii*, Mayr, and *Pediaspis sorbi-aceris* are dimorphous forms of the same species; Schlechtendahl, Z. ges. Naturw. lv. pp. 118 & 119.

Andricus (*Aphilothrix*) *callidoma*, Adler, renamed *giraudi*, *Cynips cincta*, Hart., = *conglomerata*, Gir., *C. gallæ cristatæ*, Hensch., = *C. caput medusæ*, Hart.; Wachtl, Wien. ent. Z. i. p. 295.

Aphilothris radicis, Fabr. (= *Andricus trilineatus*, Hart.). Gall, insect, &c., described; Magretti, Boll. scient. iv. pp. 13–17.

Dryorhizoxenus, g. n., Ashmead, Tr. Am. Ent. Soc. ix. p. xxv. Allied to *Biorhiza*; type, *D. floridanus*, sp. n., *l. c.*, Florida.

New species:—

Cynips q.-virens, p. x., *q.-batatoides*, *q.-succinipes*, p. xi., *q.-foliata*, *q.-lanigera*, p. xiii., *q.-catesbii*, p. xv., *q.-turneri*, *q.-aquaticæ*, p. xvi., *q.-confusa*, *q.-rugosa*, p. xviii., *q.-cinerea*, p. xix., *q.-racemaria*, p. xxvi., *q.-clavigera*, *q.-conifera*, p. xxvii., *q.-citriformis*, p. xxviii., Ashmead, *l. c.*, Florida.

Spathogaster q.-laurifoliæ, id. *l. c.* p. xvii., Florida.

Timaspis phœnixopodos[*-nicopodus*], Mayr, Europ. Cynip. p. 5, Montpellier.

Aulax lichtensteini, S. France, and *serratulæ*, Luxemburg, *id. l. c.* pp. 7 & 9.

Andricus coriaceus, Montpellier, and *sufflata*, Vienna, *id. l. c.* pp. 20 & 22; *A.* (*Callirhytis*) *rufescens*, id. *l. c.* p. 13, Montpellier.

Plagiotrochus fusifex, S. France, and *emerii*, Italy, *id. l. c.* p. 33.

Dryocosmus australis, id. *l. c.* p. 34, S. France, Italy.

SIRICIDÆ.

KIRBY, W. F. [See *Tenthredinidæ*.]

Notes on 7 species of Canadian *Uroceridæ*; Harrington, Canad. Ent. xiv. pp. 224–228.

The following known species are redescribed and figured (Kirby, List Hym. i.):—*Oryssus maculipennis*, Smith, var., fig. 11, p. 366, *batesianus*, Westw., fig. 12, p. 367, *Derecyrta pictipennis*, Smith, *Brachyxiphus deceptus*, Smith (= *flavo-picta*, Smith), figs. 10 & 16, p. 369, and *Xiphydria walshi*, Westw., fig. 14, p. 371, pl. xiv., *Sirex cedrorum*, Smith, figs. 2 & 3, p. 375, *japonicus*, Smith, fig. 4, p. 376, *varipes*, Walk., fig. 9, pl. xv. p. 377, *flavicornis*, Fabr., pl. xii. fig. 18, p. 380, *bizonatus*, Steph., p. 381, *xanthus*, Cam., fig. 7, p. 383, and *Tremex smithi*, Cam., fig. 1, pl. xv. p. 385.

Sirex gigas noticed; Lucas, Bull. Soc. Ent. Fr. (6) ii. p. lxxxix. *S. nigricornis*, Acerbi (*nec* Fabr.), renamed *dubia*; Kirby, *l. c.* p. 375.

Teredon, Nort. (pre-occupied), renamed *Teredonia*; id. *l. c.* p. 386.

Derecyrta reedi, sp. n., Kirby, List Hym. i. p. 369, pl. xiv. fig. 15, Chili.

Brachyxiphus hyalinus, sp. n., *id. l. c.* pl. xiv. fig. 9, Chili.

Sirex stephensi (= *magus*, Steph., pt.), England (introduced), fig. 6, p. 375, *apicalis*, fig. 11, Vancouver's Island, p. 377, *abbotti*, fig. 8, Georgia, p. 378, *flavipennis*, fig. 10, Vancouver's Island, *hirsutus*, fig. 6, Georgia (?), p. 380, *imperialis*, fig. 5, India, and *australis*, fig. 12, Australia, p. 383, *id. l. c.* pl. xv., spp. nn.

TENTHREDINIDÆ.

CAMERON, P. A Monograph of the British Phytophagous *Hymenoptera* (*Tenthredo*, *Sirex*, and *Cynips*, Linné). (Ray Society.) Vol. i. London: 1882, 8vo, pp. viii. & 340, pls. xxi., plain and coloured. [*Cf.* Ann. N. H. (5) x. pp. 471–473.]

An exceedingly elaborate work, in which the structure, habits, transformations, food-plants, parasites, &c., are fully detailed. Seven plates represent larvæ, seven perfect insects, six various forms of the saws, on which the author lays great stress; and the last illustrates miscellaneous details. The contents of the plates are too extensive to be given here in full. Synopses of the species of each genus are given, as well as good indices and a bibliography. The three groups included in the present volume, according to the author's arrangement, are as follows:—TENTHREDINIDÆ: *Tenthredinides*, *Dolerides*, *Selandriides*.

——. On the use of coloration and markings of Caterpillars, and on the development of the insect. P. Glasg. Soc. iv. pp. 224–226, 256, & 257. Relates to *Tenthredinidæ*.

KIRBY, W. F. List of *Hymenoptera*, with descriptions and figures of the typical specimens in the British Museum. 1. *Tenthredinidæ* and *Siricidæ*. London: 1882, 8vo, pp. xxviii. & 450, and 16 col. plates.

The arrangement followed corresponds nearly with that adopted by Norton, and is as follows:—

TENTHREDINIDÆ: *Cimbicinæ, Hylotominæ, Loboceratinæ, Pterygophorinæ, Lophyridinæ, Nematinæ, Selandriinæ, Phyllotominæ, Emphytinæ, Dolerinæ, Athaliinæ, Tenthredininæ, Lydinæ, Xyelinæ, Cephinæ.*

SIRICIDÆ: *Oryssinæ, Xiphydriinæ, Siricinæ.*

The alterations in synonymy in this work are too extensive to be noticed, except in the case of renamed species.

MAGRETTI, P. Ricerche microscopiche sopra i liquidi di secrezione e di circolazione nelle larve d'alcuni Imenotteri tentredinidei. Boll. scient. iv. pp. 58 & 59.

Relates to the liquid discharged by the larvæ of *Cræsus septentrionalis*, *Hylotoma rosæ*, and *Nematus*.

On varieties and anomalies observed in various *Tenthredinidæ*; id. Bull. Ent. Ital. xiv. pp. 239–241.

Third list of *Tenthredinidæ* of Yorkshire; Bairstow, Roebuck, & Wilson, Tr. Yorksh. Union, iv. pp. 92–96.

List of *Tenthredinidæ* of the neighbourhood of Paris; De Gaulle, Feuill. Nat. ii. pp. 125–128, and Hamm[illegible]cki, *op. cit.* iii. pp. 22 & 24.

Tenthredo coxalis, Smith, is a *Strongylogaster*; *Ancyloneura*, Cam., = *Cladomacra*, Smith, ♀; *Decameria*, Lep., and *Perreyia*, Brullé, characterized; *Camptoprium*, Spin., = *Decameria*; *Cephalocera* (?) *calcar*, Nort., is a *Loboceras*; *Nematus betularius*, Hart., = *erythrogaster*, Thoms. (*nec* Nort.); *N. conjugatus*, Dahlb., and *N. monticola*, Thoms., noticed as new to Britain; *N. consobrinus*, Voll., = *umbrinus*, Brischke & Zaddach; *N. varius*, André, = *pallescens*, Hart.; *N. marshalli*, Cam., noticed; *N. bellus*, B. & Z., = *baccarum*, Cam., which, besides *viminalis*, Linn. (*nec* Voll.), and *herbaceæ*, Cam., seems to be the only species forming round galls on willows; *Dolerus chappelli*, Cam., is probably distinct from *geniculatus*, Lep.; *Tenthredo chloros*, Rud., = *viridis*, Linn. (*scalaris*, Klug). Cameron, Ent. M. M. xix. pp. 132–135.

Cimbicinæ.

The following known species are redescribed and figured by Kirby (List Hym. i.):—*Cimbex americana*, Leach, pls. i. fig. 2, xvi. fig. 2, p. 5, *violacea*, St. Farg. p. 6, *Trichiosoma scalesi*, Leach, pl. i. fig. 8, p. 9, *Praia taczanowskii*, Wank., p. 12, note, *Abia brevicornis*, Leach, pl. xvi. fig. 4, p. 14, *Perya dorsalis*, Leach, pl. i. figs. 11, 12, & 12 *a*,*b*, p. 18, *kirbii*, Leach, ♀, fig. 2, *polita*, Leach, fig. 1, p. 21, *ferruginea*, Leach, fig. 6, p. 24, *latreillii*, Leach, fig. 8, p. 25, *leachi*, Westw., fig. 11, p. 30, and *Incalia hirticornis*, Cam., fig. 16, p. 32, pl. ii.

Trichiosoma lucorum noticed; Sci. Goss. xviii. pp. 236 & 237.

Zaræa fasciata. Remarks on parthenogenesis, growth of egg, mode of oviposition, &c.; Osborne, Ent. M. M. xix. pp. 97–100.

Cephalocera, Klug (*nec* Latr.) renamed *Corynophilus*; Kirby, List Hym. i. p. 32.

New genera and species:—

Cerealces, id. *l. c.* p. 31. Neuration of *Perga*; antennæ ten-jointed, and

thickest in the middle. Type, *C. scutellata*, sp. n., *l. c.* p. 31, pl. ii. fig. 15, S. Australia.

Paralyppia, *id. l. c.* p. 33. Affinities doubtful, perhaps allied to *Cephalocera*, but with some resemblance to *Perreyia*; antennæ eight-jointed. Type, *P. picipes*, sp. n., *l. c.* pl. ii. fig. 17, Santarem.

Cimbex ariana, pl. i. fig. 3, North India, p. 4, *sibirica*, pls. i. fig. 1, & xvi. fig. 3, Siberia, pp. 4 & 387, *japonica*, pl. xvi. fig. 1, Japan, p. 4, *hudsonica*, pl. i. fig. 4, Hudson's Bay, p. 8, *id. l. c.*

Trichiosoma arcticum (? = *lucorum*, W. Kirby), Arctic America, and *crassum*, Newfoundland, *id. l. c.* pp. 10 & 11, pl. i. figs. 7 & 5.

Abia imperialis, id. *l. c.* p. 15, pl. i. fig. 10, North China.

Amasis subflavata, id. *l. c.* p. 17, pl. i. fig. 9, Cordova, Argentine Republic.

Perga affinis, figs. 13 & 14, Victoria, Tasmania, *castanea*, p. 19, fig. 6, pl. i. p. 20, *glabra*, fig. 5, Sydney, *bisecta*, fig. 4, N.W. Australia, p. 23, *unicittata*, fig. 7, Australia, p. 25, *belinda*, fig. 3, Australia, *dubia*, fig. 9, Swan River, p. 27, *amœnaida*, fig. 10, p. 28, *dentata*, fig. 13, *rufo-maculata*, fig. 12, Adelaide, p. 29, and *jucunda*, fig. 14, pl. ii. W. Australia, p. 30, *id. l. c.*

Scolecordylocera saginata, Provancher, Nat. Canad. xiii. p. 290, Canada.

Hylotominæ.

The following known species are redescribed and figured by W. F. Kirby (List Hym. i.):—*Schizocerus plumiger*, Klug, pl. iii. figs. 7 & 8, p. 37, *Dielocerus ellisi*, Curt., fig. 1, p. 50, *Hylotoma sanguinicollis*, André, p. 51, note, *similis*, Voll., fig. 13, p. 51, *simillima*, Smith, fig. 18, *captiva*, Smith, fig. 14, p. 62, *flavicollis*, Cam., fig. 17, p. 63, *nigrinodosa*, Motsch., fig. 15, p. 64, *analis*, Leach, fig. 13, *clavicornis*, Fabr., fig. 14, p. 65, *abdominalis*, Leach, fig. 17, p. 67, *coccinea*, Fabr., fig. 19, pl. v. p. 68, *xanthothorax*, Leach, pl. vi. fig. 1, *albo-cincta*, Cam., pl. iv. fig. 12, p. 71, *xanthogaster*, Cam., fig. 1, p. 72, *lutea*, Cam., figs. 4 & 6, *bipunctata*, Cam., fig. 3, pl. v. p. 73.

New genera and species:—

Trichorachus, Kirby, List Hym. i. p. 39. Intermediate between *Schizocerus* and *Hylotoma*; antennæ bifurcated in ♂, very short in ♀; fore wings with one marginal appendiculate, and three submarginal cells; four hind tibiæ with middle spurs. To include *Hylotoma* (*Schizocera*) *australis*, Westw., and the following new species:—*T. sobrinus*, fig. 3, Australia (?), *hyalinus*, fig. 4, *nitidus*, figs. 1 & 2, p. 39, and *abdominalis*, fig. 5, Swan River, p. 40, pl. iii.

Topotrita, id. *l. c.* p. 48 (= *Hylotoma*, sect. 4, Klug); type, *H. leucocephala*, Klug.

Hemidianeura, id. *l. c.* (= *Ptilia*, Nort., *nec* St. Farg., = *Hylotoma*, sect. 2, Klug). To include *P. filiformis*, Nort., *P. mexicana*, Cress., *H. plumicornis*, *gonagra*, *ovalis*, and *ephippiata*, Klug, *Dielocera* (?) *crassicornis*, Cam., and *H. scapularis*, Mexico, and *nigricornis*, Santarem, p. 49, pl. iii. figs. 15 & 16: spp. nn.

Athermantus, id. *l. c.* p. 54. Allied to *Hylotoma*; tibiæ rather flattened and clothed with short bristles; no middle spurs; third joint of antennæ

rather short, thick, and flattened towards the extremity. Type, *H. imperialis*, Smith, redescribed and figured, *l. c.* pl. iii. fig. 18.

Scobina bicolor, W. F. Kirby, *l. c.* p. 41, pl. iii. fig. 6, Villa Nova, Amazons.

Gymnia inconspicua, figs. 9 & 10, Santarem, and *mexicana*, fig. 17, Mexico, *id. l. c.* pp. 42 & 43, pl. iii.

Ptilia basipunctata, fig. 11, Mexico, Honduras, *bicolor*, fig. 12, Brazil, p. 46, *pumilio*, fig. 13, p. 47, and *soror*, fig. 14, Amazons, p. 48, *id. l. c.* pl. iii.

Ptenus serratus, figs. 2 & 3, Cantagallo, p. 51, *violaceus*, fig. 5, Rio Janeiro, *diversipes*, fig. 4, Amazons, *consors*, fig. 6, East Brazil, p. 52, *atriceps*, fig. 8, Brazil (?), p. 53, *id. l. c.* pl. iv.

Hylotoma jonasi (= *nigritarsis*, Smith, *nec* Klug), fig. 11, p. 61, *rejecta* (= *ephippiata*, Smith, *nec* Klug, = *humeralis*, Voll., *nec* Beauv.), fig. 16, pl. iv. p. 62, *disparilis* (= *humeralis*, Smith, pt., *nec* Beauv.), figs. 7 & 9, *quadripunctata* (= *humeralis*, Smith, var. ♀), fig. 22, p. 63, *dubia* (= *similis*, Smith, *nec* Voll.), fig. 10, Japan, *eximia*, fig. 11, Mexico, p. 65, *borealis*, fig. 16, Hudson's Bay, *cyra*, fig. 18, Georgia (?), p. 66, *sphinx*, fig. 20, pl. v., North America (?), p. 68, *vittata*, pl. vi. fig. 2, Mexico, p. 70, *sinensis* (= *microcephala*, Cam., *nec* Voll.), fig. 2, p. 72, *victorina*, figs. 5 & 8, pl. v., China, p. 73, *andromeda*, fig. 7, Natal, *dirce*, fig. 15, Lake N'gami, p. 74, *urania*, fig. 10, Natal, *gambiæ*, fig. 9, pl. iv., Gambia, p. 75, and *dryope*, pl. vi. fig. 3, Amazons, p. 78, *id. l. c.*

Loboceratinæ.

Loboceratinæ, subfam. n., Kirby, List Hym. i. p. 79. Intermediate between *Cimbicinæ*, *Hylotominæ*, and *Tenthredinidæ*; general appearance of the last; discoidal cell absent; antennæ densely pubescent, intermediate tibiæ with middle spurs. To include *Perantherix*, Westw., *Loboceras*, g. n., and *Aulacomerus*, Spin.

Loboceras, g. n., *id. ibid.* Antennæ seven-jointed, last joint cup-shaped; hind coxæ long and large. Types, *L. mexicanum*, Orizaba, *lucidum* and *hippolyte*, Amazons, spp. nn., *l. c.* p. 80, pl. vi. figs. 4–6.

Perantherix fatima, sp. n., *id. l. c.* p. 79, pl. vi. fig. 7, Amazons.

Pterygophorinæ.

Pterygophorus cygnus, West Australia, and *leachi*, Queensland, *id. l. c.* pp. 81 & 82, pl. vi. figs. 10 & 9: spp. nn.

Lophyrinæ.

Gibard, M. Les Tenthrèdes des pins. J. Soc. Nat. d'Hortic. (3) iii. pp. 702–707.

Kirby (List Hym. i.) figures and redescribes the following known species:—*Lophyrus fortunii*, Leach, fig. 11, p. 86, *abbotti*, Leach, fig. 12, p. 87, *americanus*, Leach, fig. 8, p. 88, *Perreyia compta*, Nort., figs. 13 & 15, pl. vi. p. 90, *Ancyloneura nigripes*, Smith, fig. 7, p. 95, *varipes*, Cam., fig. 6, and *Cladomacra macropus*, Smith, fig. 8, pl. vii. p. 96.

Lophyrus. Several species attacked by *Chrysis cyanopyga*, Dahlb.;

Lamprecht, Ent. Nachr. viii. p. 253. *L. pini*, Latr.: ravages noticed; Caron, Bull. Soc. L. Nord Fr. v. pp. 178 & 179. *L. pini* and *rufus* noticed: Holmgren & Forssell, Ent. Tidskr. iii. pp. 4, 5, 97 & 98.

New genera and species:—

Lophyroides, Cameron, Ent. M. M. xix. p. 133. Allied to *Perreyia*; antennæ with more than thirteen joints, flabellate in ♂; maxillary palpi four- and labial three-jointed; second cubital cell usually receiving both recurrent nervures; appendicular cellule in hind wings very small. Type, *Lophyrus tropicus*, Nort.; add *cordoviensis*, Nort., and *ruficollis*, Cam. (sp. n., *l. c.* p. 133). Central America (probably = *Perreyia compta*, ♂, Kirby, *nec* Nort.).

Acherdocerus, Kirby, List Hym. i. p. 92. Allied to *Decameria* and *Perreyia*; shape of *Selandria*. Type, *A. fumipennis*, sp. n., *l. c.* p. 93, pl. vii. fig. 1, Mexico.

Euryopsis, id. *l. c.* p. 95. Allied to *Eurys*; antennæ eleven-jointed. Type, *E. nitens*, sp. n., *l. c.* p. 95, pl. vii. fig. 5, Adelaide.

Polyclonus, id. *l. c.* p. 97. Placed after *Cladomacra*; antennæ in ♂ thirteen-jointed, each joint throwing off a long pilose ramus from the extremity. Type, *P. atratus*, sp. n., *l. c.* pl. vii. fig. 3, Australia.

Perreyia (?) *anomala*, Mexico, and *P. amazonica*, Amazons, *id. l. c.* pp. 90 & 91, pl. vi. figs. 14 & 17.

Camptoprium humerale, Santarem, and *C.* (?) *nigriceps*, Mexico, *id. l. c.* p. 92, pl. vi. figs. 16 & 18.

Decameria [St. Farg., recharacterized, l. c.] *testacea*, id. *l. c.* p. 93, pl. vii. fig. 2, Amazons.

Eurys nitidus, id. *l. c.* p. 94, pl. vii. fig. 4, Australia.

Nematinæ.

Raymond, G. Observations sur l'organisation et les mœurs du *Nematus ribesii*, Scop. Ann. Soc. Ent. Fr. (6) ii. pp. 286–312.

Includes a very full account of the anatomy and habits of the insect in all its stages.

Cladius isomerus, Nort. Larva noticed, from Barnston's MSS.; Kirby, List Hym. i. p. 98, note.

List of British green species of *Nematus*. *N. bergmanni*, Dahlb. (*nec* Thoms.) = *prasinus*, Hart., and *miliaris*, Panz., = *viridis*, Hart.,; Cameron, Ent. M. M. xviii. pp. 193–195. *N. ambiguus*, Först. (*nec* Fall.), renamed *decipiens*, *N. hæmorrhoidalis*, Hart. (*nec* Spin.), renamed *incertus*, p. 107, *insignis*, Thoms. (*nec* Hart.), renamed *nobilis*, p. 111, *brevicornis*, Thoms. (*nec* Först.), renamed *parvicornis*, p. 118, *flavus*, Gimm., renamed *flavicans*, p. 125, *betulæ*, Hart. (*nec* Retz.), renamed *hartigi*, p. 127, *hypoleucus*, Costa (*nec* Först.) renamed *costæ*, p. 129, *erythrogaster*, Thoms. (*nec* Nort.), renamed *lxteogaster*, p. 132, *tibialis*, Nort. (*nec* Newm.), renamed *trivialis*, p. 140, *fulvipes*, Nort. (*nec* Fall), renamed *semirufus*, *crassus*, Esch. (*nec* Fall.), renamed *obtusus*, p. 148, *flavipes*, Zett. (*nec* Hart.), renamed *congener*, and *leucocarpus*, André (*nec* Hart), renamed *valesiacus*, p. 394; Kirby, l. c. *N. flavescens*, Steph.,

and *alienatus*, Först., figured and redescribed; *id. l. c.* pp. 125 & 138, pl. vii. figs. 93 & 13. *N. carinatus*, Hart., ♀ described; Cameron, Tr. E. Soc. 1882, p. 533. *N. ribesii*, Scop., noticed and figured; Bethune, Rep. E. Soc. Ont. 1881, pp. 79 & 80, figs. 47–49.

Nematus breadalbanensis, p. 531, *caledonicus*, p. 533, *collinus*, p. 534, *glenelgensis*, p. 535, *glottianus*, Scotland, p. 536, *v-flavum*, England, *pulchellus*, Scotland, p. 537, *maculiger* (= *lacteus*, var. b., Thoms.), England, Scotland, p. 538, *oblongus*, England, p. 539, and *thomsoni* (= *hyperboreus*, Cam., *nec* Thoms.), Braemar, p. 540, Cameron, Tr. E. Soc. 1882; *N. glutinosæ*, Scotland, Worcester, and *salicivorus*, Clydesdale, Worcester, *id.* Ent. M. M. xviii. pp. 193 & 194; *N. viridissimus*, Möller, Ent. Tidskr. iii. p. 179, Sweden; *N. glaphyropus* (Zadd., MS.), Dalla Torre, Ber. Ver. Innsbr. xii. p. 70, Tyrol; *N. gelidus* (= *N. brachyacanthus*, Thoms., var. *palliditarsus*, Cam., *cf.* p. 393), fig. 10, Spitzbergen, p. 115, *inconspicuus*, fig. 12, New York, p. 141, *extraneus*, fig. 14, Hudson's Bay, p. 142, *calais*, fig. 11, Mackenzie River, p. 144, *castaneus*, fig. 16, *neglectus*, fig. 15, p. 147, and *trifurcatus*, fig. 17, Hudson's Bay, p. 148, Kirby, List Hym. i. pl. vii.; *N. fulvicrus*, Provancher, Nat. Canad. xiii. p. 291, Canada; *N. cretaceus*, Fritsch, Beitr. Pal. Öst.-Ungarns, ii. p. 6, pl. ii. figs. 4–6 (fossil): spp. nn.

Cryptocampus distinctus, sp. n., Costa, Rend. Acc. Nap. xxi. p. [illegible], note, Sardinia.

Dineura (*Hemichroa*) *americana*, sp. n., Provancher, Nat. Canad. xiii. p. 292, Canada.

Selandriinæ.

The following known species are redescribed and figured (Kirby, List Hym. i.):—*Monophadnus japonicus*, Mocs., fig. 5, *rufus*, Cam., fig. 6, p. 174, *cærulescens*, Cam., fig. 8, p. 178, *Senocha cærulea*, Cam., figs. 20 & 21, *purpurata*, Smith, fig. 19, p. 181, *Eriocampa bengalensis*, Cam., fig. 17, p. 185, *Monostegia antipoda*, Kirby, fig. 3, p. 186, and *Selandria dorsalis*, Steph., fig. 15, p. 187.

Blennocampa cinereipes, Klug, noticed; Costa, Atti Acc. Nap. ix. 6, p. 43.

Hoplocampa fulvicornis, Fabr. (*nec* Panz.), renamed *fabricii*; Kirby, *l. c.* p. 167.

Selandria cerasi noticed and figured; Bethune, Rep. E. Soc. Ont. 1881, pp. 81 & 82, fig. 50. *S. fulvicornis*, Prov., = *halcyon*, Harr.; Provancher, *l. c.* p. 293.

Xenapates, g. n., Kirby, List Hym. i. p. 180. Affinities doubtful; general appearance of *Monophadnus*, head extended behind the eyes as in *Strongylogaster*. Type, *Dineura* (?) *africana*, Cam., redescribed and figured; *l. c.* pl. viii. fig. 2.

New species :—

Blennocampa formosella, Costa, Rend. Acc. Nap. xxi. p. 198, note, Sardinia; *B. obscura*, Kirby, *l. c.* p. 163, pl. viii. fig. 1, Santarem; *B.* (*Monophadnus*) *sulcata*, Cameron, Ent. M. M. xviii. p. 271, and Mon. Brit. Phyt. Hym. i. p. 236, York, Germany.

Hoplocampa calceolata, Costa, Atti Acc. Nap. ix. 6, p. 40, Calabria; *H.* (?) *atriceps*, Kirby, *l. c.* p. 168, pl. viii. fig. 18, Georgia.

Monophadnus lewisi, fig. 4, Hiago, p. 174, *hudsonicus*, fig. 7, p. 176, *lineatus*, fig. 9, pl. viii., Hudson's Bay, *scutellatus*, pl. vii. fig. 18, Mexico, p. 177, *erebus*, fig. 10, Mexico, South America, *thoracicus* (nec Tischb., renamed *amazonicus*, p. 398), fig. 12, Amazons, p. 178, *punctatus*, fig. 11, *paranus*, fig. 13, Para, *batesi*, fig. 14, pl. viii., Amazons, p. 179, *id. l. c.*

Selandria diversipes, fig. 22, p. 189, *glabra*, fig. 23, *inconspicua*, fig. 24, pl. viii. Mexico, *tripunctata*, fig. 3, p. 190, *batesi*, figs. 1 & 2, pl. ix., and *antennata*, pl. viii. fig. 16, Amazons, p. 191, *id.* l. c.; *S. paupera*[-*per*], Provancher, Nat. Canad. xiii. p. 293, Canada.

Phyllotominæ.

Phyllotoma aceris, Kalt. Habits and transformations described; Ritzema Bos, Tijdschr. Ent. xxv. pp. 7–16, pl. iii.

Aphadnurus tantillus, Costa, noticed by him; Atti Acc. Nap. ix. 6, p. 44.

Cœnoneura dahlbomi, Thoms. (*nec* André), = *Heptamelus ochroleucus*, [illegible] (? Steph.); *Strongylogaster viridis*, Schmied., = *delicatulus*, Klug; *S.* [illegible]*macula*, Klug, recorded as British: Cameron, Ent. M. M. xviii. p. 272.

Fenella westwoodi, sp. n., *id.* Mon. Brit. Phyt. Hym. i. p. 289, Bishopton, Durham.

Emphytinæ.

The following known species are redescribed and figured (Kirby, List Hym. i. pl. ix.):—*Emphytus fuscipennis* and *nigro-cœruleus*, Smith, figs. 5 & 6, p. 203, *Harpiphorus vexator*, Smith, fig. 4, p. 205, *Strongylogaster iridipennis*, Smith, fig. 8, p. 213.

Emphytus tibialis, Panz. (*nec* De Vill.), renamed *panzeri*, p. 200, *E. coxalis*, Motsch. (*nec* Klug), renamed *japonicus*, p. 203, and *E. pallipes*, Prov. (*nec* Spin.), renamed *canadensis*; Kirby, List Hym. i. p. 204.

Emphytus carpini, Hart., noticed; Costa, Atti Acc. Nap. ix. 6, p. 43. *E. grossulariæ*, Klug, noticed; Lucas, Bull. Soc. Ent. Fr. (6) ii. p. cv.

Pœcilosoma nigricolle, sp. n., Cameron, Mon. Brit. Phyt Hym. i. p. 218, Dumfries-shire.

Taxonus robustus, sp. n., Provancher, Nat. Canad. xiii. p. 294, Canada.

Strongylogaster politus and *soricalatus*, spp. nn., *id. l. c.* pp. 294 & 296, Canada.

Dolerinæ.

Dolerus subfasciatus, Smith, fig. 13, *ephippiatus*, Smith, fig. 10, p. 229, *affinis*, Cam., fig. 12, p. 230, and *rufo-cinctus*, Cam., fig. 9, p. 233, redescribed and figured; Kirby, List Hym. i. *D. famosus*, Eversm. (*nec* Steph.), renamed *eversmanni*, p. 223, *D. famosus*, Zadd., renamed *zaddachi*, p. 225, *D. similis*, Freym. (*nec* Nort.), renamed *mocanna*, p. 228; *id. l. c.*

Dolerus possilensis, Cameron, Mon. Brit. Phyt. Hym. i. p. 178, Glasgow; *D. japonicus*, Hiogo, and *cameroni* (= *bicolor*, Cam., *nec* Beauv.), Shanghai, Kirby, List Hym. i. pp. 228 & 229, pl. ix. figs. 7 & 11, spp nn.

Athaliinæ.

Athalia annulata, Klug (?) : larvæ noticed; Anderson, Ent. xv. p. 63. *A. proxima*, Klug (= *tibialis*, Cam.), redescribed and figured ; Kirby, List Hym. i. p. 235, pl. ix. fig. 14.

Tenthredinidæ.

The following known species are redescribed and figured (Kirby, List Hym. i.) :—*Allantus trochanteratus*, Cam., fig. 10, p. 249, *Siobla ruficornis*, Cam., figs. 16 & 18, p. 250, *pacifica*, Smith, fig. 17, *flavipes*, Smith, fig. 22, p. 251, *ferox*, Smith, fig. 20, *incerta*, Cam., fig. 15, pl. ix. p. 252, *Allomorpha incisa*, Cam , fig. 22, p. 254, *Beleses stigmaticalis*, Cam., fig. 21, pl. x. p. 255, *Macrophya blanda*, Fabr., pl. xvi. fig. 7, p. 256, *M. ignava*, Smith, fig. 4, p. 266, *luctifera*, Smith, fig. 8, *carbonaria*, Smith, fig. 6, *timida*, Smith, fig. 7, p. 267, *apicalis*, Smith, fig. 9, *flavo-maculata*, Cam., fig. 10, p. 268, *nigro-picta*, Smith, fig. 12, p. 269, *Pachyprotasis erratica* and *volatica*, Smith, figs. 16 & 17, pl. xv. p. 278, *Tenthred[in]opsis fulviceps*, Steph., figs. 8 & 9, *tristis*, Steph., figs. 10 & 11, p. 282, *neglecta*, Steph., figs. 12 & 13, pl. xvi. p. 284, *irritans*, Smith, pl. x. fig. 11, p. 285, *Tenthredo caliginosa*, Steph., pl. xvi. fig. 14, p. 289, *adusta*, Motsch. (= *erratica*, Smith), fig. , p. 303, *xanthotarsus*, Cam., fig. 4, *providens*, Smith, fig. 6, p. 304, *hilaris*, Smith, fig. 7, *xanthopus*, Cam., fig. 12, p. 305, *amoorensis*, Cam., fig. 16, p. 306, *trimaculata*, Cam., fig. 19, p. 307, *latifasciata*, Cam., fig. 15, *indica*, Cam., fig. 18, *melanotarsus*, Cam., fig. 10, p. 321, *xanthoptera*, Cam., fig. 13, pl. xi., *clypeata*, Cam., fig. 5, p. 322, *coccinoceras*, Wood, fig. 11, pl. xii. p. 323.

Macrophya lineata, Mocs. (*nec* Nort.), renamed *mocsarii*, p. 401, *Tenthredo leucostoma*, Rudow (*nec* W. Kirby), renamed *sylvia*, p. 292, *fallax*, Mocs. (*nec* Smith) renamed *menetriesi*, p. 296 (previously renamed *mocsarii* by André, *cf.* p. 402), *id. l. c.*

Perineura scutellaris, Panz., var. *flavo-guttata* noticed ; Magretti, Bull. Ent. Ital. xiv. p. 241.

Macrophya albo-annulata, Costa, recorded as new to Belgium ; Jacobs, CR. Ent. Belg. xxvi. p. cxlv.

Tenthredo fallax, Mocs., *nec* Smith, renamed *mocsarii* ; André, Spec. Hym. i. p. 599.

Tenthred[in]opsis. Table of species, after Cameron ; Dalla Torre, Ent. Nachr. viii. pp. 169–171.

Tenthred[in]opsis idriensis, Gir., recorded as new to Belgium ; *Tenthredo nebulosa*, Lep., = *pallicornis*, Fabr., and *T. trichocera*, Lep., = *aterrima*, Klug ; Puton, CR. Ent. Belg. xxvi. p. clxxii.

New genera and species :—

Ametastegia, Costa, Rend. Acc. Nap. xxi. p. 198, note. Allied to *Perineura* ; body long, depressed; antennæ setaceous, nine-jointed; fore-wings with two radial and four cubital cells, lanceolate cell with transverse cross-nervure; hind-wings with no discoidal cell and anal cell shortly appendiculate. Type, *A. fulvipes*, sp. n., *ibid.*, Sardinia.

Dipteromorpha, Kirby, List Hym. i. p. 324. Affinities uncertain; antennæ, legs, wings, and abdomen long and narrow. Type, *Macrophya rotundiventris*, Cam., redescribed and figured, *l. c.* pl. xiii. figs. 1 & 1*a*.

Hypolopus, id. *l. c.* Affinities uncertain ; shape of *Tenthredo*, but with some affinities to the *Nematinæ*. Type, *H. abboti*, sp. n., *l. c.* p. 325, pl. xiii. fig. 2, Georgia.

Aglaostigma, id. *l. c.* p. 325. Affinities uncertain ; type, *A. eburneiguttatum*, sp. n., *l. c.* pl. xiii. figs. 3 & 3*a*, Angara.

Siobla robusta, id. *l. c.* p. 253, pl. ix. fig. 21, Georgia.

Pachyprotasis versicolor, id. *l. c.* p. 279, pl. x. fig. 20, North India.

Macrophya hartigi, fig. 1, Albania, p. 260, *corynetes*, fig. 3, p. 264, *lucasi*, fig. 2, *cognata* (nec Mocs., renamed *jugurtha*, p. 401). fig. 5, Algeria, p. 265, *abboti*, fig. 14, Georgia, p. 269, *zoe*, fig. 15, Hudson's Bay, p. 270, *albifacies*, fig. 18, p. 271, *cassandra*, fig. 13, New York, p. 273, and *pulcherrima*, fig. 19, Florida, p. 275, *id. l. c.* pl. x.

Tenthred[in]opsis nigropectus[nigri-], id. *l. c.* p. 285, pl. xi. fig. 1, Tokio.

Tenthredo scotica, Cameron, Ent. M. M. xviii. p. 193, Dumfries ; *T. rejecta* and *simplex* (Zadd., MS.), Dalla Torre, Ber. Ver. Innsbr. pp. 71 & 72, Tyrol ; *T. jocosa*, Provancher, Nat. Canad. xiii. p. 298, Canada ; *T. finschi*, pl. xvi. fig. 5, Siberia, p. 302, *fentoni*, fig. 2, p. 304, *varipes*, fig. 5, Japan, p. 305, *eburneifrons*, fig. 3, Amur, p. 306, *fortunii* (= *obscura*, Fall., *nec* Panz.), fig. 11, pl. xi., Shanghai, *antennata*, fig. 1, Nova Scotia, *pericollis*, fig. 3, Newfoundland, p. 308, *thora*, fig. 2, p. 310, *subrufescens*, fig. 4, p. 311, *zetes*, fig. 6, p. 312, *barnstonii*, figs. 9 & 10, Hudson's Bay, p. 314, *cressoni*, fig. 12, Hudson's Bay, Nova Scotia, *vapida*, fig. 7, pl. xii. p. 315, *uniformis*, pl. xi. fig. 14, p. 317, *hudsoni*, fig. 15, *borealis*, fig. 13, p. 318, *vittata*, fig. 14, *castanea*, fig. 17, Hudson's Bay, p. 319, *T.* (?) *aperta*, fig. 16, pl. xii., Mexico, *T. smithi*, pl. xi. fig. 9, India, p. 320, and *T.* (?) *delicatula*, pl. xii. fig. 8, Venezuela, p. 323, Kirby, *l. c.*

Waldheimia batesi, id. *l. c.* p. 327, pl. xiii. fig. 4, Para.

Lydinæ.

The following known species are redescribed and figured (Kirby, List Hym. i. pl. xiii.) :—*Megalodontes fabricii*, Leach, fig. 5, p. 329, *Pamphilius sylvarum*, Steph., (= *fulvipennis*, Zadd.), fig. 6, p. 336, *flagellicornis*, Smith, fig. 9, p. 341, *venustus*, Smith, fig. 11, *volatilis*, Smith, fig. 13, p. 342, and *rileyi*, Cress., fig. 8, p. 350.

Lyda semicincta, Zadd., *nec* Nort., renamed *Pamphilius hypocinctus*; id. *l. c.* p. 403.

Pamphilius flavifrons, fig. 7, Amur, p. 341, *smithi* (= *latifrons*, Smith, *nec* Fall.), fig. 14, Japan, *sulphureipes*, fig. 12, Amur, p. 343, and *mathematicus*, fig. 10, Nova Scotia, p. 348, *id. l. c.* pl. xiii., spp. nn.

Xyelinæ.

Macroxyela, g. n., Kirby, List Hym. i. p. 351. Allied to *Xyela*, but much larger; type, *X. ferruginea*, Say (redescribed and figured, *l. c.* pl. xiv. fig. 1).

Cephinæ.

The following known species are redescribed and figured (Kirby, List Hym. i. pl. xiv.) :—*Cephus linearis*, Schrank, fig. 7, *pygmæus*, L., figs. 5 &

6, p. 357, *phthiscus*, Fabr., fig. 3, p. 360, *viator* and *agilis*, Smith, figs. 8 & 4, p. 362.

Cephus pygmæus injurious to barley, its attacks rendering the straw very unwholesome for cattle; Hor. Ent. Ross. xvi. p. xiii. *C. inf[latus]*, André (*nec* Thoms.), renamed *andreæ*[*-dræi*], p. 360, and *C. abdominalis*, Cress., *nec* Latr., renamed *cressoni*, p. 403, Kirby, *l. c.*

Cephus quadriguttatus and *flavisternum*, Costa, Rend. Acc. Nap. xxi. p. 198, note, Sardinia; *C. mocsarii*, Kirby, *l. c.* p. 356, pl. xiv. fig. 2, Hungary: spp. nn.

LEPIDOPTERA.

BY

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

The General Subject.

Aurivillius, P. O. C. Recensio critica Lepidopterorum Musei Ludovicæ Ulricæ, quæ descripsit Carolus a Linné. Sv. Ak. Handl. xix. 5, pp. 188, coloured plate and woodcuts.

Contains full synonymy, and critical observations on all the species, and must be regarded as a highly important contribution to Entomological Bibliography.

Barrett, C. G. The influence of meteorological conditions on Insect Life. Ent. M. M. xix. pp. 1–8.

Relates to the influence of wind and rain, cold and mild winters, &c., on *Lepidoptera*.

Burgess, E. Note on the aorta in Lepidopterous Insects. P. Bost. Soc. xxi. pp. 153–156, woodcuts.

In the Butterflies, a distinct horizontal aortal chamber is present; in the higher Moths (except the Hawk-moths, which exhibit a peculiar structure not yet fully investigated), a vertical node replaces the chamber, and this vanishes in the lower Moths.

Butler, A. G. Notes on certain *Microlepidoptera*. Ent. M. M. xix. pp. 106–108.

Consists of synonymic notes, too numerous for reproduction, on various genera and species described by Zeller in Hor. Ent. Ross. xiii.

Christoph, H. Neue Lepidopteren des Amurgebietes (Fortsetzung). Bull. Mosc. lvi. 4, pp. 405–436, and lvii. 1, pp. 5–47.

Extends from *Eudemis* to *Aciptilia*. A list of the new species described is added.

Dewitz, H. Beschreibungen von Jugendstadien exotischer Lepidopteren. Verh. L.-C. Ak. xliv. pp. 247–271, pls. viii. & ix.

Transformations of 25 Tropical American and East Indian species noticed.

Farn, A. B. On the Diseases of Lepidopterous larvæ. Ent. xv. pp. 73–75.

Relates to "pébrine" and "flaquerie."

Gauchler, H. Untersuchungen über beschleunigte Ueberwinterung von Schmetterlingspuppen. Ent. Nachr. viii. pp. 36–38, 171 & 172.

Kane, W. F. de V. Causes of abundance or otherwise of *Lepidoptera*. Ent. xv. pp. 244–246.

Meldola, R. Mimicry between Butterflies of Protected Genera. Ann. N. H. (5) x. pp. 417–425.

The writer discusses the general question of mimicry, and agrees with F. Müller that the rarer of two mimicking species is always the mimic, and with Darwin that in the case of allied forms, the tendency to mimicry has been increased by blood-relationship.

Müller, F. Bemerkenswerthe Fälle erworbener Aehnlichkeit bei Schmetterlingen. Kosmos, x. pp. 257–267, pl. vi.

The writer thinks that it is necessary for insectivorous animals to test the edibility of Butterflies individually; and that mimicked species probably appear on the wing some time before the mimics, so that their enemies have already had time to discover the inedibility of the former by experience.

Pagenstecher, A. Ueber Zwitterbildungen bei Lepidopteren. JB. nass. Ver. xxxv. pp. 88–101, plate.

Hermaphrodites of *Sphinx convolvuli*, L., *Saturnia pavonia*, L. (= *carpini*, W. V.) and *Rusina tenebrosa*, Hübn., are described and figured. General remarks on hermaphroditism, and notes on previously observed hermaphrodites of *S. convolvuli* and *S. pavonia* are appended.

Polatejew, N. Des muscles d'aile chez les Lépidoptères Rhopalocères. Hor. Ent. Ross. xvi. pp. xiv. 436 & 437; Troudy Ent. Ross. xiii. pp. 10–17, pl. ii.

As in most other insects, the alary muscles of *Lepidoptera* form three groups:—(1) A median dorsal muscle (generally double), which runs upwards longitudinally in the mesothorax, and depresses the wings; (2) the lateral dorso-ventral muscles of the meso- and metathorax, which are situated close to the sides, and are fixed above to the articulation of the wings, which they serve to depress; (3) middle dorso-ventral muscles, which are situated between the dorsal and lateral muscles, and are fixed

above to the inside of the upper surface of the body, and below to the coxæ and the interior of the sternum: these serve to raise the wings. Only two muscles are attached above to the wings by tendons. The axis of rotation of the wings runs parallel to the axis of the body.

SCUDDER, S. H. Fragments of the coarser anatomy of Diurnal *Lepidoptera* (concluded). Psyche, iii. pp. 296–298, 307–309, & 319–321. (Also issued complete. Cambridge, Mass.: 1882, 12mo, pp. 83.)

Relates to *Hamadryas io* (pupa), *Callophrys rubi* (larva), *Eurymus philodice* (larva), *Euphœdes troilus* (larva), and *Epargyreus tityrus* (larva).

SELVATICO, S. Sullo sviluppo embrionale del Bombicini. Bull. di Bachicultura, viii. (Padova, 1881) pls. vii. (*Cf.* Bull. Ent. Ital. xiv. pp. 250 & 251.)

The author compares the development of the egg of *Bombyx mori*, *Attacus mylitta*, and *Saturnia pyri*. At the end of winter, the constituents of the egg are as follows:—(1) A solid shell, to which an opaque layer, a kind of curd, adheres internally; (2) a very transparent substance, regarded by some as a secretion of the blastoderm; (3) serous involucrum, membrane composed of large flat polygonal, pigmented, and nucleated cells; (4) nutritive yelk, broken into large spheres containing one or more protoplasmic nuclei; (5) germinative pellicle, with the ventral surface turned outwardly, and containing the amnios. This last resembles the membrane of the serous involucrum, but the cells are without pigment.

SWINTON, A. H. A Physiological Arrangement of *Lepidoptera*. Naturalist, vii. pp. 45–47.

The following arrangement of *Macrolepidoptera* is suggested:—*Noctuina*, *Bombycina*, *Geometrina*, *Rhopalocera*, *Sphingina*. *Hepialus*, *Coleophora*, and the *Psychidæ* are considered to be archaic forms.

W. F. Kirby has published one instalment of his "Introductory Papers on *Lepidoptera*: *Nymphalidæ*-*Nymphalinæ*" (continued); Ent. xv. pp. 157–159.

List of *Lepidoptera* reared in the Insect House at the Zoological Society's Gardens in 1881; Sclater, Rep. Brit. Ass. li. p. 669. Notes upon them; Thomas, P. Z. S. 1882, pp. 622 & 623.

On mimicry in Butterflies, &c., Wallace, Kosmos, xi. pp. 380–383; Nature, xxvi. pp. 86 & 87; Aurivillius, Ent. Tidskr. iii. pp. 195, 196, 213 & 214.

On the occurrence of certain species of *Lepidoptera* in widely separated localities; Snellen, Tijdschr Ent. xxv. pp. cxxvii.–cxxix.

Plea for the preservation of the larvæ of harmless *Lepidoptera*; Kühnan, JB. schles. Ges. lix. pp. 375–380.

Destruction of *Lepidoptera* by rain; Barrett, Ent. M. M. xix. p. 90.

On the oviposition of *Lepidoptera*, with special reference to *Tephrosia crepuscularia* and the *Liparidæ*; Chrétien, Le Nat. ii. pp. 140–142 (*cf.* also Lelièvre, *op. cit.* p. 150, and Chrétien, pp. 165 & 166).

Preliminary notes on the length of life of *Sphinges*, *Bombyces*, and *Noctuæ*, in the perfect state; Lintner, P. Am. Ass. xxx. pp. 268 & 269.

Moths attracted by the gleam of falling water; Gardner, Nature, xxv. p. 436.

Observations on the comparative anatomy of the male organs of *Rhopalocera*; Cholodkoffsky, Troudy Ent. Ross. xiii. pp. 3–9, pl. i., and Hor. Ent. Ross. xvi. p. xv.

On the colouring matter and secretions of the silk-spinning *Lepidoptera*; Hellins, Ent. M. M. xviii. pp. 260 & 261.

Impression of Butterflies on paper; McLachlan, P. E. Soc. 1882, p. iii.

Vanessa io and *urticæ*, and *Erebia medea*. Position on emerging from the pupa; Pierce & Anderson, Ent. xv. pp. 260 & 261.

Dead larva with a fungus (*Torrubia*) growing from it; Flemyng, Ent. xv. pp. 91 & 92.

Trout refusing bright-coloured and hairy caterpillars; Weir, P. E. Soc. 1882, p. xix.

Damping pupæ of *Lepidoptera*; Vandenbergh, Sci. Goss. xviii. pp. 178, 179, 202, 203, & 232.

Setting *Lepidoptera*; Sci. Goss. xviii. pp. 141, 142, & 225.

On the best means of discovering the larvæ of Butterflies; Boochárkossy, Ent. Nachr. viii. pp. 99 & 100.

On preserving larvæ; Bull. Soc. L. Nord Fr. v. pp. 179 & 180; Ent. Nachr. viii. pp. 192 & 193; S. E. Z. xliii. pp. 390 & 391.

Grote criticises the works of Guénée and Walker on Moths; Canad. Ent. xiv. pp. 46 & 47. He also discusses the laws of nomenclature, with special reference to *Lepidoptera*, and proposes to ignore *Eudæmonia jehovah*, Streck.; *l. c.* pp. 128–130.

Omissions from and corrections of the *Lepidoptera* in Scudder's Nomenclator Zoologicus; *id. l. c.* pp. 116–118.

Butler proposes to place the *Cossidæ*, *Psychidæ*, *Hepialidæ*, and *Castniidæ*, between the *Sphingidæ* and *Zygænidæ*; Tr. E. Soc. 1882, p. 3.

Europe.

Kirby, W. F. European Butterflies and Moths, based upon Berge's Schmetterlingsbuch. London: 1882, 4to, pp. *xvi.*, lvi., & 427, pls. 62 (61 coloured and 1 plain).

Includes a general introduction, and a full synopsis of all the European *Macrolepidoptera*, down to the end of the *Geometridæ* (one example at least of every genus being figured, frequently with their transformations). A short supplement on *Microlepidoptera* is added, illustrated by 2 plates.

Parts vii.–xi. of Lang's "Butterflies of Europe" (pp. 97–176, pls. xxxiii.–xliii.), and Parts xxv.–xxix. of Mosley's "Illustrations of European Butterflies," have appeared within the year.

British Isles and Scandinavia.

Weir, J. J. Notes on the *Lepidoptera* of the Orkney Islands. Ent. xv. pp. 1–5.

111 species enumerated (exclusive of *Tineina*) from the Island of Hoy, with remarks on the variation of some of the species. The writer thinks that the Færöe Islands should be treated geographically as belonging to Britain.

[Weir, J. J.] The *Macrolepidoptera* of the Island of Arran. *L. c.* pp. 250–253.

105 species noticed.

White, F. B. The *Lepidoptera* of Orkney, Shetland, and the Outer Hebrides. Scot. Nat. vi. pp. 289–291, & 337–344.

Compiled from J. J. Weir's papers in Ent. xiii.–xv.

S. L. Mosley has published Part xi. of his "Illustrations of Varieties of British *Lepidoptera*," representing varieties of *Lomaspilis marginata*, *Cidaria immanata*, *russata*, *sagittata*, *populata*, *corylata*, *fulvata*, and *suffumata*, and *Eubolia mensuraria*, *palumbaria*, and *lineolata*.

On the study of British *Lepidoptera*; Carrington, Ent. xv. pp. 111–114.

Comparison of Scandinavian and Scottish *Lepidoptera*; Schöyen, N. Mag. Vidensk. xxvii. pp. 7–13, and Ann. N. H. (5) x. pp. 475–477.

Captures of Moths by the electric light; Dewey, Ent. xv. pp. 21 & 22.

Captures at ivy; Lubbock & Macmillan, Ent. xv. pp. 42 & 43.

On the *Lepidoptera* of Hackney Marshes; Anderson, Ent. xv. pp. 271–274.

Notes on the *Lepidoptera* of West Norfolk; Atmore, Ent. M. M. xviii. pp. 239–244, xix. pp. 165 & 166.

Catalogue of the *Lepidoptera* of Northampton; Wake, Hull & Tomalin, J. Northampton Soc. i. pp. 56, 57 & 327, and ii. pp. 118–123, & 166–171. (Extends at present to the genus *Rusina*.)

On the *Lepidoptera* of the Isle of Purbeck; Parmiter, Ent. xv. pp. 15 & 16.

List of *Macrolepidoptera* observed in Yorkshire in 1879 and 1880, with notes on varieties, &c.; Porritt, Tr. Yorkshire Union, iv. pp. 81–91.

Captures at Dover, p. 15, Lincoln, pp. 37–39, New Forest, pp. 51–53, Llandudno, pp. 64 & 65, Marlborough, pp. 68 & 69, Dublin, p. 69, Romsey, p. 116, Witherslack, pp. 125–127, Norfolk, pp. 134 & 135, Northampton, pp. 136 & 137, North Devon, pp. 153–157, Folkestone, pp. 196–199, Polegate, pp. 233 & 234, Wales, pp. 255 & 256, Scotland, pp. 256 & 257, Ben Tigh, pp. 269–271, Ent. xv.; Roxburghshire, Ent. M. M. xviii. pp. 209 & 210; Bradford, Naturalist, vii. pp. 137–140; New Forest, P. R. Phys. Soc. Edinb. 1881 & 1882, pp. 214–221.

List of 52 *Lepidoptera* captured in Tanadalen in July, 1879; Schneider, Forh. Selsk. Chr. 1881, 2, pp. 11–21.

List of 20 *Lepidoptera Heterocera* new to Norway; *id. l. c.* pp. 1–6. 37 more species added; Schöyen, *op. cit.* 13, pp. 1–11.

France.

Dubus, J. F. Faune lépidopterologique de l'arrondissement de Saint-Quentin: Catalogue méthodique de Lépidoptères, 3 fasc. Saint-Quentin: 1882, 8vo, pp. 109–177.

[Not seen by the Recorder.]

Von Nolcken, J. H. W. Lepidopterologische Notizen. S. E. Z. xliii. pp. 173–201 & 517–523.

Observations at Cannes; the most important will be noticed in their places.

Captures in the Department of Eure, pp. 7–9; Rouen, pp. 33 & 34, Paris, p. 45, Feuill. Nat. ii.; South France, Rev. d'Ent. i. pp. 139 & 140; Pyrenees, S. E. Z. xliii. pp. 393–405 & 410–429.

Notes on *Lepidoptera* at Hyères; Bellier de la Chavignerie, Rev. d'Ent. i. pp. 116, 117, 143, & 144.

Ravages of larvæ in the forest of Sévres; Clère, Le Nat. ii. p. 94.

Undetermined moth at Cannes simulating a leaf; Duke of Argyll, Nature, xxvii. pp. 125 & 126.

Italy.

Curò, A. Saggio di un Catalogo dei Lepidotteri d'Italia. Aggiunte alle Pyralidine e Tortricine. Bull. Ent. Ital. xiv. pp. 151–153.

Holland and Belgium.

Donckier de Donceel, C. Catalogue des Lépidoptères de Belgique. Ann. Ent. Belg. xxvi. pp. 5–161.

Snellen, P. C. T. De Vlinders van Nederland. Microlepidoptera, systematische beschreven. 2 Deelen. Leiden: 1882, 8vo, pp. xiv. & 1196, pls. xiv.

The total number of *Pyralidina*, *Tortricina*, *Tineina*, *Pterophorina*, *Alucitina*, and *Micropterygina* described as belonging to the Dutch fauna in this elaborate work is 918. The plates represent generic details. A supplement to the author's previous volume on *Macrolepidoptera* is likewise appended. Tables of families, genera, and species are given throughout, in addition to elaborate descriptions, including the transformations of the various species. In the case of some of the variable *Tortrices* even the varieties are tabulated. Species likely to occur in Holland are mentioned in the notes.

Localities for various Belgian *Lepidoptera*; Lallemand, CR. Ent. Belg. xxvi. pp. ci. & cii.

Germany, Switzerland, Austria, &c.

Freyer, H. Zweiter Nachtrag zur Lepidopteren-Fauna der Schweiz. MT. schw. ent. Ges. vi. pp. 349–375.

130 species enumerated, including several new *Tineidæ*.

Höfner, G. Die Schmetterlinge des Lavantthales und der beiden Alpen "Kur- und Saualpe," ii. Nachtrag. JB. Mus. Kärnthen, xv. pp. 193–200.

Lang, H. C. The Moths and Butterflies of Switzerland, and how to collect them. (Muddock's "The Alps, and how to See them," pp. xc.–cxvi.)

A good popular treatise for the use of tourists.

Sorhagen, L. Aus meinem entomologischen Tagebuche. B. E. Z. xxvi. pp. 129–158.

Includes notes on 73 *Microlepidoptera*, the most important of which will be noticed in their places.

Derivation of the names of German *Rhopalocera* ; Glaser, Ent. Nachr. viii. pp. 303–317.

List of *Macrolepidoptera* of Epirus ; Haas, JB. Karpath. Ver. vii. pp. 238–302.

List of Butterflies and *Sphinges* of Heligoland ; Gätke & Selys-Longchamps, Bull. Soc. Z. Fr. vii. pp. 278 & 279, and Ent. M. M. xix. pp. 164 & 165.

Contributions to the Lepidopterous Fauna of the Mangfall district in the south of Upper Bavaria ; Gumppenberg, S. E. Z. xliii. pp. 489–491.

Captures of *Bombyces*, *Noctuæ*, and *Geometræ* at sugar in Hungary ; Von Hutten-Klingenstein, S. E. Z. xlvii. pp. 202–208.

Five *Lepidoptera* new to Hungary recorded from Mehadia ; J. Pavél, Term. füzetek, v. pp. 197 & 277.

On the *Lepidoptera* of the Forest of Mombach ; Ent. Nachr. viii. pp. 265–270, 289–292, & 297–299.

Additions to list of *Macrolepidoptera* of Neu-Vorpommern and Rügen ; Plötz, MT. Vorpomm. xii. pp. 78–80. Captures on the borders of Pomerania ; Stauge, S. E. Z. xliii. pp. 516 & 517.

Captures of *Lepidoptera* near Sarajevo ; Mitis, Wien. ent. Z. i. p. 22.

Möschler reviews Rössler's writings on the *Lepidoptera* of Wiesbaden and discusses the classification of *Lepidoptera* generally ; S. E. Z. xliii. pp. 492–508.

Catalogue of *Microlepidoptera* of Würtemberg; Steudel & Hofmann, JH. Ver. Württ. xxxviii. pp. 143–262.

Supplementary notes on various moths of the Upper Albula ; Zeller, JB. Ges. Graub. xxv. pp. 22–28.

Russia.

Captures of *Lepidoptera* in Livonia in 1881 ; Teich, S. E. Z. xliii. pp. 213–216.

Catalogue of *Lepidoptera* of the Government of Moscow (1172 species); Albrecht, Bull. Mosc. lvi. 4, pp. 372–404.

Catalogue of *Lepidoptera* of the neighbourhood of St. Petersburg ; Erschoff, Troudy Ent. Ross. xii. 199–221. (1308 species recorded.)

List of *Macrolepidoptera* of the Crimea ; *op. cit.* xiii. pp. 153–168.

Teneriffe.

Christ, —. Die Tagfalter und Sphingiden Teneriffa's. MT. schw. ent. Ges. vi. pp. 333–348.

22 species enumerated, with general and special observations, viz., *Pieris chiranthi*, Hübn., *rapæ* and *duplidice*, L., *Colias edusa*, Fab., and var. *helice*, Hübn., *Rhodocera cleobule*, Hübn., *Vanessa huntera*, Fabr., *cardui*, L., *callirrhoe*, Hübn. (var. *vulcania*, Godt.), *Argynnis pandora*, Schiff., *Danais chrysippus*, L., *Pararge egeria*, L., var. *xiphioides*, Staud., *Epinephile janira*, L., var. *hispulla*, Hübn., *Polyommatus phlæas*, L., *Lycæna bætica*, L., *webbiana*, Brullé (= *fortunata*, Staud.), *lysimon*, Hübn., *astrarche*, Bergstr. (var. *æstiva*, Staud.), *Hesperia actæon*, Esp., *Sphinx convolvuli*, L. (var. *batatæ*), *Dilephila tithymali*, Boisd., and *celerio*, L., and *Macroglossa stellatarum*, L., *Argynnis lathonia*, *Satyrus fidia*, and

Sphinx ligustri, L., recorded by Brullé, and *Aporia crataegi*, *Vanessa c-album* and *urticæ*, *Thecla rubi*, L., and *Pterogon œnotheræ*, W.V., recorded by Staudinger (the three last with doubt), have not been received by the author.

Africa.

Snellen, P. C. T. Aanteekeningen over Afrikaansche *Lepidoptera*. Tijdschr. Ent. xxv. pp. 215–234.

Chiefly consists of short notes on known species.

Spiller, A. J. Notes on the *Lepidoptera* of Natal. Ent. xv. pp. 5–10.

A paper of a general character. The writer remarks that he has met with 192 species of *Rhopalocera*.

The following butterflies which pair together in Natal may be varieties of one species:—*Eurytela hiarbas* and *dryope* (of which an intermediate form occurs); *Charaxes zoolina* and *neanthes*; and *Junonia archesia* and *pelasgis*. *Salamis anacardii*, however, will pair with wholly different species, such as *Junonia archesia*, *Papilio merope*, and even *Aphelia apollinaris*: id. *l. c.* p. 9.

Asia.

Alphéraky, S. Lépidoptères du district de Kouldja et des montagnes environnantes. 1ère partie *Rhopalocera*. Hor. Ent. Ross. xvi. pp. 334–435, pls. xiv. & xv., and xvii. pp. 15–103, pls. i.–iii.

276 species noticed, as far as the *Deltoidæ*.

Butler, A. G. On *Lepidoptera* collected in Japan and the Corea by W. Wykeham Perry. Ann. N. H. (5) ix. pp. 11–20.

38 species mentioned. The Corean collection exhibits a curious assemblage of European, E. Siberian, and Japanese species.

——. On a small collection of *Lepidoptera*, principally from Candahar. *L. c.* pp. 206–211.

41 species enumerated.

Distant, W. L. Rhopalocera Malayana: a description of the Butterflies of the Malay Peninsula. London: 4to. Parts i.–iii. April, July, September, 1882, pp. 1–84, col. pls. xii., and woodcuts. [*Cf.* Nature, xxvi. pp. 6 & 7, and Ann. N. H. (5) x. pp. 171 & 172.]

A thoroughly critical and reliable work, embodying all available information on the subject. The woodcuts include structural details and larvæ, illustrations of sub-families and genera, and occasionally perfect insects. The sub-families are partially divided into groups ending in *-ina*; tables of genera are given under each. The author's remarks on scent-glands, mimicry, &c., will also be found interesting and instructive. The text already published extends to the *Morphina*, while the plates are considerably in advance. The notice of these last is necessarily deferred until the appearance of the text relating to them.

ELWES, H. J. On a Collection of Butterflies from Sikkim. P. Z. S. 1882, pp. 398–407, pl. xxv.

Most of the species enumerated are supposed to have been taken on the Tibetan side of the frontier.

MARSHALL, G. F. L., & NICÉVILLE, L. DE. The Butterflies of India, Burmah, and Ceylon. A descriptive Handbook of all the known species of Rhopalocerous *Lepidoptera* inhabiting that region, with notices of allied species occurring in the neighbouring countries along the border. With numerous illustrations. Vol. i. *Nymphalidæ*. Part i. *Danainæ*. Calcutta: 1882, 8vo, pp. vii. & 94, col. frontispiece, pls. i.–ix. (plain), and woodcuts.

Includes glossary of technical terms, preface, introduction, collecting and preserving, synopses of families and sub-families, and descriptions of Indian *Danainæ*. Plate i. represents neuration and external anatomy, and plate ii. represents larvæ; the remainder represent perfect insects. The species in each genus are tabulated, and altogether the value of the work to residents in India cannot well be over-estimated. Reviewed by Elwes, Nature, xxvii. pp. 50 & 51.

MOORE, F. The *Lepidoptera* of Ceylon. Parts v. & vi. (vol. ii. pp. 1–72, pls. lxxii.–cvii.) [*Cf.* Nature, xxv. pp. 32 & 79.]

Includes *Sphingidæ* to *Arctiidæ*.

——. Descriptions of new Indian Lepidopterous Insects in the collection of the late W. S. Atkinson. Part ii. HETEROCERA, continued (*Cymatophoridæ–Herminiidæ*). Calcutta: 1882, 4to, pp. 89–198, pls. iv. & v.

As before, only new species and genera will be noticed; but references to plate vi. (still unpublished) will be quoted, for convenience of reference.

——. List of the *Lepidoptera* collected by J. H. Hocking, chiefly in the Kangra District, N. W. Himalaya, with descriptions of new genera and species. Part i. P. Z. S. 1882, pp. 234–263, pls. xi. & xii.

Includes *Rhopalocera*. A few notes on habits are added.

PRYER, H. On certain Temperature Forms of Japanese Butterflies. Tr. E. Soc. 1882, pp. 485–491. (Discussion, P. E. Soc. 1882, pp. xvi. & xvii.)

The writer considers that many reputed species are only broods; that neither shape, size, nor colour can be relied on as sufficient guides for specific distinction, and that temperature has a great evolutionary effect on the character of insects.

STAUDINGER, D. Lepidopteren-Fauna Kleinasiens. Nachträge. Hor. Ent. Ross. xvi. pp. 65–135.

Includes notes on additional specimens from Amasia, a list of all the species (1974) found in Asia Minor, general remarks, tables of distribution, &c.

[Staudinger, D.] Beitrag zur Lepidopteren-Fauna Central-Asiens. Fortsetzung und Schluss. S. E. Z. xliii. pp. 35–78.

Extends from *Agrotis* to *Eupithecia*. The species noticed are chiefly from Lepsa, Saisan, Ala Tau, &c.

List of *Lepidoptera* collected by A. Carpenter at Yedo and Oosima; Butler, Ann. N. H. (5) x. p. 318.

Second list of diurnal *Lepidoptera* inhabiting the Nicobar Islands; Wood-Mason & De Nicéville, J. A. S. B. li. pt. 2, pp. 14–20, pl. iii. (71 species enumerated).

Capture of Butterflies at Barrackpore; Rothney, Ent. M. M. xix. pp. 33–36.

North America.

Butler, A. G. On the Butterflies collected by Lord Walsingham in California; J. L. S. xvi. pp. 462–474.

74 species enumerated.

Edwards, W. H. Notes on certain Butterflies, their habits, &c. Canad. Ent. xiv. pp. 21–28 & 49–56.

Relates to *Papilio philenor* (food-plant and oviposition), *P. machaon* (unsuccessful attempt at acclimatization), *Argynnis diana* and *cybele* (freezing the larvæ in winter renders them easier to rear afterwards; transportation of eggs and young larvæ), *Apatura flora* (irregularity of number of moults in larvæ), *Papilio ajax* (previous observations of Edwards summed up on young caterpillars eating their egg-shells), *Colias philodice* (albino females).

——. Description of species of Butterflies taken in Arizona by Jacob Dall, 1881. Papilio, ii. pp. 19–29.

60 species enumerated; the following known species are specially noticed or redescribed:—*Terias gundlachia*, Poey, *mexicana*, Boisd., *damaris*, Feld., *Phyciodes picta*, Edw., *Limenitis ursula*, Fabr., var. *arizonensis*, *L. weidemeyeri*, Edw., abb. without white band, *L. eros*, Edw., var. *obsoleta*, *Apatura leilia*, Edw., and *Thecla clytie*, Edw.

Grote, A. R. An illustrated Essay on the *Noctuidæ* of North America; with a colony of Butterflies. London: 1882, 8vo, pp. 85, pls. iv. [*Cf.* Nature, xxvi. pp. 500 & 501.]

Includes a preface, remarks on the structure and literature of the *Noctuidæ*, notes on some of Walker's types, and on 45 of Grote's species, here figured, and a discussion on the geographical distribution of *Œneis semidea*, Say.

——. New Check List of American Moths. May, 1882, 8vo, pp. 73.

Extends as far as the *Tortricidæ*, the list of this family being copied from Fernald. A few new genera are described, or new names substituted for old.

[Grote, A. R.] New Moths, with Partial Catalogue of *Noctuæ*. Bull. U. S. Geol. Surv. vi. pp. 563–578.

Includes additions to the list of American species of *Agrotis* and *Botis*, and a list of *Noctuæ* belonging to the *Dicopinæ* and *Bombycoidea*, with remarks on various undetermined species, &c.

Part x. of the Second Series of Edwards's "Butterflies of North America" has appeared in 1882, to which is appended the commencement of a synopsis of North American Butterflies, revised and brought down to 1882. This first instalment extends to *Argynnis*.

List of Butterflies collected by the Howgate Polar Expedition in 1877–1878; W. H. Edwards, Bull. U. S. Nat Mus. xv. [1879] pp. 155–157. (*Colias hecla*, *Argynnis freya* and *polaris*, and *Chionobas semidea* noticed.)

Notes on Butterflies taken in California, &c., in 1876; Osten-Sacken, Papilio, ii. pp. 29–31.

List of Butterflies captured by H. K. Morrison in Dacota and Montana in 1881; W. H. Edwards, Canad. Ent. xiv. p. 6.

Notes on Butterflies in Monroe County, New York; Bruce, Papilio, ii. p. 188

List of *Lepidoptera* (72 *Rhopalocera*, 463 *Heterocera*, to end of *Geo*[illegible] *tridæ*) taken near Dayton, Ohio; Pilate, Papilio, ii. pp. 65–72.

Scudder's Butterflies reviewed; Nature, xxv. pp. 5 & 6, and Rep. E. Soc. Ont. 1881, p. 34.

South and Central America.

Berg, C. Farrago Lepidopterologica. Contribuciones al estudio de la Fauna Argentina y Paises Limitrofes. An. Soc. Arg. xiii. pp. 164–183, 213–223, & 257–279.

Corrections of synonymy and descriptions of new species.

Butler, A. G. Heterocerous *Lepidoptera* collected in Chili by Thomas Edmonds. Tr. E. Soc. 1882, pp. 1–30, 101–108, 113–139, 339–427, pls. i. & xvi.

Includes 46 species of *Sphinges* and *Bombyces*, 45 *Noctuæ*, and 138 *Geometræ*.

Godman, F. Ducane, & Salvin, O. Biologia Centrali-Americana (*cf. Insecta*, General Subject). *Rhopalocera*, pp. 169–224, pls. xix.–xxiii.

Extends from *Agraulis* to *Eunica*.

Australasia.

Butler, A. G. On a small collection of *Lepidoptera* from the Hawaiian Islands. Tr. E. Soc. 1882, pp. 31–45.

19 species, some new. The paper includes notes by T. Blackburn.

Meyrick, E. Descriptions of Australian *Microlepidoptera*. vii. Revisional. P. Linn. Soc. N. S. W. vii. pp. 148–202.

Tepper, J. G. O. The *Papilionidæ* of South Australia. Tr. R. Soc. S. Austr. iv. pp. 25–36, pls. ii. & iii.

34 species of Butterflies, including *Synemon*, are noticed, and many of them figured. A few are described as new.

List of 82 *Lepidoptera* from Melbourne; Butler, Ann. N. H. (5) ix. pp. 84–103.

List of Butterflies taken near Balhannah Co., Adelaide; Guest, Tr. R. Soc. S. Austr. v. pp. 34–37.

Notes on *Sphinges* and *Bombyces* of S. Australia; Gaze, *op. cit.* iv. pp. 141–143.

Eggs or larvæ noticed of *Argyrophenga antipodum*, *Chrysophanus salustius*, *Nychthemera annulata*, *Porina variolaris*, *Ipana leptomera*, *Agrotis suffusa*, *Mecyna polygonalis*, *Boarmia attracta*, *Cidaria similata*, and *Helactia*, sp.; Purdie, N. Z. J. Sci. i. pp. 94 & 95.

Swarms of caterpillars in New Zealand; Sci. Goss. xviii. p. 141.

Papilionidæ.

Gosse, P. H. The prehensores of Male Butterflies of the genera *Ornithoptera* and *Papilio*. (Abstract.) P. R. Soc. xxxiii. pp. 23–27.

These organs consist of the following five parts:—1. The Valve. 2. The Harpe (an organ situated on the concave inner side of the valve, and frequently varying very much in structure, even in species which are apparently very closely allied). 3. The Uncus (a slender hooked spine, sometimes absent, terminating the dorsal arch of the eighth abdominal segment). 4. The Scaphium (a white boat-shaped mass, sometimes armed, projecting beneath the uncus; only met with in the *Papilionidæ* and *Pieridæ*, and sometimes absent even in them). 5. The Penis.

Hagen, H. A. On *Papilio machaon*, L., and its American representatives; *Papilio rutulus*, Boisd., and *Parnassius*; being a portion of a preliminary report on the Butterflies of Washington Territory. Papilio, ii. pp. 149–164.

According to the writer *Papilio oregonius* = *zolicaon*, var.; *P. sphyrus*, Hübn., = *machaon*, var. *asiatica*; *P. hospiton* is only an exaggerated var. of *machaon*; *P. aliaska* = *P. oregonius*; *P. hippocrates* = *machaon*, var.; nor can even *P. zolicaon* be regarded as distinct from *machaon*; *P. rutulus*, *turnus*, *dannus*, and probably *eurymedon*, are forms of one species; *Parnassius sminthcus*, var. described.

Ornithoptera rhadamanthus, Boisd., figs. 7, 7A & B, *Papilio palephates*, Westw., figs. 8, 8A–8C, p. 262, *antiphus*, Fabr., var. *kotzebuea*, Esch., figs. 3, 3A & B, *alphenor*, Cram., figs. 1, 1A & B, p. 264, *agamemnon*, Linn., figs. 4, 4A & B, p. 265, larvæ and pupæ described and figured; Dewitz, Verh. L.-C. Ak. xliv. pl. ix.

Papilio poccalirius, L., *machaon*, L., *Parnassius apollo*, L., var. *hesebolus*, Nordm., *corybas*, Fisch., var. n. *discobolus* (p. 349), *apollonius*, *actius*, and *delphius*, Eversm., noticed from Kulja; Alphéraky, Hor. Ent. Ross. xvi. pp. 347–357 & 433.

Papilio. Pryer (Tr. E. Soc. 1882, pp. 486 & 487) notices the following

Japanese species:—*P. xuthus* and *xuthulus*, *machaon*, *alcinous*, *macilentus*, *maacki*, and *demetrius*; he refers to their food plants, transformations and variation, and specially notices the difference in odour of the early spring and summer specimens of *P. alcinous*. *P. xuthus* and *xuthulus* he regards as broods, and considers *P. dehaani*, *bianor*, and *tutanus* to be forms of *maacki*.

Papilio. List of species captured in Angola from Sept.–Nov. 1880, by Von Mechow; Dewitz, B. E. Z. xxvi. p. 68. *P. albanus*, Feld., is hardly distinct from *eurymedon*, Boisd.; H. Edwards, Papilio, ii. p. 122. *P. antimachus* noticed; Aurivillius, Ent. Tidskr. iii. pp. 195 & 213. *P. govindra* mimics *Caduga tytia*; Hocking, Sci. Goss. xviii. p. 271. *P. læstrygonum* figured; Marshall & De Nicéville, Butt. Ind. i., front. figs. 1 & 1*a*. *P. machaon*: contributions to life-history; Buckler, Ent. M. M. xviii. pp. 244–249, Papilio, ii. pp. 85–90: aberrations; Marott, Giorn. Sc. Palerm. xiv. pp. 50 & 51, pl. iii. figs. 1–3. Local variation discussed, the American form is *P. aliaska*, Scudd.; W. H. Edwards, Papilio, ii. pp. 74–77: var. *asiatica*, Mén., noticed from Sikkim; Elwes, P. Z. S. 1882, p. 399. *P. oregonia*, Edw.: larva described; Stretch, Papilio, ii. pp. 119–121. *P. papone*, Westw., noticed from Upper Tenasserim; Marshall, J. A. S. B. li. pt. 2, p. 43. *P. peon*, Rog.: life history; Walker, Ent. M. M. xix. pp. 53–55. *P. polydamas*, Linn., *villiersi*, Boisd., and *sinon*, Cram. (= *zonaria*, Butl.): their claims to be considered as North American species discussed; W. H. Edwards, Canad. Ent. xiv. p. 120. *P. polydamas*: occurrence in Florida noticed; *id.* Papilio, ii. p. 122. *P. rutulus*, Boisd.: early stages of larva described; H. Edwards, *l. c.* pp. 112 & 113. *P. sinon*, Poda, and *podalirius*, Linn.: Hagen demonstrates the priority of the latter name; S. E. Z. xliii. p. 172. *P. thoas* (*cresphontes*) naturalized in Dutchess County, New York; Dwight, Psyche, iii. p. 327. *P. turnus* and *troilus*: scent-organ of larva described; Skinner, P. Ac. Philad. 1882, p. 239.

Zetides axion, Feld., redescribed; Moore, P. Z. S. 1882, p. 257.

Parnassius actius, Eversm., var. *rhodius* from Ladak (pl. ii. fig. 6), and *P. delius*, Esp., var. *corybas*, Fisch., noticed; Honrath, B. E. Z. xxvi. pp. 178 & 179. *P. apollo*: Hagen notices Meisner's account of an hermaphrodite, S. E. Z. xliii. p. 407; stridulation of ♀, Eaton, Ent. M. M. xix. p. 89; reputed occurrence in Devonshire (?) Brooke, Sci. Goss. xviii. p. 239. *P. clodius*, Mén.: distinctive characters pointed out; Butler, J. L. S. xvi. p. 472. *P. discobolus*, Staud., ♂, and ab. *nigricans*, from Thianshan, and var. *minor* from Ala Tau, noticed and figured; Staudinger, B. E. Z. xxvi. pp. 162 & 163, pl. i. figs. 1, 2, 2*a* & 3. *P. epaphus*, Oberth. (= *jacquemonti*, Gray, *nec* Boisd.), and var. *sikkimensis*, pl. xxv. figs. 4 & 5, *P. acco*, Gray (= *simo*, Gray), and *hardwickii*, Gray, discussed; Elwes, P. Z. S. 1882, pp. 399–401. *P. mnemosyne*, Linn., noticed; Spångberg, Ent. Tidskr. iii. p. 152. *P. smintheus*, Doubl., recorded from California; Behrens, Papilio, ii. p. 50. *P. thor*, H. Edw., = *eversmanni*, Mén., ♀ var.; H. Edwards, *l. c.* p. 148.

New genera and species:—

Byasa, Moore, P. Z. S. 1882, p. 258. Allied to *Papilio*; type, *P. phi-*

loxenus, Gray (larva described and figured by Hocking & Moore, *l. c.* pl. xii. figs. 5 & 5*a*).

Sarbaria, id. *ibid.* Allied to *Achillides*; type, *Papilio polyctor*, Boisd.; add *S. peeroza*, sp. n., *ibid.*, Dharmsala.

Sainia, id. *l. c.* p. 260. Allied to *Iliades*; type, *Papilio protenor*, Cram.

Cadvgoides, id. *ibid.* Allied to *Papilio*; type, *P. agestor*, Gray, add *C. gopala* (= *agestor*, Westw., *nec* Gray), sp. n., *ibid*, Kangra.

Papilio carpenteri, Butler, Ann. N. H. (5) x. p. 318, Japan; *P. tavoyanus*, id. *l. c.* p. 373, Tenasserim; *P. sikkimensis*, Sikkim Hills, and *nevilli*, Cachar, Wood-Mason, *op. cit.* (5) ix. pp. 103 & 105; *P. claræ*, Marshall, J. A. S. B. li. pt. 2, p. 42, pl. iv. fig. 5, Upper Tenasserim. *P. jutanus*, Fenton & Ishikawa, Papilio, ii. p. 36, Japan (outlines of this species and of *P. dehaani*, Feld., figured for comparison, figs. 13 & 14); *P. mechowi* and *hachii*, Dewitz, B. E. Z. xxvi. p. 69, pl. iii. figs. 1 & 2, Angola; *P. hahneli*, Staudinger, P. Z. S. 1882, p. 396, pl. xxiv. fig. 1, Rio Manés, Amazons.

Zetides seminigra, Butler, *l. c.* p. 153, New Britain.

Chapra prominens, Moore, P. Z. S. 1882, p. 261, N. W. Himalaya.

Sarangesa purendra, id. *l. c.* p. 262, Bombay, &c.

Parnassius honrathi, Staudinger, B. E. Z. xxvi. p. 161, pl. i. figs. 4, 5, & 5*a*. *P. staudingeri*, Haas, *l. c.* p. 163, pl. ii. figs. 7, 8, & 8*a*, both from Hazret Sultan Mountains, near Samarcand.

Pieridæ.

Alphéraky (Hor. Ent. Ross. xvi. pp. 357-375, 433 & 434) notices various *Pieridæ* from Kulja, especially *Pieris napi*, L., var. *bryoniæ*, Ochs., *P. callidice*, Esp., var. *chrysidice*, Herr.-Schäff., *Anthocharis belia*, Cram., *pyrothoe*, Eversm., *Colias hyale*, Linn., var. *sareptensis*, Staud. (a doubtful form, possibly a hybrid between *C. hyale* and *C. erate*, which are frequently found coupled); *C. erate*, Esp., abb. *pallida*, Staud., and *chrysodona*, Kind.; *C. thisoa*, Mén. (a perfectly distinct species), and *C. aurora*, Esp.

Elwes (P. Z. S. 1882, pp. 401 & 402) notices *Pieris brassicæ*, Linn., *ajaka*, Moore, *Delias belladonna*, Fabr., *Colias myrmidone*, Esp., and *Dercas wallichi*, Doubl., from Sikkim.

Pryer (Tr. E. Soc. 1882, pp. 487–490) refers to the variation, &c., of the following Japanese *Pieridæ*:—*Gonopteryx rhamni*, *Colias hyale*, *Pieris napi* (with which he regards *melete* as probably identical), *P. rapæ*, *Terias hecabe* (for which he proposes the new name *multiformis*, to include *hecabe*, *mandarina*, *hecabeoides*, *sinensis*, *mariesi*, *anemone*, *connexiva*, *hybrida*, *æsiope*, *breuda*, and *suri*), *Terias betheseba* and *læta*, and *Leucophasia vibilia* (? = *sinapis*). For *T. multiformis*, cf. also *id.* Ent. M. M. xix. p. 85.

Aporia crataegi: tenacity of life; Wurfbain, Tijdschr. Ent. xxv. p. xix.

A. soracta, Moore: larva noticed and figured; Hocking & Moore, P. Z. S. 1882, p. 256, pl. xi. fig. 5.

Pieris glauconome, Klug, taken by Trimen in Algeria; Oberthür, Bull. Soc. Ent. Fr. (6) ii. p. lxxvi. *P. protodice* and larva popularly described and figured; W. Saunders, Canad. Ent. xiv. pp. 1 & 2, figs. 1–3. *P. protodice* and *rapæ* noticed; Claypole, Rep. E. Soc. Ont. 1881, p. 33, and Canad. Ent. xiv. p. 18. *P. melete*, Mén. (? = *napi*, var.), and *rapæ*, var. *mandschurica* from Amur discussed; Speyer, S. E. Z. xliii. pp. 375–379. *P. menapia*, Feld.: life-history, it is very destructive to the yellow pine: var. *suffusa* described and figured; Stretch, Papilio, ii. pp. 103–110, pl. ii. *P. marsupia* [? *menapia*], ravages in Washington Territory; the larva suspends itself by a thread; Hagen, Canad. Ent. xiv. pp. 177 & 178. *P. rapæ*: notes on its occurrence in America, parasites, &c.; Murtfeldt, Tr. Ac. St. Louis, iv. pp. li.–liv.: first appearance in Nebraska; Dodge, Canad. Ent. xiv. pp. 39 & 40. *P. rapæ* and *protodice*: hybrid larvæ living till the second moult; Hoy, *tom. cit.* pp. 99 & 100. *P. rapæ*, figs. 4–9, and *daplidice* (dwarf, fig. 10): varieties noticed, including ab. *todaroana* of *rapæ*; Marott, Giorn. Sc. Palerm. xiv. pp. 51 & 52, pl. iii. *P.* (*Thyca*) *harpalyce* and *aganippe*, Don.: transformations described and figured; McCoy, Prodr. Zool. Vict., Dec. i. pls. ix. & x. [1878].

Callidryas, Boisd. W. H. Edwards discusses the N. American species and concludes that the only species found north of Mexico are *eubule*, *sennex*, and *philea*, L., and *agarithe*, Boisd.; Tr. Am. E. Soc. ix. pp. 9–14. *C. drya*, Boisd.: life-history; Mathew, Ent. M. M. xviii. pp. 219 & 220.

Dryas leda, Wallengr. Generic characters contrasted with those of *Eronia*; Snellen, Tijdschr. Ent. xxv. p. 230.

Colias thisoa, Mén., ♂, ♀, *libanotica*, Led., ♂, *myrmidone*, Esp., ♂, and *aurora*, Esp., ♀, figured; Romanoff, Hor. Ent. Ross. xvii. pl. v. figs. 1–5. *C. thisoa*, Mén., is structurally distinct from *myrmidone*; Staudinger, B. E. Z. xxvi. pp. 167 & 168, note. *C. sareptensis* and *pallida*, Staud., and *erate*, Esp., differentiated; Butler, Ann. N. H. (5) ix. pp. 208 & 209. *C. erate*, var. *beckeri*, from Sarepta, and *C. aurora*, var. *anna* from the Caucasus, described; Gerhard, B. E. Z. xxvi. p. 125. *C. erate*, Esp. (?) ♂ from N. W. Himalaya described; Moore, P. Z. S. 1882, p. 255. *C. christina*, Edw., is a good species, but *C. barbara* and *harfordi*, H. Edwards, are identical; W. H. Edwards, Canad. Ent. xiv. p. 29. *C. philodice* noticed as injurious to clover; Saunders, Rep. E. Soc. Ont. 1881, pp. 47 & 48, figs. 20 & 21: unusual abundance; H. Edwards, Papilio, ii. p. 34. *C. simoda*, De l'Orza, noticed; Butler, *l. c.* p. 18.

Zerene kyale, Linn. Occurrence in Sweden; Sandahl, Ent. Tidskr. iii. p. 12.

Rhodocera cleopatra, var. *italica*, from South Europe, described; Gerhard, *l. c.* p. 125.

Gonopteryx leachiana, Gult. Dwarf specimen from Upper Amazons; H. Edwards, *l. c.* p. 34.

Teracolus ocale, Boisd. (♀), *arethusa*, Dru., *antigone* (♀), and *phlegetonia*, Boisd. (♀ described), noticed from Accra; Butler, Ent. M. M. xviii. pp. 227–230.

New species:—

Leucophasia morsii, Fenton and Ishikawa, Papilio, ii. p. 35, figs. 3 & 4, S. Hokkaido, Japan (*L. amurensis*, Mén., figured for comparison, figs. 1 & 2; outlines of both species, figs. 5–8).

Terias excavata, *purrecа*, p. 252, *irregularis*, fig. 3, and *apicalis*, fig. 2, p. 253, Moore, P. Z. S. 1882, pl. xii., Kangra; *T. hapale*, Mabille, Le Nat. ii. p. 99, Madagascar.

Elodina primularis, Butler, Ann. N. H. (5) x. p. 152, Duke of York Island.

Aporia belucha, Marshall, P. Z. S. 1882, p. 760, Beluchistan.

Synchloe butleri (Hocking, MS.), Moore, *l. c.* p. 256, pl. xi. figs. 6 & 6*a*, Lahoul.

Ganoris dulcinea, Butler, *l. c.* (5) ix. p. 18, Corea.

Delias salvini, id. *l. c.* (5) x. p. 152, New Britain.

Belenois picata, id. *l. c.* p. 153, New Britain.

Appias delicata, id. *ibid.*, New Britain.

Ixias pygmæa, Moore, *l. c.* p. 254, pl. xii. fig. 1, Kangra.

Colias erschoffi, figs. 1 & 2, and *staudingeri*, figs. 3 & 4, Alphéraky, Hor. Ent. Ross. xvi. pp. 362 & 368, pl. xiv., Kulja; *C. olga*, Romanoff, Hor. Ent. Ross. xvii. pp. 127–134, pl. iv., Caucasus; *C. alpherakii*, *wiskotti* (pl ii. figs. 9 & 10), and var. *leuca*, Staudinger, B. E. Z. xxvi. pp. 164 & 166, Alai Mountains, Samarcand, &c.; *C. lativitta*, Moore, *l. c.* p. 255, Nepal, Cashmere, &c.

Teracolus carteri, p. 227, *coniger*, and *minans*, p. 229, Butler, Ent. M. M. xviii., Gold Coast.

Anthocharis rosa, W. H. Edwards, Papilio, ii. p. 45, Texas; *A. siga*, Mabille, Le Nat. ii. p. 100, Madagascar.

Danaidæ.

Distant (Rhop. Mal. pp. 3 & 4) uses the name *Danaina* for all the Old World *Danainæ*, and two tropical American genera (? *Lycorea* and *Tithorea*), and redescribes and figures the following known species:—*Hestia lynceus*, Dru., fig. 2, p. 6, *linteata*, Butl., fig. 1, p. 7, *Ideopsis daos*, Boisd., figs. 3 & 4, p. 8, *Radena vulgaris*, fig. 8, p. 10, *Danais aspasia*, var. *crocea*, Fabr, fig. 7, p. 13, *melaneus*, Cram., fig. 6, p. 14, *agleoides*, Feld., fig. 5, p. 15, *septentrionis*, Butl., fig. 9, pl. i. p. 16, *genutia*, Cram., figs. 2 & 3, p. 18, *melanippus*, var. *hegesippus*, fig. 1, pl. ii. p. 19, *chrysippus*, L., pl. i. fig. 10, *Euploea malayica*, Butl., fig. 7, p. 22, *bremeri*, Feld., fig. 4, *castelnaui*, Feld., fig. 6, *midamus*, L., figs. 8 & 9, pl. ii. p. 24, *mulciber*, Cram., pl. iii. figs. 1 & 2, p. 25, *ledereri*, Feld., pl. ii. fig. 10, *vestigiata*, Butl., pl. iii. figs. 6 & 7, p. 26, *diocletianus*, Fabr., pl. iv. figs. 4 & 5, p. 28, *crassa*, Butl, pl. v. fig. 8, p. 29, *chloe*, Guér., pl. ii. fig. 5, pl. iv. fig. 2, p. 30, *margarita*, Butl., pl. iv. fig. 3, p. 31, *distanti*, Moore, pl. v. fig. 9, p. 32, *godarti*, fig. 8, *menetriesi*, Feld., figs. 4 & 5, p. 34, *pinwilli*, Butl., figs. 9 & 10, p. 35, and *grotii*, Feld., fig. 3, pl. iii. p. 36.

Marshall & De Nicéville (Butt. Ind. i.) describe the *Danainæ* of India, Burma, and Ceylon, and figure the following species:—*Hestia jasonia*,

Westw., pl. iii. fig. 1, *cadelli*, Wood-Mason & De Nicév., fig. 2, and *hadeni*, W.-M. & N., fig. 3, pl. iv., *Ideopsis daos*, Boisd., pl. iv. fig. 4, *Danais vulgaris*, Butl., p. 32, *nicobarica*, W.-M. & N., p. 34, *crocea*, Butl., pl. v. fig. 5, *aglea*, Cram., pl. vi. fig. 7, *melaneus*, Cram., pl. v. fig. 5, *nilgiriensis*, Moore, fig. 9, *septentrionis*, Butl., fig. 8, *chrysippus*, Linn., fig. 10, pl. vi. *genutia*, Cram., p. 7, *Euploea sinhala*, Moore, fig. 12, *rhadamanthus*, Fabr., fig. 11, pl. vii., *elisa*, Butl., pl. viii. fig. 14, *mazares*, Moore, p. 74, *midamus*, Linn., fig. 13, *crameri*, Luc., fig. 15, pl. viii., *core*, Cram., fig. 16, *alcathoe*, Godt., fig. 17, and *hopii*, Feld., fig. 18, pl. ix.

Short notes on 10 species of Indian *Danainæ*; Marshall, P. A. S. B. 1882, pp. 142 & 143.

Danainæ in collections are not liable to the attacks of mites; J. J. Weir, Ent. xv. pp. 160 & 161.

Euploea. Butler & Distant discuss the question of priority between Butler's & Felder's names; Ann. N. H. (5) x. pp. 75–77, 178, 179, & 263. *E. unibrunnea*, Godman & Salvin, noticed by them from New Ireland; P. Z. S. 1882, p. 754.

Danais juventa, Cram. Larva and pupa described and figured; Dewitz, Verh. L.-C. Ak. xliv. p. 259, pl. ix. figs. 6, 6A, B.

Radena similis, var. *nicobarica*, Wood-Mason & De Nicéville, noticed and figured by them; J. A. S. B. li. pt. 2, p. 14, woodcuts.

Caduga tytia, Gray, mimicked by *Papilio govindra*, Moore; Hocking, Sci. Goss. xviii. p. 271.

Xanthocleis psidii, Linn., discussed and figured; Aurivillius, Sv. Ak. Handl. xix. 5, p. 45, pl. i. fig. 1.

New species :—

Danais adustus, Godman & Salvin, P. Z. S. 1882, p. 755, New Ireland; *D. claribella*, Fiji, and *sobrinoides*, New Britain, Butler, Ann. N. H. (5) x. pp. 36 & 37.

Salatura decipiens, Solomon Islands, and *biseriata*, Duke of York Island, *id. l. c.* p. 37.

Salpinx biformis, Duke of York Island, p. 37, *ænea*, Solomon Islands, *viridis*, Thursday Island, p. 38, *perdita*, Duke of York Island and New Britain, p. 39, *id. l. c.*

Crastia distanti, Moore, Ann. N. H. (5) ix. p. 453, Sumatra; *C. honesta*, Solomon Islands, and *cerberus*, New Britain and New Ireland, Butler, *l. c.* pp. 39 & 40.

Euploea illudens, p. 40, *decipiens*, Duke of York Island, &c., and *fraudulenta*, Solomon Islands, p. 41, *id.* l. c.; *E. dejeani* (Moore, MS.), Distant, Rhop. Mal. p. 29, pl. iv. fig. 1, Malana, Sumatra (? = *chloe*, var.); *E. simulatrix*, Wood-Mason & De Nicéville, J. A. S. B. li. pt. 2, p. 15, pl. iii. figs. 1 & 2, Great Nicobar.

Isamia rothneyi, Moore, Ent. M. M. xix. p. 34, Barrackpore.

Acræidæ.

Pareba vesta, Fabr. Transformations described; Graham Young, P. Z. S. 1882, p. 243.

HELICONIIDÆ.

Heliconia charitonea, Linn. Habits described, and transformations described and figured; Edwards, Butt. N. Am., ser. ii. pl. x. *Heliconia*, pl. i. (*cf.* also *id.* Am. Nat. xvi. p. 122; P. Am. Ass. xxx. p. 279).

Heliconius venus and *godmani*, spp. nn., Staudinger, P. Z. S. 1882, pp. 396 & 397, pl. xxiv. figs. 2 & 3, Colombia.

NYMPHALIDÆ.

REICHENAU, W. VON. Die Züchtung des Nesselfalters (*Vanessa urticæ*, L.), ein Beweis für den directen Einfluss des Klimas. Kosmos, xii. pp. 46–49, woodcut.

The author traces the gradual course of modification from *polaris*, Staud., to *ichnusa*, Bon.

Alphéraky (Hor. Ent. Ross. xvi. pp. 397–412, 434 & 435) notices the *Nymphalidæ* of Kulja, especially *Melitæa aurinia*, Rott., var. *asiatica* (Staud., MS.), *phœbe*, Knoch, var. *sibina*, pl. xiv. fig. 13, *didyma*, var. *ala* (Staud., MS.), *Argynnis pales*, W. V., var., *græca*, Staud., and *A. niobe*, Linn., var. *orientalis*, *adippe*, Linn., var. *tianschanica*, and *paphia*, Linn., var.

Elwes (P. Z. S. 1882, pp. 403 & 404) notices the following species from Sikkim: — *Vanessa ladakensis*, Moore, *kashmeriensis*, Koll., *c-album*, Linn., *Argynnis gemmata*, Butl., pl. xiv. figs. 6 & 7, and *lathonia*, Linn.

The following known species of *Nymphalidæ* are figured by Godman & Salvin (Biol. Centr. Am. *Rhop.*):—*Clothilda insignis*, figs. 4 & 5, *Synchloe lacinia*, Geyer, figs. 6–17, pl. xix., *melanarge*, Bates, figs. 9 & 10, *erodyle*, Bates, figs. 3 & 4, *pœcile*, Feld., figs. 1 & 2, *gaudialis*, Bates, figs. 5 & 6, *bonplandi*, Latr. (figured as *narva*, Fabr.), figs. 7 & 8, *Eresia mechanitis*, G. & S., figs. 13 & 14, *drypetis*, G. & S., figs. 11 & 12, *nigripennis*, Salv., figs. 15 & 16, pl. xx., *eutropia*, Hew. (figured as *dismorphina*, pl. xx. figs. 17 & 18, pl. xxi. fig. 1, *cœla*, Druce, pl. xxi. figs. 2 & 3, *pœcilina*, Bates, figs. 19 & 20, *clara*, Bates, figs. 21 & 22, pl. xx., *cyneas*, G. & S., figs. 10 & 11, *picta*, Edw., figs. 4 & 5, *thebais*, G. & S., figs. 13–15, *boucardi*, G. & S., figs. 16 & 17, *pallescens*, Feld., figs. 18 & 19, *elada*, Hew., figs. 6 & 7, *imitata*, Streck., figs. 8 & 9, *anieta*, Hew., fig. 20, *fragilis*, Bates, fig. 23, *nigrella*, Bates, figs. 24–26, *niveonotis*, Butl. & Druce, fig. 27, *poltia*, G. & S., figs. 28 & 29, *ptolyca*, Bates, figs. 32–36, pl. xxi., *tulcis*, Bates, figs. 1 & 2, *frisia*, Pocy, fig. 6, *ardys*, Hew., figs. 3–5, *subota*, G. & S., figs. 7 & 8, *drymæa*, G. & S., figs. 9 & 10, *sosis*, G. & S., figs. 11 & 12, *nebulosa*, G. & S., figs. 13 & 14, *fulgora*, G. & S., figs. 15 & 16, *crithona*, Salv., figs. 17 & 18, *atronia*, Bates, figs. 19–21, *cassiopea*, G. & S., figs. 22 & 23, *diallus*, G. & S., figs. 24 & 25, *fulciplaga*, Butl., figs. 26 & 27, and *olanes*, Hew., figs. 28 & 22, *sopolis*, G. & S., figs. 30–32, pl. xxii.; *Microtia elva*, Bates, pl. xx. fig. 23, *Eurema arcai*, Salv., figs. 1 & 2, *Eunica mira*, G. & S., figs. 10 & 11, and *alcmena*, Doubl., figs. 6 & 7, pl. xxiii. Several other species of *Eunica* are figured on pl. xxiii. in advance of the text; viz., *E. augusta*, Bates, figs. 3–5, *pomona*, Feld., figs. 8 & 9,

excelsa, G. & S., figs. 12 & 13, *carula*, G. & S., fig. 14, and *modesta*, Bates, figs. 15 & 16.

Limenitis sibylla; *Vanessa c-aureum* and *pryeri* (probably identical), and *V. c-album*, *fentoni*, and *hamigera* (all three probably identical), noticed; Pryer, Tr. E. Soc. 1882, p. 490.

Colænis delila, Fabr. Larva described and figured; Dewitz, Verh. L.-C. Ak. xliv. pp. 248 & 249, pl. viii. figs. 6 & 6A.

Cethosia biblis, Dru., var. *curymena*, Feld. Larva and pupa described and figured; *id. l. c.* pp. 260 & 261, pl. ix. figs. 5, 5A, B.

Cirrhochroa nicobarica, Wood-Mason & De Nicéville, figured by them; J. A. S. B. li. pt. 2, pl. iii. fig. 5.

Argynnis cytheris, Dru., and *dexamene*, Boisd. Berg (An. Soc. Arg. xiii. pp. 154 & 155) gives the following synonymy:—*A. cytheris*, Dru. (*siga*, Hübn., *anna*, Blanch., *lathonioides*, Blanch., description only; *anna* and *lathonioides*, Reed), *A. dexamene*, Boisd. (*cytheris*, Blanch., Reed; *lathonioides*, Blanch., figs. only, Berg; *montana*, Reed). *A. adippe* and *paphia*: aberrations described and figured; Jenner Weir, Ent. xv. pp. 49–51, & 142, pl. i., and woodcuts. *A. adippe*, Linn., var. *cleodoxa*, Ochs., taken in England; Bright, Ent. xv. p. 129. *A. behrensi*, Edw., perhaps = *A. eyleis*, Boisd.; Butler, J. L. S. xvi. p. 465. *A. daphne*, var. *fumida*, from Corea and Yesso described; *id.* Ann. N. H. (5) ix. p. 16. *A. idalia*: habits; Skinner, Canad. Ent. xiv. p. 20. *A. liliana*, H. Edw., and var. *baroni* discussed; W. H. Edwards, Tr. Am. Ent. Soc. ix. p. 2. *A. myrina*: habits and length of life; *id.* Am. Nat. xvi. pp. 122 & 123. *A. paphia*, Linn.: variety noticed; Barrett, Ent. M. M. xviii. pp. 188 & 189. *A. rabdia*, Butl.: variation noticed; Ishikawa, Papilio, ii. p. 36, figs. 9–12.

Melitæa phœbe, var. *parva*, and *M. athalia*, var. *mehadiensis*, from Hungary described; Gerhard, B. E. Z. xxvi. p. 126. *M. aurinia*, var. (?) *orientalis*, Herr.-Schäff., noticed; Staudinger, Hor. Ent. Ross. xvi. p. 67. *M. arachne* and *minuta*, W. H. Edwards, differentiated by him; *l. c.* p. 8. *M. sterope*, Edw.? noticed from California; Butler, J. L. S. xvi. p. 466.

Symbrenthia hyppoclus, Cram. Larva and pupa figured; Hocking & Moore, P. Z. S. 1882, pl. xi. figs. 4 & 4*a*.

Grapta comma, Harr., and *interrogationis*, Fabr. Transformations described; W. H. Edwards, Canad. Ent. xiv. pp. 189–194 & 201–207.

Vanessa io. Variation; Bieger, Ent. Nachr. viii. pp. 275 & 276: occurrence in Japan; Lucas, Bull. Soc. Ent. Fr. (6) ii. pp. lxxxix. & xc. *V. lunigera*, Butl., figured; Waterhouse, Aid, ii. pl. cvi. *V. tammeamea*, Esch.: larva described; Blackburn, Ent. M. M. xix. pp. 55 & 56. *V. urticæ* ab. *gructi* from Switzerland, described; Corselle, Feuill. Nat. ii. p. 99.

Pyrameis atalanta: transformations described; W. H. Edwards, *l. c.* pp. 229–234. *P. cardui*: *Ichneumon rufiventris*, Brullé, is a parasite upon it; Heustis, Rep. E. Soc. Ont. 1881, p. 29. *P. virginiensis*, Dru.: synonymy noticed; Berg, *l. c.* p. 166.

Junonia orithya, Linn., and varieties discussed; Aurivillius, Sv. Ak. Handl. xix. 5, pp. 82–85.

Callima huegeli. Mimicry noticed; Hocking, Sci. Goss. xviii. p. 271.

Gynæria dirce, Linn. Dwarf specimen from Upper Amazon; H. Edwards, Papilio, ii. p. 34.

Euripus consimilis, Westw., noticed; Butler, Ann. N. H. (5) ix. pp. 405 & 406.

Limenitis lepechini, Ersch., = *trivena*, Moore, = *ligyes*, Hew.; Hedemann, Hor. Ent. Ross. xvi. p. 259 [err. 247], note. *L. artemis* and *disippus*: supposed hybrid from Canada; W. H. Edwards, Papilio, ii. p. 47. *L. ursula*: in the late autumn brood the eggs are immature; *id.* Canad. Ent. xiv. p. 29.

Athyma kasa, Moore: larva and pupa described and figured; Dewitz, *l. c.* pp. 261 & 262, pl. ix. figs. 2, 2A, & B. *A. opalina*, Koll.: larva described and figured; Hocking & Moore, *l. c.* p. 241, pl. xi. fig. 3.

Apatura iris: note on its development after emerging from the pupa; Anderson, Ent. xv. p. 188. *A. herse* and *lycaon*, Fabr.: uncertainty of identification; W. H. Edwards, *l. c.* p. 28.

Agrias beatifica, Hew., ♀ described and figured; Godman & Salvin, P. Z. S. 1882, pl. xix. figs. 3 & 4.

Charaxes jasius, Linn. Young larva noticed; Von Nolcken, S. E. Z. xlii. p. 174.

Pseudoneptis, g. n., Snellen, Tijdschr. Ent. xxv. p. 221. Allied to *Læra* (*Catuna*); cells of all the wings closed. Type, *Papilio cœnobita*, Fabr.

New species:—

Cynthia cantori, Distant, Ann. N. H. (5) x. p. 406, Malay Peninsula.

Argynnis hegemone (Staudinger, MS.), Alphéraky, Hor. Ent. Ross. xvi. p. 407, pl. xv. figs. 16 & 17, Kulja; *A. coreana*, Butler, Ann. N. H. (5) ix. p. 15, Corea and Japan; *A. baralacha*, Moore, P. Z. S. 1882, p. 242, pl. xi. figs. 1 & 1*a*, Ladak; *A. altissima*, Elwes, *tom. cit.* p. 403, pl. xxv. fig. 8, Sikkim; *A. artonis*, W. H. Edwards, Tr. Am. Ent. Soc. ix. p. 1, Colorado.

Brenthis perrii, Butler, *l. c.* p. 16, Corea.

Melitæa fergana (Staudinger, MS.), Fergana, Persia, and *solona*, pl. xiv. figs. 14 & 15, Tian-Chian, Alphéraky, *l. c.* p. 404; *M. fergana* and varr. *maracandica* and *hyrcana*, Staudinger, B. E. Z. xxvi. p. 168, Alai & Hazret Sultan Mountains and Shahkuh; *M. perse*, W. H. Edwards, Papilio, ii. p. 136, Arizona.

Phyciodes cynisca, fig. 12, Mexico, p. 191, *cluvia*, figs. 21 & 22, p. 198, *lutescens*, p. 199, *sitalces*, figs. 30 & 31, pl. xxi., Guatemala, p. 201, *argentea*, Guatemala, Nicaragua, p. 207, Godman & Salvin, Biol. Centr. Am. *Rhop.* i.

Neptis ampliata, p. 42, *eblis*, New Britain, and *fissizonata*, Solomon Islands, p. 43, Butler, *l. c.* (5) x.; *N. amboides*, Moore, *l. c.* p. 241, Cashmere and Kangra; *N. sextilla*, Mabille, Le Nat. ii. p. 99, Madagascar.

Limenitis hulsti, W. H. Edwards, *l. c.* p. 46, Utah.

Charaxes kahldeni, figs. 1 & 2, p. 381, *homeyeri*, fig. 3, and *ehmckii*, fig. 4, p. 382, Homeyer & Dewitz, B. E. Z. xxvi. pl. vii., Pungo N'dongo, Angola.

Eulepis hamasta, Moore, P. Z. S. 1882, p. 238, Dharmsala.

Agrias stuarti, Godman & Salvin, P. Z. S. 1882, p. 338, pl. xix. figs. 1 & 2, Yquitos, Amazons.

Prothoe layardi, Godman & Salvin, P. Z. S. 1882, p. 754, New Ireland.

Morphidæ.

Distant (Rhop. Mal. p. 67) treats *Morpho* and allies as a group of *Nymphalinæ*, under the name of *Morphina*; "palpi slender, the anterior margins not dilated; larva with a more or less bifid tail." The typical group *Nymphalina* has the "palpi broad, the anterior margin more or less dilated; larva variable in form" (p. 83). The following known species of *Morphina* are redescribed and figured:—*Amathusia phidippus*, L., pl. vi. figs. 6 & 7, p. 70, *Zeuxidia amethystus*, Butl., figs. 1 & 2, p. 72, *Discophora tullia*, Cram., figs. 8 & 9, pl. vii. p. 74, *celinde*, Stoll, pl. v. figs. 10 & 11, p. 75, *Thaumantis lucipor*, Westw., pl. ix. figs. 8 & 9, p. 77, *noureddin*, Westw., pls. vii. fig. 3, ix. fig. 7, p. 78, *pseudaliris*, Butl., fig. 3, p. 79, *Clerome gracilis*, Butl., fig. 1, *faunula*, Westw., fig. 2, pl. viii. p. 81, and *Xanthotænia busiris*, Westw., p. 82, pl. v. fig. 7.

Zeuxidia masoni, Moore, redescribed, and *Thaumantis louisa* Wood-Mason, ♀ described; Marshall, J. A. S. B. li. pt. 2, pp. 39–41.

Æmona amathusia, Hew., figs. 2 & 2*a*, and *pealii*, Wood-Mason, figs. 3 & 3*a*, figured; Marshall & De Nicéville, Butt. Ind. i., front.

Brassolidæ.

Opsiphanes, Westw. Revised list of species; Aurivillius, Sv. Ak. Handl. xix. (5) pp. 75 & 76.

Satyridæ.

Alphéraky (Hor. Ent. Ross. xvi. pp. 413–430 & 435) notices the *Satyridæ* of Kulja, especially *Erebia turanica*, Ersch., pl. xv. fig. 22, *Satyrus anthe*, Ochs., var. *enervata*, and ab. *analoga*, *Epinephele dysdora*, Led., var., *lycaon*, Rott., var. *naubidensis*, Ersch., and *Cœnonympha iphis*, W. V., var. *mahometana*.

Elwes (P. Z. S. 1882, pp. 404–406) notices the following species from Sikkim:—*Chionobas pumilus*, Feld., pl. xxv. fig. 3, *Zophoessa atkinsonia*, Hew., *Satyrus padma*, Koll., *Mycalesis visala*, Moore, *Hyphthima sakra*, Moore, and *H.*, sp. n. (?).

Distant (Rhop. Mal.) figures and redescribes the following known species:—*Melanitis leda*, L., fig. 10, p. 41, *ismene*, Cram., figs. 9, 11 & 12, pl. iv. p. 42, *Lethe europa*, Fabr., pl. v. figs. 5 & 6, p. 43, *Calites euptychioides*, var. *humilis*, fig. 15 (woodcut), p. 45, *angularis*, Moore, pl. v. fig. 3, p. 46, *Mycalesis maianeas*, Hew., pl. vii. fig. 4, p. 48, *orseis*, Hew., pl. v. fig. 4, *medus*, Fabr., fig. 8, p. 49, *mineus*, L., figs. 7, 13 & 14, pl. iv. p. 50, *blasius*, Fabr., pl. vii. fig. 7, p. 52, *fusca*, Feld., fig. 1, p. 53, *janardana*, Moore, fig. 2, pl. v. p. 54, *Hyphthima corticaria*, Butl., fig. 8, p. 55, *methora*, Hew., fig. 9, pl. vi. p. 56, *newboldi*, Dist., pl. iv. fig. 6, *huebneri*, Kirb., pl. vii. fig. 5, p. 57, *Elymnias discrepans*, Dist.,

pl. vi. figs. 2 & 3, p. 60, *nigrescens*, Butl., pls. vi. fig. 1, ix. fig. 1, p. 61, *lutescens*, Butl., pl. vi. figs. 4 & 5, *lais*, Cram., pl. ix. fig. 2, p. 62, *penanga*, Westw., pls. vi. fig. 11, vii. fig. 6, p. 63, and *casiphone*, Hübn., pl. vi. fig. 10, p. 64.

Amecera menava, *Hipparchia pimpla*, *H. anthe*, var., and *Aulocera brahminus* (which is distinct from *A. veeranga*) noticed; Marshall, P. Z. S. 1882, p. 758.

Lethe sicelis and *diana* (probably temperature forms), *Neope goschkevitschi*, and *Hyphthima baldus* noticed; Pryer, Tr. E. Soc. 1882, p. 490.

Elymnias minus, Wood-Mason & De Nicéville, figured by them, J. A. S. B. li. pt. 2, pl. iii. figs. 3 & 4. *E. undularis*, Dru., mimicry; Hocking, Sci. Goss. xviii. p. 271.

Debis portlandia, Fabr.: transformations described; W. H. Edwards, Canad. Ent. xiv. pp. 84–88.

Melanitis ismene (*bela*): habits and mimicry; Hocking, *l. c.* p. 271.

Neonympha areolatus, Smith & Abb.: transformations described; W. H. Edwards, *l. c.* pp. 163–166. *N. henshawi*, W. H. Edwards, noticed by him, Tr. Am. Ent. Soc. ix. p. 7.

Erebia. Pyrenean species noticed; Oberthür, Bull. Soc. Ent. Fr. (6) ii. pp. clii. & cliii. *E. eriphyle*, Freyer, and *pyrrha*, Fabr. (*manto*, Esp., nec Fabr.), var. *rogesiaca* discussed; Christ, MT. schw. ent. Ges. vi. pp. 231–243. *E. scoparia*, Butler, figured; Waterhouse, Aid, ii. pl. cv.

Chionobas calais, Scudd., much resembles *tarpeia*, Esp., and is quite distinct from *chryxus* or *varuna*; W. H. Edwards, Canad. Ent. xiv. p. 29. *C. tarpeia* noticed; *id. l. c.* p. 120.

Œneis semidea: geological history of its present distribution discussed; Grote, Illustrated Essay, pp. 81–85.

Arge galathea, Linn., var. approaching *leucomelas*, Esp., and *pherusa*, Boisd., second brood and aberration noticed; Marott, Giorn. Sc. Palerm. xiv. pp. 53 & 54, pl. iii. figs. 11 & 12.

Melanargia halimede, Mén., noticed from Corea; Butler, Ann. N. H (5) ix. p. 15. *M. pherusa*, Boisd., monstrosity described; Failla-Tedaldi, Nat. Sicil. i. p. 208, pl. xi. fig. 8.

Satyrus pelopea, Klug, *alpina*, Staud., *mamurra*, Herr.-Schäff., *heroe*, Freyer, and their varieties discussed; Staudinger, Hor. Ent. Ross. xvi. pp. 67–71. *S. pelopea* var. *kirgisa*, from the Caucasus described; Gerhard, B. E. Z. xxvi. p. 127. *S. alope*, Fabr., transformations figured and described; W. H. Edwards, Butt. N. Am., ser. 2, *Satyrus*, pls. ii. & iii.; he includes under the form *alope* (pl. ii.), varr. *texana* and *maritima*, Edw., and under the form *nephele*, Kirby (pl. iii.), varr. *olympus*, Edw., and *boopis*, Behr.; he considers the species to have originated in the southern form *pegala*, Fabr. Additional notes on times of appearance of larva and imago; *id.* Canad. Ent. xiv. p. 28. *S. ariane*, Boisd., variation noticed; Butler, J. L. S. xvi. pp. 464 & 465.

Epinephile janira var. *hispulla* noticed and figured; Marott, *l. c.* p. 54, pl. iii. fig. 13.

Cœnonympha davus [evidently in error for *pamphilus*], variation noticed; J. J. Weir, Ent. xv. p. 190.

New species :—

Elymnias saueeri, Distant, Rhop. Mal. p. 65, pl. ix. fig. 3, Malay Peninsula ; *E. discrepans*, id. Ann. N. H. (5) ix. p. 397, Penang, Province Wellesley.

Dyclio holofernes, Butler, Ann. N. H. (5) x. p. 42, Duke of York Island.

Zophoessa dura, Marshall, J. A. S. B. li. pt. 2, p. 38, pl. iv. fig. 2, Upper Tenasserim.

Lethe (?) *margaritæ*, Elwes, P. Z. S. 1882, p. 405, pl. xxv. fig. 1, Sikkim.

Debis flavalba, Marshall, P. Z. S. 1882, p. 759, Kunawar ; *D.* (*Tansima*) *masoni*, Elwes, *l. c.* p. 405, pl. xxv. fig. 2, Sikkim.

Melanitis libya, Distant, *l. c.* (5) x. p. 405, Masassi, East Africa.

Erebia jordana and *hades*, Staudinger, B. E. Z. xxvi. pp. 171 & 172, Central Alai Mountains ; *E. kalmuka*, figs. 18 & 19, and *sibo*, figs. 20 & 21, Alphéraky, Hor. Ent. Ross. xvi. pp. 414 & 416, pl. xv., Kulja.

Callerebia intermedia, Kangra, and *cashapa*, Dharmsala, Masuri, Simla, Moore, P. Z. S. 1882, p. 236.

Chionobas varuna, W. H. Edwards, Canad. Ent. xiv. p. 2, Dacota.

Melanargia parce, Staudinger (? = *iapygia*, var.), B. E. Z. xxvi. p. 170, Margelan, Samarcand, &c.

Lasiommata ocrea, Guest, Tr. R. Soc. S. Austr. v. p. 35, Adelaide.

Epinephele kirghisa, Alphéraky, *l. c.* p. 423, pl. xv. figs. 24 & 25, Kulja.

Hipparchia shandura, pl. iv. fig. 3, and *digna*, Marshall, J. A. S. B. li. pt. 2, pp. 38 & 67, Cashmere.

Satyrus ocellatus, Butler, Ann. N. H. (5) ix. p. 14, Corea ; *S. staudingeri*, Haas, B. E. Z. xxvi. p. 172, Penjikend, near Samarcand ; *S. josephi* [cf. also Alphéraky, *l. c.* p. 421], Fergana, and *stulta*, Samarcand, Staudinger, *l. c.* pp. 174 & 175 ; *S. regeli* (Ersch., MS.), Alphéraky, *l. c.* p. 419, pl. xv. fig. 23, Kulja ; *S. olga*, Gerhard, B. E. Z. xxvi. p. 127, Caucasus ; *S. thione* (Boisd., MS.), (= *montrolii*, Berg, Burm., *nec* Feisth., = *lefebvrei*, Burm., *nec* Guér.), Berg, An. Soc. Arg. xiii. p. 166, Buenos Aires, Uruguay, Patagonia.

Mycalesis surkha, Marshall, *l. c.* p. 37, pl. iv. fig. 1, Upper Tenasserim.

Loesa fervida, Butler, *l. c.* (5) x. p. 372, Tenasserim.

Calysisme subfasciata, Moore, P. Z. S. 1882, p. 237, pl. xii. fig. 8, Dharmsala.

Hyphthima indecora, id. *l. c.* pl. xii. fig. 7, Kangra ; *H. marshalli*, Butler, *l. c.* p. 373, Tenasserim ; *H. newboldi*, Distant, *l. c.* (5) ix. p. 396, Province Wellesley ; *H. robinsoni*, id. *l. c.* (5) x. p. 406, S. India ; *H. bolanica*, Marshall, P. Z. S. 1882, p. 759, Bolan Pass.

Cænonympha mongolica (Ersch., MS.), Alphéraky, *l. c.* p. 426, pl. xv. fig. 26, Kulja.

Libytheidæ.

Libythea pulchra, sp. n., Butler, Ann. N. H. (5) x. p. 149, New Britain.

Erycinidæ.

Lemonias nais, W. H. Edwards (*Chrysophanus nais*, Edw., *olim*), discussed by Edwards and others ; Tr. Am. E. Soc. ix. pp. 7 & 8.

New species :—

Abisara suffusa, Moore, P. Z. S. 1882, p. 244, Chumba.

Eurygona abreas, W. H. Edwards, Tr. Am. Ent. Soc. ix. p. 3, Arizona.

Riodina lysippoides (= *lysippus*, Burm., *nec* Linn.), Berg, An. Soc. Arg. xiv. p. 167, Argentine Republic.

Siseme hothurus, id. *l. c.* p. 168, Argentine Republic.

Lemonias durii, New Mexico, p. 47, *ares*, p. 136, and *cleis*, Arizona, p. 137, W. H. Edwards, Papilio, ii.

Lycænidæ.

Alphéraky (Hor. Ent. Ross. xvi. pp. 376–397) discusses the *Lycænidæ* of Kulja, especially *Polyommatus phœnicurus*, Led., var. *margelanica*, Staud., MS., *Lycæna argus*, Linn., var. *planorum*, *anthracias*, Christoph, *astrarche*, Bergstr., *icarus*, Rott., *kindermanni*, Led., var. *iphigenia*, Herr.-Schäff., and *prosecusa*, Ersch. (♀ described).

Waterhouse (Aid, ii.) figures *Lycæna iburiensis*, pl. cviii., *Thecla orsedice*, pl. cvii., *ibara*, pl. cxiii., *regina*, fig. 1, *signata*, fig. 2, pl. cxiv., *Strymon fentoni* (all of Butler), fig. 2, and *Thecla butleri*, Fent., fig. 1, pl. cxv. *Polyommatus phlæas* and *Lycæna argiolus*, *argia* and *japonica*, noticed; the last three are probably broods: Pryer, Tr. E. Soc. 1882, p. 491.

Chrysophanus stygianus, Butl., = *phlæas*, var., Butler, Ann. N. H. (5) ix. p. 208.

Polyommatus dispar, Haw.: its occurrence near Moscow noticed; Albrecht, Bull. Mosc. lvi. 4, p. 376. *P. phlæas*: variety noticed; Hodge, Ent. xv. p. 130. *P. satraps*, Staud., is probably only the first brood of *asabinus*, Herr.-Schäff.; Staudinger, Hor. Ent. Ross. xvi. pp. 65 & 66. *P. bæticus*, Linn.: larva described from the Hawaiian Islands; Blackburn, Tr. E. Soc. 1882, pp. 31 & 32.

Lycæna argus, Linn. Schöyen (Ent. Tidskr. iii. pp. 33–62, figs. 1–7, and Ent. Nachr. viii. pp. 213, 214, & 276) discusses the identification of this species and its nearest ally in great detail, and gives their synonymy as follows:—1. *L. argus*, Linn. (= *idas*, Linn., ♀, *agon*, W. V., *argyrotoxus*, and *argyra*, Bergstr.; *leodorus*, *agidion*, and *agiades*, Gerh.; varr. *hypochiona*, Ramb., and *bella*, Herr.-Schäff.). 2. *L. argyrognomon*, Bergstr. (= *calliopis*, Boisd., *argus*, Hübn., var. *dubia*, Gerh. (= *acreon*, *ismenias*, and *lycidas*, Gerh.), and var. *agidion*, Meissn. (= *lapponica*, Gerh., and *idas*, Zett.). The outline, neuration, and scales of both species and the tibial spine of the first are figured. *L. adonis* and *corydon*: females differentiated; Thornewill & Sabine, Ent. xv. pp. 129, 130, & 160. *L. alexis*: hermaphrodite; Gibbs, Ent. xv. p. 89. *L. antægon*, Boisd., ♀ = *acmon*, Westw. & Hew.; Butler, J. L. S. xvi. pp. 468 & 469. *L. argus*, var. *argulus* from Switzerland described; Frey, MT. schw. ent. Ges. vi. p. 350. *L. astrarche*, var. *æstiva* noticed; Lallemand, CR. Ent. Belg. xxvi. p. c. *L. bætica* var. *armeniensis*, from Krasnovodsk, and *L. orion* var. *nigra* (Pech., MS.), from Budapest, described; Gerhard, B. E. Z. xxvi. pp. 125 & 126. *L. mithridates*, Staudinger, noticed by him; Hor. Ent. Ross. xvi. p. 66. *L. pheretes*, Hübn., var. *asiatica* from Sikkim

noticed ; Elwes, P. Z. S. 1882, p. 402. *L. pyrenaica*, Boisd., is quite distinct from *orbitulus*, Esp. ; Oberthür, Bull. Soc. Ent. Fr. (6) ii. pp. cli. & clii. *L. zephyrus*, *argus*, *ægon*, and *escheri*, var. *dalmatica* discussed ; Speyer, S. E. Z. xliii. pp. 379-382.

Cupido, sp. n., from S. Australia noticed and figured ; Tepper, Tr. R. Soc. S. Austr. iv. p. 31, pl. ii. fig. 3.

Holochila blackburni, Tuely. Larva described ; Blackburn, Ent. M. M. xix. p. 56.

Lycænesthes larydas, Hew., is quite distinct from *larydas*, Cramer ; Butler, Ann. N. H. (5) x. p. 150, note.

Thecla calanus, Hübn.: times of appearance of larva and imago ; W. H. Edwards, Canad. Ent. xiv. p. 28. *T. henrici*, Grote: oviposition and young larvæ ; *id.* Am. Nat. xvi. p. 123. *T. onyx*, Moore, ♂ described by him: it occurs in N. W. Himalayas, not Burma ; P. Z. S. 1882, p. 247. *T. quercus* : aberration ; White, Tr. Epping Nat. Club, ii. pp. lxxxii. & lxxxiii.

Strymon hyperici, Boisd. & Lec., is distinct from *melinus*, Hübn.; Butler, J. L. S. xvi. p. 469.

Ilerda saphir, Blanch.?, from Sikkim noticed and figured ; Elwes, P. Z. S. 1882, p. 402, pl. xxv. figs. 9 & 10. *I. tamu*, Koll., redescribed ; Moore, *l. c.* p. 248.

Amblypodia thamyras, Linn. (= *helius*, Cram.), noticed and figured ; Aurivillius, Sv. Ak. Handl. xix. 5, p. 109, pl. i. fig. 2.

New genera and species :—

Nadisepa, Moore, P. Z. S. 1882, p. 249. Allied to *Deudorix* ; type, *Papilio jarbas*, Fabr.

Baspa, id. *l. c.* p. 250. Allied to *Deudorix* ; type, *Papilio melampus*, Cram.

Bidaspa, id. *l. c.* p. 250. Allied to *Virachala* ; type, *Thecla nissa*, Koll.

Hysudra, id. *l. c.* Allied to last ; type, *Deudorix selira*, Moore.

Panchala, id. *l. c.* p. 251. Allied to *Amblypodia* ; type, *A. ganesa*, Moore.

Curetis solita, Butler, Ann. N. H (5) x. p. 149, New Britain.

Holochila regina, id. *l. c.* p. 150, Duke of York Island.

Miletus scintillans, id. *ibid.*, New Britain.

Lampides astarte and *complicata*, id. *l. c.* pp. 150 & 151, New Britain.

Thestor romanovi, Christoph, Hor. Ent. Ross. xvii. p. 106, Russian Armenia.

Polyommatus splendens (Staudinger, MS.), Alphéraky, Hor. Ent. Ross. xvi. p. 376, pl. xiv. fig. 12, Ala Tau, Kulja; *P. ellisi*, Marshall, J. A. S. B. li. pt. 2, p. 41, pl. iv. fig. 4, N. W. Himalayas ; *P.* (*Cyaniris*) *lambi*, Distant, Ann. N. H. (5) x. p. 245, Province Wellesley.

Lycæna melanotoxa, Marott, Giorn. Sc. Palerm. xiv. p. 54, pl. iii. figs. 14 & 15, Sicily; *L. torgouta*, figs. 5 & 6, p. 380, *sinensis*, fig. 7, Tian-Chian, p. 383, *sarta*, fig. 8, Fergana, Tian-Chian, p. 387, *buddhista*, figs. 9 & 10, Kulja, p. 393, and *persephatta*, fig. 11, Fergana, Kulja, p. 395, Alphéraky, *l. c.* pl. xiv. ; *L. sutleja*, Moore, P. Z. S. 1882, p. 246, Kangra ; *L.*

aster, W. H. Edwards, Canad. Ent. xiv. p. 194, Newfoundland; *L. annetta*, id. Papilio, ii. p. 48, Utah; *L. cyna*, id. Tr. Am. Ent. Soc. ix. p. 3, Texas; *L. perrulgatus* and *paradoxa*, Guest, Tr. R. Soc. S. Austr. v. p. 36, Adelaide.

Cupido aneus, fig. 9, p. 29, *simplexa*, fig. 10, *delicata*, fig. 12, *fasciola*, fig. 13, p. 30, and *adamapuncta*, fig. 16, p. 31, ♂ described (Guest, *l. c.* v. p. 36); Tepper, Tr. R. Soc. S. Austr. iv. pl. ii., S. Australia. *C. molybdena*, Guest, *l. c.* v. p. 36, Adelaide.

Cyaniris huegeli, Moore (= *argiolus*, Koll., *nec* Linn.); Moore, *l. c.* p. 244, N. W. Himalaya.

Tarucus alteratus, N. W. Himalaya, figs. 4 & 4*a*, and *venosus*, Dharmsala, figs. 6 & 6*a*, *id. l. c.* p. 245, pl. xii.

Horaga viola, id. *l. c.* p. 248, Dharmsala.

Herda coruscans, id. *l. c.* N. W. Himalaya.

Thecla itys, *leda*, p. 23, *ines*, p. 25, and *apama*, p. 137, W. H. Edwards, Papilio, ii., Arizona; *T. acastoides* (= *acaste*, Burm., *nec* Prittw.), Berg, An. Soc. Arg. xiii. p. 169, Argentine Republic.

Sithon moorii, Distant, *l. c.* p. 246, Province Wellesley, Malacca, Sumatra.

Hypolycæna periphorbas, Butler, *l. c.* p. 152, New Britain; *H. chandana*, Moore, *l. c.* p. 249, pl. xi. figs. 2 & 2*a*, Lahoul.

Aphnæus trifurcata[*-tus*] and *uniformis*, id. *l. c.* p. 251, N. W. Himalaya.

Amblypodia minnetta, Butler, *l. c.* p. 152, Duke of York Island.

HESPERIIDÆ.

KING, H. S. Internal organization of *Hesperia ethlius*, Cram., as observed in the living animal. Psyche, iii. pp. 322–324.

Chiefly relates to the larva, which is somewhat diaphanous.

PLÖTZ, C. Einige Hesperiinen-Gattungen und deren Arten. B. E. Z. xxvi. pp. 71–82, & 253–266.

Includes tables of the species of *Proteides*, *Telemiades*, Hübn., *Netrocoryne*, Feld., *Telegonus* and *Celænorrhinus*, Hübn., *Pellicia*, Herr.-Schäff., *Arteurotia*, Butl., *Æthilla*, Hew., *Cogia*, Butl., *Cecropterus*, Herr.-Schäff., *Plesioneura*, Feld., *Lychnuchus*, Hübn., *Sophista*, Plötz, and *Udranomia*, Butl. The following synonymy occurs:—*Proteides compressa*, Möschl., = *amphion*, Hübn.; *Telemiades avitus*, Cram. (354, E. *nec* D.) and *arcturus*, Herr.-Schäff., = *epicalus*, Hübn.; *mygdon*, Möschl., = *ceramina*, Herr.-Schäff.; *morpheus*, Cram., and *amyntas*, Fabr., = *phocus*, Cram.; *Netrocoryne vulpecula*, Prittw., = *repanda*, Feld.; *cæcutiens*, Herr.-Schäff., = *porcius*, Feld.; *cæcutiens*, var., Herr.-Schäff., renamed *damias*; *Telegonus rhetus*, Fabr., and *quadratus*, Sepp, = *midas*, Cram.; *muretus*, Fabr., = *salatis*, Cram.; *sebrus*, Feld., = *ramusis*, Cram.; *crameri*, Latr., = *sebaldus*, Cram., and *sebaldus*, Westw., = *doriscus*, Hew.; *Pellicia rubescens*, Möschl., = *ephora*, Herr.-Schäff.; *bromius*, Sepp, = *bessus*, Möschl.; *Arteurotia ribbei*, Staud., = *tractipennis*, Butl. & Druce; *Æthilla jariba*, Butl., = *cretellus*, Herr.-Schäff.; *Cecropterus brontes*, Fabr.,

= *aunus*, Fabr.; *Plesioneura alysos*, Moore, = *curvifascia*, Feld.; *Lynuschus celsus*, Latr., and *syllius*, Feld., = *hiarbas*, Cram.

[Plötz, C.] Die Hesperiinen-Gattung *Eudamus* und ihre Arten. Fortsetzung. S. E. Z. xliii. pp. 87–101.

Contains species 22–82 inclusive. The following synonymy occurs:—*E. parmenides*, Cram. (= *creteus*, Hübn.), *creteus*, Cram. (= *bifascia*, Herr.-Schäff.), *alardus*, Stoll (= *creteus*, Latr.), *pseudexadeus*, Westw. (= *tityrus*, Herr.-Schäff.), *barisses*, Hew. (= *tmolus*, Burm.), *festus*, Hübn. (= *cellus*, Boisd. & Lec.), *pylades*, Scudd. (= *bathyllus*, Harr., *nevada*, Scudd.), *daunus*, Cram. (= *bathyllus*, Smith & Abb., = *niso*, Hübn.), and *casica*, Herr.-Schäff. (= *epigena*, Butl., and *orestes*, Lintn.); *Typhedanus umber*, Herr.-Schäff. (= *zephus*, Butl.).

——. Die Hesperiinen-Gattung *Hesperia*, Ant., und ihre Arten. *L. c.* pp. 214–244, & 436–456.

226 species tabulated, many new; but the paper is not quite completed. The following is the most important synonymy given:—*H. cassander*, Fabr. (= *derasa*, Herr.-Schäff.), *sandarae*, Herr.-Schäff. (= *palva*, Hew.), *remus*, Fabr. (= *centralis*, Herr.-Schäff.), *cilissa*, Hew. (= *smaragdulus*, Herr.-Schäff.), *phidon*, Cram. (= *pyrophorus*, Sepp), *comyndon*, Fabr. (= *julianus*, Latr.), *godarti*, Latr. (= *ceraca*, Hew.), *chalestra*, Hew. (= *concors*, Herr.-Schäff.), *argentea*, Hew. (= *devanes*, Herr.-Schäff.), *brino*, Cram. (= *idos*, Linn.), *comus*, Cram. (= *helops*, Drur.), *ebusus*, Cram. (= *psecas*, Cram., = *belistida*, Hew.), *attina*, Hew. (= *cruda*, Herr.-Schäff.), *ethlius*, Cram. (= *olynthus*, Boisd. & Lec.), *telegonus*, Esp. (= *salius*, Hübn., = *longirostris*, Sepp), *himella*, Hew. (= *calus*, Herr.-Schäff.), *caniola*, Herr.-Schäff. (= *canenta*, Butl.), *æcas*, Cram. (= *pertinax*, pt. Latr., *saturnus*, Hübn., *æacus*, Swains, *amœna*, Hew.), *memuca*, Hew. (= *propertius*, Hew., *nec* Fabr.), *phyllus*, Cram. (= *marcus*, Latr., *nec* Fabr.), *lefrenayi*, Latr. (= *pica*, Herr.-Schäff.).

Alphéraky (Hor. Ent. Ross. xvi. pp. 430–432) notices the *Hesperiidæ* of Kulja, especially *Syrichthus staudingeri*, Speyer, pl. xv. fig. 27, and *comma*, Linn., var. *mixta*.

Hesperia spio (= *vindex*, Cram.), and *Pamphila niso* (= *hottentotta*, Latr., and *zetterstedti*, Wallengr.), Linn., noticed and figured; Aurivillius, Sv. Ak. Handl. xix. 5, pp. 124 & 125, pl. i. figs. 3, 3*a*, 4, & 4*a*.

Goniloba (*Eudamus*) *tityrus*, Fabr. Larvæ noticed; Reed, Canad. Ent. xiv. p. 160 (*cf.* also Moffat, *tom. cit.* p. 200).

Pyrrhopyge amra and *patrobas*, Hew., habits, and *acastus*, Cram., transformations noticed; Mathew, Ent. M. M. xix. pp. 18 & 19.

Hesperia premnas, Wallengr. (= *physoptila*, Burm.) noticed; Berg, An. Soc. Arg. xiii. p. 169.

Thracides ethemides, Burm., = *dalmanni*, Latr.; *id. l. c.* p. 170.

Pamphila deva, *nereus*, *Pholisora alpheus*, Edw., *Eudamus epigena*, Butl., and *Pyrrhopyga araxes*, Hew., redescribed; W. H. Edwards, Papilio, ii. pp. 138–142. (*P. deva* also noticed; Tr. Am. Ent. Soc. ix. p. 4.)

Pholisora pirus, W. H. Edwards, ♀ noticed by him; Tr. Am. Ent. Soc. ix. p. 7.

Butleria cauquenensis and *vicina*, Reed, figured by Waterhouse, Aid. i. pls. lxxxvii. & xcvi.

Nisoniades ennais, Scudd. & Burg., probably = *juvenalis*, Fabr.; Butler, J. L. S. xvi. p. 473.

Pyrgus syrichthus, Fabr. Larva described and figured; Dewitz, Verh. L.-C. Ak. xliv. p. 249, pl. viii. figs. 11 & 11a.

Sophista, g. n., Plötz, B. E. Z. xxvi. p. 264. Placed between *Lynuchus*, Hubn., and *Udranomia*, Butl.; types, *Thracides aristoteles*, Westw., and *S. plinius*, sp. n., *l. c.* p. 265, S. America.

New species :—

Eudamus orphne, Rio, *orpheus*, Para, *justus*, S. America, p. 88, *hopfferi* (? = *alector*, var., Herr.-Schäff.), S. America, p. 90, *blasius*, Plötz (= *elorus*, Herr.-Schäff., *nec* Hew.), Cuba, p. 91, *gundlachi*, Porto Rico, p. 92, *scheba*, S. America, *rochus*, Brazil, p. 94, *ignatius*, locality unknown, p. 95, *phlius*, Brazil, p. 97, *schæfferi* (= *caicus*, Herr.-Schäff., *nec* Hew.), locality not stated, *valeriana* and *ananius* (= *mexicana*, Herr.-Schäff., *nec* Feld.), Mexico, *nicomedes*, Brazil, p. 99, *albo-ciliata* (Mab., MS.), Colombia, and *jalapus*, Jalapa, p. 100; Plötz, S. E. Z. xliii.

Eudamus hippalus, p. 27, *dorus*, p. 140, *moschus*, p. 141, W. H. Edwards, Papilio, ii., Arizona.

Telegonus corentinus, Surinam, p. 78, *gaurus*, Rio Negro, *ophiuchus*, Surinam, p. 79, *mutius* (Weym., MS.), Colombia, *cœnosa* (Herr.-Schäff., MS.), S. America, p. 80, *tychios*, Bahia, p. 81, *lucca* and *pertica* (Weym., MS.), S. America, p. 82, Plötz, B. E. Z. xxvi.

Æthilla weymeri, locality unknown, p. 257, *toxeus*, Mexico, *nocera*, Colombia, *primus*, Brazil, and *melas*, Rio Janeiro, p. 258, *id. l. c.*

Udranomia ambla (Herr.-Schäff., MS.), *id. l. c.* p. 266, S. America.

Ismene (*Choaspes*) *crawfurdi*, Distant, Ann. N. H. (5) x. p. 247, Province Wellesley.

Hesperia pulla (Hopff., MS.), Java, *paria* and *achelous*, Chiriqui, *infuscata* (Hopff., MS.), Brazil, *caura*, Surinam, p. 315, *ina*, Chiriqui, *insignis*, La Guayra, *rubida* (= *umber*, Herr.-Schäff.), S. America, *irma*, Colombia, p. 316, *depuncta* (Herr.-Schäff., MS.), Rio, p. 317, *crispinus*, Mexico, *rivera*, *gabinus*, Rio, *bias*, S. America, *perloides*, Brazil, p. 318, *perla*, Rio, *circellata*, Brazil, *leucopogon* (Becker, MS.), La Guayra, p. 319, *lycanoides* (Prittw., MS.), *antistia* (Prittw., MS.), Rio, *pruinosa*, S. America, *abdon*, Brazil, p. 320, *acrœa*, Colombia, p. 321, *fimbriata*, Mexico, *violascens* (Maass., MS.), locality unknown, p. 322, *ochrope* (Hopff., MS.), Para, p. 323, *peratha*, Bahia, *nealces* (Hopff., MS.), Rio, p. 324, *alda*, Brazil, *schultzi* (Homeyer, MS.), Angola, p. 326, *trimaculatus* (Herr.-Schäff., MS.), Brazil, p. 327, *cordela*, locality unknown, *elisa*, Brazil, p. 328, *luscinia* (Weym., MS.), Blumenau, p. 329, *adjuncta*, Colombia, p. 332, *beskii*, New Friburg. p. 334, *livia*, locality unknown, p. 335, *ocrinus* (Hopff., MS.), Colombia, p. 337, *anitta*, locality unknown, *nanneta*, Rio, p. 340, *catochia*, Mexico, p. 342, *pelora*, Brazil, p. 344, *nirvana*, Java, p. 436, *valentina*, Surinam, *replana*, Brazil, p. 437, *socles*, S. America, *emacareus* (Herr.-Schäff., MS.), Venezuela, p. 438, *æas*, Chiriqui, *cabenta* (Hopff., MS.), p. 439, *diores*, S. America, *elana*, Brazil, p. 441, *silanion* (=

hylaspes, Herr.-Schäff.), *ozeta* (Hopff., MS.), Bahia, *metella*, p. 442, *jebus*, Brazil, *melaleuca* (Weym., MS.), Rio, p. 443, *cinica*, Para, p. 444, *chloris* (Möschl., MS.), Surinam, *zisa*, Rio, p. 446, *hypodesma* (Hopff., MS.), Para, Rio, *cuneata*, S. America, *hesiodes*, Cap. Rico, p. 447, *hersilia* (Prittw., MS., = *virbius*, Möschl.), Rio, p. 448, *senex*, Rio, p. 449, *roncilgonis* (Homeyer, MS.), Angola, p. 450, *eucherus* (= *fantasus*, Sepp, *nec* Cram.), Surinam, p. 452, *elvira*, S. America, p. 453, *lycca*, p. 454, *aurelius*, Brazil, p. 455, *monacha* (Hopff., MS.), *peninsularis* (Hopff., MS.), Para, and *zola*, Surinam, p. 456, Plötz, S. E. Z. xliii.

Proteides zethos, *antiope*, *nicola*, Para, &c., p. 71, and *æsopus*, Java, p. 72, id. B. E. Z. xxvi.

Telemiades vulpecula (Hopff., MS.), and *solon*, id. *l. c.* pp. 73 & 75, S. America.

Halpe sikkima and *separata*, Moore, P. Z. S. 1882, p. 407, Sikkim.

Pamphila uralus, p. 36, *pittacus*, p. 138, and *python*, p. 139, W. H. Edwards, *l. c.*, Arizona; *P. harpalus*, p. 3, *cubelus*, Nevada, *verus*, California, p. 4, *regulus*, Florida, *lagus*, Texas, Colorado, *taxiles*, Arizona, S. Colorado, Nevada, California, p. 5, *id.* Tr. Am. Ent. Soc. ix.; *P. repetita* and *albiclavata*, Butler, Ann. N. H. (5) x. p. 155, Duke of York Island.

Amblyscirtes simius, W. H. Edwards, Tr. Am. Ent. Soc. ix. p. 6, Colorado; *A. nanno*, id. Papilio, ii. p. 142, Arizona.

Copaodes wrighti, id. Canad. Ent. xiv. p. 152, California. *C. myrtis*, id. Papilio, ii. p. 26, Arizona.

Pholisora ceos, id. *l. c.* p. 140, Arizona.

Pellicia licisca, Nicaragua, *rubescens* (Prittw., MS.), Rio Janeiro, *corinna* (= *dimidiata*, Herr.-Schäff.), Mexico, p. 254, *theon*, *zamia*, and *tyana*, South America, p. 255, Plötz, *l. c.*

Pyrgus nearchus, W. H. Edwards, *l. c.* p. 26, Arizona; *P.* (*Syrichthus*) *nobilis*, Staudinger, B. E. Z. xxvi. p. 176, Samarcand.

Plesioneura leucographa, India, *varians* (Maassen, MS.), South Asia, *chimæra* (Keferst., MS.), India, p. 262, and *waigensis*, Waigiou, p. 263, Plötz, l. c.; *P. cameroni*, Distant, *l. c.* p. 248, Province Wellesley, Penang; *P. insulata*, Butler, *l. c.* p. 154, New Britain.

Lychnuchus focula, Java, p. 263, *rubecula* (Weym., MS.), *lætitia* (Weym., MS.), Borneo, *clearchus*, South America, p. 264, Plötz, *l. c.*

Netrocoryne coronus, Chiriqui, *seneca*, Brazil, *id. l. c.* p. 77.

Telesto flammeata, *eclipsis*, and *compacta*, Butler, *l. c.* (5) ix. pp. 85–87, Melbourne.

Arteurotia demetrius, Brazil, p. 255, *bufonia* (Hopff., MS.), Bahia, and *epipola* (Maassen, MS.), Cayenne, p. 256, Plötz, *l. c.*

Cogia punctilia (Hopff., MS.), *id. l. c.* p. 259, Santarem.

Ancyloxypha lena, W. H. Edwards, Canad. Ent. xiv. p. 5, Montana.

Hesperilla bifasciata, fig. 4, *trimaculata*, fig. 1, *quadrimaculata*, fig. 2, p. 32, *atralba*, fig. 5, *butea*, fig. 6, p. 33, and *gracilis*, fig. 7, p. 34, Tepper, Tr. R. Soc. S. Austr. iv. pl. ii., S. Australia; *H. fumosa*, Guest, *op. cit.* v. p. 37, Adelaide.

Thanaos tatius and *clitus*, W. H. Edwards, Papilio, ii. pp. 179 & 180, United States.

Cecropterus longipennis (Herr.-Schäff., MS.), South America, *koluthos*,

Colombia, *orontes*, La Guayra, *lunulus* (Herr.-Schäff., MS.), South America, *cincta* (Herr.-Schäff., MS.), Oaxaca, p. 261, and *bocus* (Hopff., MS.), Parà, p. 262, Plötz, *l. c.*

Tagiades clericus and *presbyter*, Butler, *l. c.* (5) x. p. 154, Duke of York Island.

Megathymus neumœgeni, W. H. Edwards, *l. c.* p. 27, Arizona.

Sphingidæ.

Behr, H. On the Habits and Economy of some species of *Sphingidæ*. Papilio, ii. pp. 1–7.

Relates chiefly to *Dilephila lineata*, var. *daucus*; *Philampelus achemon*; *Macrosila carolina* and *quinque-maculata*; *Sphinx pinastri* and *Ph.* (sic) *nerii*. The roving habits of the *Sphingidæ* probably hinder them from ever becoming very destructive to vegetation.

Grote, A. R. Some Notes and Queries about Moths. Papilio, ii. pp. 170–176.

Contains general remarks on North American *Sphingidæ*, and three tables. (1) Genera of European and Asiatic extraction. (2) Genera of South American extraction. (3) Genera peculiar to North America.

Johnson, T. Illustrations of British Hawk-Moths (including the *Sesiidæ*) and their Larvæ, with the plants on which they feed; with figures drawn and coloured by the author from specimens in his cabinet. 1874 (privately published ?), 8vo, pp. 46, col. pls. xxxvi.

Moore (Lep. Ceyl. ii.) redescribes and figures, generally with transformations:—*Nephale hespera*, Fabr., pl. lxxii. p. 2; *Diludia discistriga*, Walk., pl. lxxiii., *vates*, figs. 1 & 1*a*, p. 3, *obliqua*, Walk., fig. 2, pl. lxxiv. p. 4; *Protoparce orientalis*, Butl., pl. lxxv. p. 5; *Acherontia lachesis*, Fabr., pl. lxxvii. p. 6, *styx*, Westw., pl. lxxvi. p. 7; *Cypa ferruginea*, Walk., pl. lxxix. fig. 3, p. 8; *Leucophlebia bicolor*, Butl., pl. lxxx. fig. 3, p. 10; *Ambulyx auripennis*, Moore, pl. lxxix. figs. 1, 1*a* & *b*, p. 11, *turbata*, pl. lxxx. fig. 1, p. 12; *Amblypterus panopus*, Cram., pl. lxxxi. p. 13; *Daphnis nerii*, Linn., pl. lxxxii. p. 14, *hypothous*, Cram., pl. lxxxiii. p. 15; *Hippotion celerio*, pl. lxxxiv. fig. 4, p. 16; *Xylophanes oldenlandiæ*, pl. lxxxv. p. 17, *prunosa*, Butl., pl. lxxxiv. fig. 2, *pinastrina*, Mart. (= *silhetensis*, Walk., and *bisecta*, pt. Moore), pl. lxxxvii. fig. 2; *Isoples theylia*, Linn., fig. 5, *rafflesi*, Butl., fig. 3, p. 19; *Gnathothlibus pallicosta*, Walk., fig. 6, pl. lxxxiv. p. 21; *Theretra nessus*, pl. lxxxvi. fig. 1, p. 22; *Pergesa acteus*, Cram., pl. lxxxviii. p. 23; *Acosmeryx cinerea*, Butl., pl. lxxxix. figs. 2 & 2*a*, p. 24; *Panacra vigil*, Guér., pl. lxxxvii. figs. 3, 3*a* & *b*, p. 25; *Ingonyx testacea*, Walk. (= *emilia*, Boisd., and *ella*, Butl.), pl. lxxxix. fig. 1, p. 26; *Rhamphoschisma imperator*, Butl., fig. 1, *rectifascia*, Feld., fig. 2, pl. xc., *divergens*, Walk., fig. 2, p. 27, *nigrifasciata*, fig. 1, pl. xcii., *glaucoptera*, Butl., fig. 2, p. 28; *Macroglossa proxima*, Butl., figs. 1*a* & *b*, pl. xci., *toxicolor*, Moore, pl. xc. figs. 3 & 3*a*, p. 29, *insipida*, Butl., pl. xcii. figs. 3*a* & *b*, *affictitia*, Butl., fig. 3, *vialis*, Butl., fig. 2, *gyrans*, Walk., fig. 1, p. 30; *Cephonodes hylas*, Linn., figs. 4*a* & *b*, pl. xciii. p. 31.

Notes on *Sphingidæ* in Massachusetts, the habits of *Dilephila lineata*, and the eggs of *Smerinthus excæcatus* are specially noticed; Goodell, Psyche, iii. pp. 367 & 368.

Elongate concavity on the anterior border of abdominal joints five to seven of pupæ of certain *Sphingidæ*, noticed as possibly a sound-producing organ: Riley, Nature, xxvi. p. 366, Am. Nat. xviii. pp. 745 & 746.

Thirty-two *Sphingidæ* inhabiting Ontario are described, and several figured in different stages; Baynes-Reed, Rep. E. Soc. Ont. 1881, pp. 48–70, figs. 22–40.

Dilephila euphorbiarum, Boisd. (= *spinifascia*, Butl., = *celeno*, Boisd.), *D. annei*, Guér., and *Protoparce eurylochus*, Phil. (= *Sphinx cestri*, Blanch.), larvæ described and figured; Edmonds & Butler, Tr. E. Soc. 1882, pp. 2 & 3, pl. i. figs. 1–3.

Larvæ of *Thyreus abbotti*, *Amphion nessus*, *Philampelus achemon* and *pandorus* noticed; Saunders, Papilio, ii. p. 147.

Dilophonota cercyon, Burm. (= *lassauxi*, Boisd.), *D. picta*, Sepp. (synonyms, ? *Sphinx penæus*, Fabr., *Ancerya piperis*, Boisd., *A. picta*, Möschl., and *D. hippothoon*, Burm.), *D. obscurus*, Fabr. (= *A. rhœbus*, Boisd., and *Erinnyis stheno*, Geyer), noticed; Berg, An. Soc. Arg. xiii. pp. 170 & 171.

Acherontia atropos and *Dilephila elpenor*: variation in larvæ; Höfner, JB. Mus. Kärnten, xv. p. 200.

Acherontia atropos and *Sphinx ligustri* entering beehives; Katter, Ent. Nachr. viii. pp. 319 & 320.

Indian hawk-moth larva simulating a snake; Johnson, Nature, xxvii. pp. 126 & 127, woodcut.

Chœrocampa aspersata, Kirby, and *Philampelus ornatus*, Butl., figured by Waterhouse, Aid, i. pls. xcvii. & cxvi.

Macroglossa mimicking humming-birds and bees; Krause, Kosmos, xii. pp. 140–143, woodcut. *M. bombyliformis*, var. *robusta* from Tian Shan, described; Alphéraky, Hor. Ent. Ross. xvii. p. 17. *M. hylas*, Linn., var.: larva and pupa described and figured; Dewitz, Verh. L.-C. Ak. xliv. pp. 266 & 267, pl. ix. figs. 9, 9A & B.

Rhamphoschisma, Wallengr.: on the use of this generic name; Butler, Ann. N. H. (5) x. pp. 157 & 158.

Daraæa versicolor, Harr.: larva noticed; Fischer, Bull. Buff. Soc. iv. p. 62.

Pergesa cresus, Dalm: larva described and figured; Dewitz, *l. c.* pp. 249 & 250, pl. viii. fig. 9.

Chœrocampa elpenor feeding on *Circæa lutetiana*; Kane, Ent. xv. p. 234. Fight between two full-grown larvæ, resulting in the death of both; Schrebank, Ent. Nachr. viii. pp. 193 & 194. *C. elpenor* and *porcellus*: supposed hybrid; Lampa, Ent. Tidskr. iii. pp. 2 & 95.

Dilephila lineata, Fabr.: unusual abundance in 1880, the moths being on the wing at all hours of the day; Parker, Psyche, iii. p. 342.

Philampelus satellitia, Linn., and larva popularly described and figured; Saunders, Rep. E. Soc. Ont. 1881, pp. 18 & 19, figs. 1 & 2.

Smerinthus populi: double-brooded; Mathew, Ent. xviii. p. 211. *S. tiliæ*: varieties noticed; Frohawk & Adamson, Ent. xv. pp. 130 & 161.

Acherontia atropos in the Baltic, eighteen or twenty miles from land; Wahnschaffe, Ent. Nachr. viii. pp. 320 & 321. Taken in the North Sea, 2[illegible] miles from land; Winder, Sci. Goss. xviii. pp. 262 & 263. Duration of pupa state; Milburn & Anderson, *op. cit.* pp. 94, 165, & 166. It is not an immigrant, but truly acclimatized in France; Constant, Bull. Soc. Ent. Fr. (6) ii. pp. lxxvi. & lxxvii.

Sphinx catalpæ, Boisd., pp. 189–193, pl. xiii., and *hageni*, Grote, pp. 193 & 194, pl. xii. fig. 2: transformations described and figured; Riley, Rep. Ins. 1882. *S. carolina*: variation of larva; Leidy, P. Ac. Philad. 1882, pp. 237 & 238. *S. 5-maculata*: on destroying larvæ; Claypole, Canad. Ent. xiv. p. 18, and Rep. E. Soc. Ont. 1881, p. 33. *S. thyelia*, Linn., is not a *Chærocampa*, but probably a *Panacra*; Aurivillius, Sv. Ak. Handl. xix. 5, pp. 140 & 141. *S.* (*Protoparce*) *cingulata*, var. *decolora* from Florida described; H. Edwards, Papilio, ii. p. 11. *S.* (*Pseudosphinx*) *tetrio*, Linn.: young larva described and figured; Dewitz, *l. c.* pp. 250 & 251, pl. viii. figs. 2 & 2A.

Phlegethontius celæus. Brown variety of larva described; Grote, Papilio, ii. p. 99.

New genera and species:—

Marumba, Moore, Lep. Ceyl. ii. p. 8. Allied to *Triptogon*; to include *Smerinthus dyras*, Walk. (type), pl. lxxviii., and *Triptogon ceylonica*, Butl., pl. lxxix. fig. 2; redescribed, *l. c.* p. 9.

Hathia, id. *l. c.* p. 19. Allied to *Theretra*; type, *Sphinx clotho*, Dru., pl. lxxvii. fig. 1. Add *Chærocampa lucasi*, Walk., fig. 3, and *C. tenebrosa*, Moore, figs. 2 & 2*a*, pl. lxxxvi.; redescribed, *l. c.* p. 20.

Exedrium, Grote, New Check List, p. 11. Not characterized; type, *Sphinx halicarniæ*, Streck.

Macroglossa fulvicaudata and *calescens*, Butler, Ann. N. H. (5) x. pp. 155 & 156, New Britain.

Rhamphoschisma godeffroyi, id. *l. c.* p. 157, Duke of York Island.

Proserpinus circæ, H. Edwards (= *gauræ*, Streck., *nec* Smith & Abb.), Papilio, ii. p. 9, Georgia.

Cautethia grotii, id. *l. c.* p. 10, Florida.

Panacra insignis, Andaman Islands, and *imitans*, Delagoa Bay, Butler, *l. c.* p. 432; *P. rutherfordi*, Druce, Ent. M. M. xix. p. 16, Cameroons.

Diodosida roseipennis, Butler, *l. c.* p. 433, Delagoa Bay.

Darapsa rosæ, id. *ibid.*, Delagoa Bay.

Chærocampa monteironis, id. *l. c.*, Delagoa Bay; *C. godmani*, Druce, *l. c.* p. 16, Chiriqui; *C. wolfi*, id. P. Z. S. 1882, p. 778, pl. lx. fig. 1, Ecuador.

Daphnis andamana, Andaman Islands, and *torenia*, Fiji, *id.* Ent. M. M. xix. p. 16; *D. layardi*, Moore, Lep. Ceyl. ii. p. 16, pl. lxxxiv. fig. 1, Ceylon.

Ambulyx elwesi, Darjiling, and *argentata*, Cochin China, Druce, *l. c.* p. 17; *A. thwaitesi*, Moore, *l. c.* p. 11, pl. lxxx. figs. 2, 2*a*, & *b*, Ceylon.

Triptogon rosea, Cameroons, and *cytis*, Vaal River, Druce, *l. c.* pp. 17 & 18.

Nephele anomala, Butler, *l. c.* p. 434, Aburi, Gold Coast.

Diludia macromera, id. *l. c.* p. 435, Sarawak.

Pseudosmerinthus carteri and *virescens*, Butler, *l. c.* p. 435, Aburi, Gold Coast.

Dilophonota festa, H. Edwards, *l. c.* p. 11, Texas.

Smerinthus (?) *wagi*, Topper, Tr. R. Soc. S. Austr. v. p. 29, S. Australia.

Protoparce schmeltzi, Butler, *l. c.* p. 158, Australian region; *P. lanchesana*, Druce, *l. c.* p. 18, West Africa.

Hylæus reevii, Druce, *ibid.*, Paraguay.

ÆGERIIDÆ.

EDWARDS, H. Notes on North American *Ægeriidæ*, with descriptions of new forms. Papilio, ii. pp. 52–57 & 96–99.

The following known species are noticed:—*Bembecia marginata*, Harr. (= *Trochilium rubi*, Harr., and *Sesia flavipes*, Hulst), *Trochilium syringæ*, Harr. (= *Grotea longipes*, Möschl.); *T. tibiale*, Harr., ♀ noticed, *Ægeria exitiosa*, var. *fitchi*, from the Southern States, *asiliformis*, Rott., *tipuliformis*, Linn., var. (?) from Ohio, and *quinque-caudata*, Rid., ♀ described; *Sospita*, H. Edw., *nec* Hew., renamed *Phemonoe*, H. Edwards (p. 97); *Trochilium gallivorum*, Westw., description reprinted.

Trochilium apiforme, Linn.: life history; Tomalin, J. Northampton Soc. ii. pp. 112–116, plate: hermaphrodite described and figured; O. Herman, Term. füzetek, v. pp. 194–196 & 275–277, pl. v. figs. 1 & 2. *T. melanocephalum*, Dalm, noticed; Aurivillius, Ent. Tidskr. iii. pp. 121 & 122.

Ægeria acerni, Clem.: transformations popularly described and figured; Saunders, Rep. E. Soc. Ont. 1881, p. 20, fig. 4. *Æ. syringæ*: parasites noticed; Osborn, Papilio, ii. pp. 71 & 72. *Æ. tricincta*, Harr.: larva noticed; Kellicott, Bull. Buff. Soc. iv. p. 62.

Sesia cruentata, Mann, discussed; Ragusa, Nat. Sicil. i. pp. 223 & 224.

Sciapterum tabaniforme, Rott., var. *kungessana* from Kulja described; Alphéraky, Hor. Ent. Ross. xvii. p. 20.

Melittia cucurbitæ hybernates in the larva state; Coleman, Papilio, ii. p. 50.

New genera and species:—

Phlogothauma, Butler, Ann. N. H. (5) x. p. 237. Allied to *Paranthrene*; type, *P. scintillans*, sp. n., *l. c.* p. 238, New Britain.

Alcathoe, H. Edwards, Papilio, ii. p. 53. Caudal appendages of ♂ as long as the abdomen; fore-wings opaque in ♀, and partly transparent in ♂; hind tibiæ tufted as in *Melittia*. Type, *Trochilium caudatum*, Harr.

Harmonia, id. *l. c.* p. 54. Allied to *Sciapterum*; type, *H. morrisoni*, sp. n., *l. c.* p. 55, Montana: add *Ægeria pini*, Kell.

Fatua, id. *l. c.* p. 97. Allied to *Trochilium*; type, *T. denudatum*, Harr. (♂ described, *l. c.*; ? = *Sesia asiliformis*, Boisd.).

Melittia snowii and *amœna*, id. *l. c.* p. 53, Kansas.

Sciapterum admirandus[*-dum*], id. *l. c.* p. 54, Texas.

Albuna denotata, id. *l. c.* p. 55, Montana.

Ægeria tecta, Arizona, and *henshawii*, Labrador, p. 56, *præstans*, Washington Territory, *querci*, p. 98, *prosopis*, p. 99, and *candescens*, Arizona, p. 123, *id. l. c.*

Pyrrhotænia behrensi, id. *l. c.* p. 123, California.

Trochilium przewalskii, Alphéraky, Hor. Ent. Ross. xvii. p. 18, pl. i. fig. 28, Kulja.

Sesia serica, id. *l. c.* p. 21, pl. i. fig. 29, Kulja.

Sara pryeri, Druce, Ent. M. M. xix. p. 15, N. E. Borneo.

Uraniidæ.

Lyssidia goldiei, sp. n., Druce, P. Z. S. 1882, p. 781, New Guinea.

Castniidæ.

Castnia eudesmia, Gray. Habits and transformations noticed; Edmonds & Butler, Tr. E. Soc. 1882, p. 4, and note.

Castnia cowani and *buckleyi*, spp. nn., Druce, P. Z. S. 1882, p. 778, pl. lx. figs. 2 & 3, Ecuador.

Hespagarista tigrina, sp. n., *l. c.* fig. 4, Calabar and Cameroons.

Synemon obscura and *livida*, spp. nn., Tepper, Tr. R. Soc. S. Austr. iv. p. 35, pl. ii. figs. 5 & 6, S. Australia.

Agaristidæ.

Moore (Lep. Ceyl. ii. pl. xciv.) redescribes and figures *Ægocera venulia*, Cram., fig. 1, p. 32, *bimacula*, Walk., fig. 2, p. 33, and *Episteme nigripennis*, fig. 3, p. 34.

Alypia octo-maculata, Fabr., noticed; Lyman, Canad. Ent. xiv. p. 228.

Euschirropterus poeyi, Grote. Larva and pupa described and figured; Dewitz, Verh. L.-C. Ak. xliv. p. 255, pl. viii. figs. 10 & 10a–10c.

Agarista lewini, Boisd., *casuarinæ*, Scott [= *contorta*, Walk.], and *glycinæ*, Lew. Transformations described and figured; McCoy, Prodr. Zool. Vict., Dec. i. pl. viii. [1878].

Fennaria sevorsa, Grote, belongs to *Phægarista*; Grote, Papilio, ii. p. 189.

Eusemia vectigera, sp. n., Mabille, Le Nat. ii. p. 100, Madagascar.

Alypia aguirrei, sp. n., Berg, An. Soc. Arg. xiii. p. 174, Buenos Aires.

Metagarista hilzingeri, sp. n., id. *l. c.* p. 176 (and larva, p. 277), Buenos Aires.

Chalcosiidæ.

Moore (Lep. Ceyl. ii.) redescribes and figures *Trypanophora taprobanes*, Walk., pl. xcv. figs. 8 & 8*a*, p. 40, *Sephisa cingala*, Moore, fig. 1, p. 41, *Scaptesyle bicolor*, Walk. (= *Dichromia nietneri*, Feld.), fig. 2, p. 42, *Heteropan scintillans*, Walk., fig. 3, pl. xcvi. p. 43, *Cyclosia panthona*, Cram., pl. xcvii. figs. 1, 1*a*, & 1*b*, *Chalcosia pretiosa*, Walk., fig. 4, p. 44, pl. xcvi., *venosa*, Walk., pl. xcvii. figs. 2 & 2*a*, *affinis*, Guér., fig. 2, p. 45, and *Amesia midaina*, Herr.-Schäff., figs. 1 & 1*a*, pl. xcviii. p. 46.

Campylotes atkinsoni, Moore, figured by Waterhouse, Aid, ii. pl. cxii.

Callhistia, g. n., Druce, P. Z. S. 1882, p. 779. Allied to *Gynautocera* and *Histia*; type, *C. grandis*, sp. n., *l. c.* pl. lx. fig. 5, New Guinea.

Hypsoides, g. n., Butler, Cist. Ent. iii. p. 1. *Chalcosiidæ* (?), but with

a superficial resemblance to *Hypsa*; type, *H. bipars*, sp. n., *l. c.* p. 2, Madagascar.

Chalcosia quadrifasciata, pl. xcvi. fig. 5, and *similata*, pl. xcvii. figs. 3 & 3*a*, Moore, Lep. Ceyl. ii. p. 45, Ceylon, spp. nn.

Epyrgis forbesi, Druce, P. Z. S. 1882, p. 779, pl. lx. fig. 6, Java; *E. binghami*, Butler, Ann. N. H. (5) x. p. 374, Tenasserim: spp. nn.

Histia comearis, Butler, *ibid.*, Tenasserim.

Milionia pyrozonis, id. *l. c.*, p. 375, Tenasserim; *M. butleri*, Druce, *l. c.* p. 781, pl. lxi. fig. 4, Sumatra: spp. nn.

Zygænidæ.

Moore (Lep. Ceyl. ii.) redescribes and figures: *Syntomis georgina*, Butl., fig. 2, p. 34, *cysseoides*, fig. 1, pl xcv., *artina*, Butl., fig. 4, *passalis*, Fabr. (= *creusa*, Cram., *nec* Linn., which = *Euchromia irus*, Cram.), and *latreillii*, Boisd., p. 35, *montana*, Butl., fig. 5, pl. xciv., *Eressa confinis*, Walk., fig. 6, *subaurata*, Walk., fig. 4, p. 36, and *Procotes diminuta*, Walk., fig. 3, p. 37, *Callizygæna nivimacula*, Feld., fig. 5, *Phacusa thoracica*, Moore, fig. 7, pl. xcv., and *Euchromia polymnia*, Linn., pl. xciv. figs. 6 & 6*a*, p. 39.

Zygæna trifolii, *loniceræ*, *hippocrepides*, and *filipendulæ*: varieties discussed: Selys-Longchamps, CR. Ent. Belg. xxvi. pp. cxiii.-cxvi. *Z. hippocrepidis* noticed; Lallemand, *tom. cit.* p. c. *Z. filipendulæ*: varieties noticed; Nowers, Ent. xv. p. 39, and Barrett & Briggs, Ent. M. M. xix. pp. 21, 22, 43, & 90.

Procris: notes on the three British species; J. J. Weir, Ent. xv. pp. 188–190. *P. melas*, Guér.: habits noticed; Edmonds, Tr. E. Soc. 1882, p. 4.

Ino notata, Zell., var. (?) from Tian Shan described; Alphéraky, Hor. Ent. Ross. xvii. p. 23.

Syntomis phegea. Aberration; Ragusa, Nat. Sicil. i. pp. 278 & 279, pl. xi. fig. 6.

Glaucopis omphale and *chalciope*, Hübn. Cocoons described and figured; Dewitz, Verh. L.-C. Ak. xliv. p. 251, pl. viii. figs. 4 & 5.

Zygæna ecki, sp. n., Christoph, Hor. Ent. Ross. xvii. p. 123, Shahku.

Syntomis butleri and *quinquemacula*, spp. nn., Mabille, Le Nat. ii. p. 134, Madagascar.

Hydrusa kefersteini, sp. n., Butler, Cist. Ent. iii. p. 2, Madagascar.

Arctiidæ.

Moore (Lep. Ceyl. ii.) redescribes and figures *Alope ricini*, Fabr. (= *ocellifera*, Walk.), pl. cvi. figs. 2 & 2*a–c*, p. 70, *Spilarctia subfascia*, Walk., figs. 3 & 3*a*, p. 71, and *Pangora erosa*, Walk., figs. 1, 1*a*, & *b*, pl. cvii. p. 72.

Charidea cimicoides, Herr.-Schäff.: cocoon described and figured; Dewitz, Verh. L.-C. Ak. xliv. p. 252, pl. viii. figs. 14 & 14*a*. *C. nivea*, Herr.-Schäff., = *Euspeudosoma involutum*, Sepp, and *C. neglecta*, Burm., = *Ctenucha opaca*, Boisd.; Berg, An. Soc. Arg. xiii. pp. 178 & 179.

Arctia maculosa, Gern., var. *mannerheimi*, Dup., and *glaphyra*, Ev.,

var. *manni*, pl. i. fig. 32, noticed from Kulja; Alphéraky, Hor. Ent. Ross. xvii. pp. 28 & 29. *A. achaia*, Grote & Rob.: its enormous variation described, with remarks on the variation of other American *Arctiidæ*; Stretch, Papilio, ii. pp. 90–92. *A. caia*: varieties reared from larvæ fed on strawberry and *Aconitum napellus*; Bieger & Gauchler, Ent. Nachr. viii. pp. 245 & 275. On rearing: Cambridge, Ent. xv. pp. 283 & 284. *A. dione*, Fabr.: on rearing; Gilbert, Papilio, ii. p. 50. *A. nais*, Drury: transformations described; French, *tom. cit.* pp. 176–179.

Chelonia costata, Boisd., = *fulvia*, Don.; Butler, Ann. N. H. (5) x. p. 159.

Callarctia ornata, Pack., = *achaia*, Grote & Rob.; Stretch, Papilio, ii. p. 147.

Pyrrharctia isabella. Early stages of larva, and variety of imago noticed; N. Coleman, Papilio, ii. p. 18.

Seirarctia clio, Pack.: transformations noticed; Behr, Papilio, ii. p. 187.

Spilosoma lubricipeda and var. *zatima*: on rearing; Thiele, B. E. Z. xxvi. p. 390. *S. turensis*, Ersch., ab. from Kulja noticed; Alphéraky, *l. c.* p. 32.

Euchætes: table of N. American species; Grote, Canad. Ent. xiv. pp. 196 & 197. *E. spraguei* and *abdominalis*, Grote (*cf.* also *id.* Canad. Ent. xiv. p. 20), and *eglenensis*, Clem., differentiated; Grote, Papilio, ii. pp. 110 & 111.

Euchelia jacobææ. Yellow form noticed; Pearce, Ent. xv. p. 161.

Callimorpha hera. Aberration; Kempuy, Wien. ent. Z. i. p. 62.

Ecpantheria scribonia, Stoll, popularly described and figured with larva; W. Saunders, Canad. Ent. xiv. pp. 113–115, figs. 12 & 13.

Gnophala hopfferi, Grote. Larva noticed; [Ld.] Walsingham, Papilio, ii. pp. 82 & 83.

Callicercon, g. n., Butler, Cist. Ent. iii. p. 2. Allied to *Eucereon*, but less robust, and discoidal cell of hind wings shorter; type, *C. affine*, sp. n., *l. c.* p. 3, Madagascar.

New species:—

Trichosoma breveti, Oberthür, Bull. Soc. Ent. Fr. (6) ii. p. clxxiv. Algeria.

Daphænura minuscula, Butler, Cist. Ent. iii. p. 3, Madagascar.

Arctia erschoffii, Alphéraky, Hor. Ent. Ross. xvii. p. 29, pl. i. fig. 33, Tian-Shan.

Hypercompa thelwalli, Druce, P. Z. S. 1882, p. 779, pl. lxi. fig. 1, Nyassa.

Callimorpha kolpakofskii, Alphéraky, *l. c.* p. 26, pl. i. fig. 31, Kulja.

Areas hyporhoda, Butler, Ann. N. H. (5) x. p. 159, New Britain and Duke of York Island.

Euchætes madagascariensis, id. Cist. Ent. iii. p. 3, Madagascar, *inopinatus*, Florida, p. 13, and *pudens*, Texas, p. 126; H. Edwards, Papilio, ii. *E. zonalis* and *perlevis*, Arizona, and *vivida*, Texas, Grote, Papilio, ii. p. 131.

Spilarctia turbida, Butler, Ann. N. H. (5) x. p. 158, Duke of York Island.

Paracles rudis, id. Tr. E. Soc. 1882, p. 5, Chili.

Laora latior, p. 5, *tegulata*, *angustior*, p. 6, and *obscura*, p. 7, Butler, *l. c.*, Valparaiso.

Spilosoma alcumena, Berg, An. Soc. Arg. xiii. p. 213, Argentine Republic, Brazil.

Euhalesidota pura, Neumoegen, Papilio, ii. p. 133, Arizona.

Halesidota mixta, id. *l. c.*, Arizona; *H. sertata*, p. 214, *infucata* and *mundula*, p. 216, Berg, *l. c.*, Argentine Republic.

Rajendra irregularis, Moore, Lep. Ceyl. ii. p. 72, pl. cvii. fig. 2, Ceylon.

Lithosiidæ.

Moore (Lep. Ceyl. ii.) redescribes and figures *Œonistis entella*, Cram., fig. 2, p. 35, *Brunia antica*, Walk., fig. 3, *Katha brevipennis*, Walk., fig. 4, p. 56, *Capissa fasciata*, Moore, fig. 2, *Dolgoma obliterans*, Feld., p. 57, *Tegulata basistriga*, fig. 3, *Gampola fasciata*, figs. 4 & 4*a*, pl. cii. p. 58, *Bizone puella*, Dru., figs. 3 & 3*a*, *subornata*, fig. 4, p. 60, *Barsine cuneo-notatus*, Walk., fig. 10, p. 62, *ila*, Moore, fig. 6, *semifascia*, Walk., fig. 7, p. 63, *Setina solita*, Walk., fig. 8, *punctilinea*, Moore, fig. 9, pl. ciii., *Æmene taprobanis*, Walk. (= *Panasa cingalesa*, Walk., and *Autoceras grammophora*, Feld.), fig. 2, p. 64, *guttulosana*, Walk., fig. 3, *sordida*, Butl., fig. 4, p. 65, *Nepita conferta*, Walk. (= *signata*, Walk.), figs. 7 & 7*a-d*, p. 66, *Utetheisa pulchella*, Linn., fig. 5, pl. civ. p. 67, *Argina cribraria*, Clerck (= *astrea*, Drn., *pylotis*, Fabr., *guttata*, Ramb., and *notata*, Butl.), pl. cvi. figs. 1 & 1*a*, p. 68, *syringæ*, Cram. (= *crotalaria*, Fabr.), figs. 2 & 2*a-c*, and *argus*, Koll., figs. 1 & 1*a-c*, pl. cv. p. 69.

Lycomorpha pholus, Drury. Larva and pupa described; Packard, Papilio, ii. p. 181.

Eudule aurora, Burm., = *invaria*, Walk.; *E. limbata*, Burm.: amended description; Berg, An. Soc. Arg. xiii. pp. 179 & 180.

Upenora, Burm., = *Nephodia*, Hübn.; *id. l. c.* p. 181.

Setina aurita, Esp., var. *sagittata* (Rätzer), from the Simplon noticed; Frey, MT. schw. ent. Ges. vi. p 356. *S. micans*, Brem. & Grey, noticed; Butler, Ann. N. H. (5) ix. p. 20.

Hypocrita flaviceps, Burm., is a Pyralid of the genus *Eurypta*, Led.; Berg, *l. c.* pp. 183 & 184.

New genera and species :—

Progona, Berg, An. Soc. Arg. xiii. p. 182. Allied to *Œonistis*; type, *Cydosia luridipennis*, Burm.

Homopsyche, Butler, Ann. N. H. (5) x. p. 226. Allied to *Barsinella*; type, *H. nudarioides*, sp. n., *l. c.*, New Britain.

Padenia, Moore, Lep. Ceyl. ii. p. 58. Placed after *Gampola*; type, *Cyllene transversa*, Walk. (= *Lithosia bifasciata*, Feld.), redescribed and figured, *l. c.* p. 59, pl. ciii. fig. 1.

Garudinia, id. *l. c.* p. 59. Allied to last; type, *Tospitis latana*, Walk., redescribed and figured, *l. c.* p. 59, pl. ciii. fig. 2.

Adites, id. *l. c.* p. 61. Placed after *Bizone*; type, *Doliche hilaris*, Walk, redescribed and figured, *l. c.* pl. civ. fig. 6.

Clerckia, Aurivillius, Sv. Ak. Handl. xix. 5, p. 158. Affinities not stated; type, *Phalana fulvia*, Linn. (neuration, fig. 3).

Hypoprepia inculta, H. Edwards, Papilio, ii. p. 13, Arizona.

Pallene (?) *metalligera*, Butler, Ann. N. H. (5) x. p. 226, New Britain.

Lyclene arcuata, Moore, Lep. Ceyl. ii. p. 62, pl. ciii. fig. 5, Ceylon.

Lycomorpha rata and *latercula*, H. Edwards, Papilio, ii. p. 124, Arizona.

Bizone saalmuelleri, Butler, Cist. Ent. iii. p. 3, Madagascar.

Coracia plumicornis, id. *l. c.* p. 4, Madagascar.

Lithosia rubratra, Tepper, Tr. R. Soc. S. Austr. v. p. 30, S. Australia.

Sozuza punctistriata, p. 4, *mabillii*, *albicans*, *sordida*, p. 5, and *aspersa*, p. 6, Butler, *l. c.* Madagascar.

Prabhasa carnea, *ardens*, p. 6, *nigro-sparsa*, *flexistriata*, p. 7, *fasciata*, *angustata*, and *insignis*, p. 8, *id. l. c.*, Madagascar.

Lyscesia parvula, id. *l. c.* p. 9, Madagascar.

Eugoa marmorea and *placida*, id. *l. c.* pp. 9 & 10, Madagascar.

Nola inconspicua, Alphéraky, Hor. Ent. Ross. xvii. p. 24, pl. i. fig. 30, Kulja; *N. cingalesa*, Moore, *l. c.* p. 66, pl. civ. fig. 1, Ceylon; *N. bryophiloides*, Butler, *l. c.* p. 10, Madagascar; *N. sorghiella*, Riley, Rep. Ins. 1882, p. 188, pl. xi. fig. 1, Florida.

Hypsidæ.

Moore (Lep. Ceyl. ii.) redescribes and figures *Hypsa persecta*, Butler, pl. c. figs. 1 & 1*a*, p. 51; *Damalis alciphron*, Cram., pl. cii. figs. 1, 1*a* & *b*, *producta*, Butl., pl. ci. figs. 1 & 1*a*, p. 52; *Lacides ficus*, fig. 2, p. 93; *Migoplastis ceylonica*, Feld (= *correcta*, Walk., fig. 5; *Digama insulana*, Feld., fig. 3, p. 54, and *fasciata*, Butl., fig. 4, pl. c. p. 55.

Hypsa heliconia, Linn., noticed and figured; Aurivillius, Sv. Ak. Handl. xix. 5, pp. 158 & 159, pl. i. fig. 5.

Noctua versicolor, Don. (*nec* Fabr.), =*Hypsa eusemioides*, Feld.; Butler, Ann. N. H. (5) ix. p. 159.

Damalis tigrina, sp. n., *id. op. cit.* x. p. 160, New Britain.

Bocirazа goldiei and *separata*, spp. nn., Druce, P. Z. S. 1882, p. 781, pl. lxi. figs. 5 & 6, New Guinea.

Nycteolidæ.

Sarrothripa undulana, Hübn.: aberration from Kulja briefly described; Erschoff & Alphéraky, Hor. Ent. Ross. xvii. p. 24.

Nyctemeridæ.

Moore (Lep. Ceyl. ii.) redescribes and figures *Nyctemera lacticinia*, figs. 1 & 1*a*, p. 47, *lutistriga*, fig. 2, pl. xcix., *nigrovenosa*, Moore, figs. 4 & 4*a*; *Dondera alba*, Moore, fig. 3, pl. xcviii. p. 48; and *Curoba sangarida*, Cram. (= *mopsa*, Dru.), and *fasciata*, Walk., pl. xcix. figs. 3 & 3*a*, p. 49.

Dilemera pellex, Linn. (= *Leptosoma artemis*, Boisd.), noticed and figured; Aurivillius, Sv. Ak. Handl. xix. 5, p. 161, pl. i. fig. 5.

Nyctemera acraina, Calabar, and *chromis*, pl. lxi. fig. 2, West Africa; Druce, P. Z. S. 1882, p. 780, spp. nn.

Leptosoma mabillii, sp. n. (= *Nyctemera biformis*, Mab., ♀ *nec* ♂). Butler, Ent. M. M. xix. p. 57, Antananarivo.

Hylemera candida and *nivea*, spp. nn., *id. l. c.* p. 58, Betsileo; *H. fadella*, Mabille, Le Nat. ii. p. 100, Madagascar: spp. nn.

Otroeda varunæa, Druce, P. Z. S. 1882, p. 780, Congo.

Callidulidæ.

Cleosiris catamita, Geyer, redescribed and figured; Moore, Lep. Ceyl. ii. p. 50, pl. xcix. figs. 4 & 4*a*.

Liparidæ.

Damage caused to osiers by larvæ of *Liparis salicis*, *L. dispar*, and *Bombyx neustria*; Girard, Bull. Soc. Ent. Fr. (6) ii. pp. cv. & cvi.

Orgyia, sp. injurious to *Eucalyptus tereticornis* in Gippsland; Macleay, P. Linn. Soc. N. S. W. vi. p. 845. *O. flavo-limbata*, Staud., noticed and figured with cocoon; Alphéraky, Hor. Ent. Ross. xvii. p. 35, pl. i. fig. 35. *O. leucostigma*: notes on rearing, variation of larvæ, &c.: it may not be distinct from *antiqua*; Coleman, Papilio, ii. pp. 164–166.

Laria rossi, Curt.: transformations; Scudder, Bull. U. S. Nat. Mus. xv. (1879) pp. 159 & 160.

Porthesia producta, Walk., noticed; Butler, Cist. Ent. iii. p. 11, note.

Porthetria hypoleuca, Phil., ♂ described; *id.* Tr. E. Soc. 1882, p. 7.

Ocneria dispar noticed; Gauchler, Ent. Nachr. viii. p. 274.

Mardara viola, Butl., belongs to *Calliteara*; Butler, Cist. Ent. iii. p. 14, note.

Pachycispia, g. n., Butler, Cist. Ent. iii. p. 11. Allied to *Cispia*; fore-wings more pointed, hind-wings narrower. Type, *P. picta*, sp. n., *l. c.* p. 12, Madagascar.

New species:—

Parorgyia phasiana and *maligna*, Butler, Cist. Ent. iii. p. 17, Madagascar.

Ocneria komarovi, Christoph, Hor. Ent. Ross. xvii. p. 109, Russian Armenia.

Aroa immaculata, Butler, Ann. N. H. (5) x. p. 227, Duke of York Island.

Artaxa fulva, id. *l. c.* p. 227, Duke of York Island; *A. incommoda*, id., Cist. Ent. iii. p. 11, Madagascar; *A.* (?) *ingenita*, H. Edwards, Papilio, ii. p. 12, Arizona.

Porthesia melanosoma, Melbourne, and *mixta*, Tasmania; Butler, Ann. N. H. (5) ix. pp. 87 & 88.

Charrotriche limonea, id. Cist. Ent. iii. p. 11, Madagascar.

Lymantria dulcinea, id. *l. c.* p. 12, Madagascar.

Calliteara elegans, p. 13, *grandidieri*, *mœrens*, p. 14, *pastor*, p. 15, and *prasina*, p. 16, *id. l. c.*, Madagascar.

Dasychira pumila and *pallida*, id. *l. c.* pp. 16 & 17, Madagascar.
Liparis nolana, Mabille, Le Nat. ii. p. 134, Madagascar.
Darala stygiana, Butler, Ann. N. H. (5) ix. p. 88, Melbourne.
Teia pusilla (= *anartoides*, var. *β*, Walk.), *id. ibid.*, Melbourne.

Psychidæ.

Metura elongata, Saund. (figs. 1-6), and *Entometa ignobilis*, Walk. (figs. 7-10): transformations described and figured; *E. despecta*, Walk., is not one of the *Psychidæ*; McCoy, Prodr. Zool. Viet., Dec. iv. pl. xl. [1879].

Psyche heylaertsi, Mill., noticed; Failla-Tedaldi, Nat. Sicil. i. (Cenni Bibl.) p. 38.

Fumea intermediella, Bruand: parthenogenesis; Höfner, JB. Mus. Kärnten, xv. pp. 199 & 200. *F. rouasti*, Heyl., noticed and figured; Alphéraky, Hor. Ent. Ross. xvii. p. 34, pl. ii. fig. 41.

Œceticus, sp.: cocoons from Montevideo noticed; André & Poujade, Bull. Soc. Ent. Fr. (6) ii. pp. cxxxv. & clv. *Œ. kirbii*, Guild. (= *poeyi*, [illegible], = *fulgurator*, Herr.-Schäff., = *gigantea*, Zell.), noticed; Berg, An. [illegible]c. Arg. xiv. pp. 275 & 276.

Perophora packardi, Grote, and two undetermined species: larva-cases described and figured; Dewitz, Verh. L.-C. Ak. xliv. pp. 253–255, pl. viii. figs. 1, 1A, 7, 8 & 8A.

New genera and species:—

Acousmaticus, Butler, Tr. E. Soc. 1882, p. 8. Aspect of *Psyche*, but antennæ formed as in *Penthophera*; type, *A. magnicornis*, sp. n., *ibid.*, Chili.

Thanatopsyche, id. *l. c.* p. 9. Aspect and coloration of *Thyridopteryx*, but differing in neuration; type, *T. canescens*, sp. n., *l. c.* pl. i. figs. 4 & 4*a*, Chili. (*Psyche chilensis*, Phil., is congeneric.)

Pseudopsyche, H. Edwards, Papilio, ii. p. 124. *Psychidæ* (?), type, *P. exigua*, sp. n., *l. c.* p. 125, Arizona.

Psyche wockii, Standfuss, Ent. Nachr. viii. p. 322, Italy.

Acanthopsyche tedaldii, Heylaerts, CR. Ent. Belg. xxvi. p. cxxxix., Sicily, Syria, Algeria.

Fumea norvegica, id. *l. c.* p. cxl., Norway, Alpes-Maritimes.

Œceticus westwoodi, Berg, An. Soc. Arg. xiii. p. 217, Corrientes; *Œ. platensis* (= *kirbii*, Berg & Burm., *nec* auct. al.), *id. l. c.* xiv. p. 276, Argentine Republic, Uruguay.

Eumeta maxima, Butler, Ann. N. H. (5) x. p. 228, Duke of York Island.

Notodontidæ.

Dimmock, A. K. Asymmetry of the Nervous System in the Larva of *Harpyia vinula*. Psyche, iii. pp. 340 & 341.

The nervous system, instead of extending in a direct line in the ventral region of the larva, as usual in insect larvæ, curves laterally outward

Dasychira pumila and *pallida*, id. *l. c.* pp. 16 & 17, Madagascar.
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Psyche wockii, Standfuss, Ent. Nachr. viii. p. 322, Italy.

Acanthopsyche tedaldii, Heylaerts, CR. Ent. Belg. xxvi. p. cxxxix., Sicily, Syria, Algeria.

Fumea norvegica, id. *l. c.* p. cxl., Norway, Alpes-Maritimes.

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The nervous system, instead of extending in a direct line in the ventral region of the larva, as usual in insect larvæ, curves laterally outward

between the first and second thoracic ganglia to avoid interference with the duct from a gland which opens out between these ganglia, and which secretes a defensive fluid. A similar peculiarity exists in the common leech (*Hirudo medicinalis*).

Notodonta concinna: transformations described and figured; Saunders, Rep. E. Soc. Ont. 1881, pp. 20 & 21, figs. 5–7. *N. dictæa*: effect of heat on larvæ and pupæ; Dobson, Ent. xv. pp. 66 & 67: double-brooded; Mathew, Ent. M. M. xviii. p. 211. *N. stragula*, Grote: larva described by him; Papilio, ii. p. 99.

Pheosia rimosa, Pack.: larva and pupa described; Goodhue, Canad. Ent. xiv. pp. 73 & 74.

Stauropus fagi: a fore-leg lost in the larva was also deficient in the imago; Brabandt & Krancher, Psyche, iii. pp. 363 & 364: larva on apple; Anderson, Ent. xv. p. 89.

Bombyx pityocampa: if a column of larvæ is interfered with or broken, it immediately stops; Pouchet, Mém. Soc. Biol. (7) ii. pp. 131 & 132.

New genera and species:—

Pseudocerura, Butler, Tr. E. Soc. 1882, p. 105. Allied to *Heterocampa*, but with the aspect of *Cerura*; type, *P. thoracica*, sp. n., *l. c.* p. 106, Chili.

Edmondsia, id. *l. c.* p. 106. Allied to *Lophopteryx*, but with broader wings; type, *E. sypnoides*, sp. n., *l. c.* p. 107 (larva figured), Chili.

Zelomera, id. Cist. Ent. iii. p. 25. Allied to *Notodonta*; antennæ only pectinated to the middle; inner margin of fore-wings with no projecting tooth, but angulated near the base; discoidal cells of all the wings short. Type, *Z. imitans*, sp. n., *l. c.* p. 26, Madagascar.

Harpyia petri and *przewalskii*, Alphéraky, Hor. Ent. Ross. xvii. pp. 37 & 38, pl. i. figs. 36 & 37, Kulja.

Cnethocampa grisea, Neumoegen, Papilio, ii. p. 134, Arizona.

Ichthyura inornata, id. *ibid.*, Arizona; *I. strigosa*, Grote, Bull. U. S. Geol. Surv. vi. p. 582, Maine; *I. palla*, French, Canad. Ent. xiv. p. 33, Illinois.

Drymonia pica, Butler, Tr. E. Soc. 1882, p. 22, Chili.

Phanaca (?) *cossoides*, id. Ann. N. H. (5) x. p. 229, Duke of York Island and New Britain.

Œdemasia perangulata, H. Edwards, Papilio, ii. p. 125, Colorado.

Megalopygidæ.

Megalopygidæ, Herr.-Schäff., recharacterized by Berg, An. Soc. Arg. xiii. pp. 262–264. He regards it as intermediate between the *Liparidæ*, *Cossidæ*, *Limacodidæ*, *Bombycidæ*, and *Notodontidæ*, and refers to it the genera *Megalopyge*, Hübn., *Alpis*, *Podalia*, Walk., *Chrysopyge*, Herr.-Schäff., *Lagon*, Harr., *Pimela*, Clem., *Ochrosoma*, Herr.-Schäff., and *Carama*, Walk. The genera *Melanopyga*, *Ochrosoma*, and *Carama* are fully recharacterized, and a list of their species added (pp. 264–277), the following being the most important synonymy indicated: *M. orsilochus*, Cram. (= *Podalia vesta*, Walk.), *M. lanata*, Cram. (= *lanifera*, Hübn.,

citri, Sepp), *M. undulata*, Burm., var. *vulpina*, Berg, *opercularis*, Abb. & Sm. (= *crispata*, Pack.).

Megalopyge albicollis, Walk. (? = *Podalia fuscescens*, var. ♀, Walk., ? = *M. walkeri*, Berg), noticed; id. *l. c.* pp. 277 & 278.

Carama discrepans, Wallengr. (= *sparshalli*, Walk., *nec* Curt., = *walkeri*, Butl.), noticed; *id. l. c.* pp. 278 & 279.

Carama pruinosa, sp. n., *id. l. c.* p. 276, Buenos Aires, Brazil.

Megalopyge urens, Brazil, Venezuela, Uruguay, p. 268, *uruguayensis*, Uruguay, p. 270, *walkeri* (= *fuscescens*, var. ?, Walk.), Brazil, p. 271, *id. l. c.*, spp. nn.

Limacodidæ.

Heterogenea argentiflua, Hübn. Transformations described; Dewitz, Verh. L. C. Ak. xliv. pp. 252 & 253.

Doratifera chrysochroa, Feld. Cocoon described and figured; *id. l. c.* p. 258, pl. viii. fig. 3.

Adoneta spinuloides, Herr.-Schäff. Larva described; Ballard, Papilio, ii. p. 83.

[redacted]k. Neuration described; Berg, An. Soc. Arg. xiii. pp. 258 & 259.

Macrosemyra, g. n., Butler, Cist. Ent. iii. p. 25. Differs from *Semyra* and *Miresa* in the antennæ of the ♂ being simply thickened and not pectinated; type, *M. tenebrosa*, sp. n., *l. c.*, Madagascar.

Limacodes rude[*-dis*], Maryland, and *trigona*, Arizona, H. Edwards, Papilio, ii. p. 12, spp. nn.

Drepanulidæ.

Drepana sicula: variation; Barrett, Ent. M. M. xviii. p. 233. *D. raffiesi*, Moore, is a *Geometra*, and = *Tanaorrhinus luteo-viridata*; Butler, Cist. Ent. iii. p. 25, note.

Saturniidæ.

Dimmock, G. Organs, probably defensive, in the larva of *Hyperchiria varia*, Walk. (*Saturnia io*, Harr.). Psyche, iii. pp. 352 & 353.

These are protrusile organs situated on each side a little behind and below the stigmata of the fourth and tenth segments (not counting the head) respectively. The organ is probably the opening of a gland, although it never appears moist.

Silks and Silkworms (a general article, forming a review of Wardle's "Wild Silks of India;" Slater, J. Sci. (3) iv. pp. 81–88. [*Cf.* also Odell, Nature, xxv. pp. 563 & 564.]

On the production of wild silks in India; Royle, J. Soc. Arts, xxx. pp. 823–826.

Notes on silk-producing *Bombyces* (*Saturniidæ*) reared in 1881; Wailly, J. Soc. Arts, xxx. pp. 447–450, 544–546, & 870, and Bull. Soc. Acclim. (2) ix. pp. 249–272 & 576–578.

Caterpillar mimicking a shrew in Assam ; Peal, Nature, xxvi. p. 368, woodcuts. [Appears from the figures to be one of the *Saturniidæ*.]

Hours of the day at which N. American *Saturniidæ* emerge from the pupa ; Neumoegen & Brodie, Papilio, ii. pp. 18 & 83.

Antheræa macrophthalma, W. F. Kirby, *Attacus andromeda*, Phil., figured by Waterhouse ; Aid, i. pl. lxxxviii. & cxix. fig. 1.

Attacus hesperus, Linn. (= *splendidus*, Beauv.), noticed and figured ; Aurivillius, Sv. Ak. Handl. xix. 5, pp. 145 & 146, fig. 1. *A. felderi*, Boisd., and *trifenestratus*, Helf. : cocoons noticed ; Girard, Bull. Soc. Ent. Fr. (6) ii. pp. clxi.–clxiii. (the former = *frithi*, Moore ; Fallou, *tom. cit.* pp. clxvii. & clxviii.). *A. pernii* : specimens with deeply-notched wings ; Girard, Bull. Soc. Acclim. (2) ix. pp. 653–657, figs. 1–4. On rearing ; Buin & Clément, *tom. cit.* pp. 44–48, 84, & 85. *A. yamamai* : on preserving the eggs by cold : Buin, *op. cit.* ix. pp. 49–51.

Platysamia, Grote : Grote defends the use of this name in preference to *Samia*, Hübn. ; Canad. Ent. xiv. pp. 213 & 214. *P. cecropia* : list of food plants ; Brodie, Papilio, ii. pp. 32 & 33. On rearing ; Fallou, Bull. Soc. Acclim. (2) ix. pp. 137–141. Motion of wings in drying ; Grote, Papilio, ii. p. 83.

Samia columbia : food-plants ; Brodie, *l. c.* pp. 79 & 80. [illegible] and *cecropia* : note on cocoons ; Cook & others, Canad. Ent. xiv. p. 177.

Telea polyphemus. Transformations popularly described and figured ; W. Saunders, Canad. Ent. xiv. pp. 41–45, figs. 4–9. Food-plants ; Brodie, *l. c.* pp. 58–60.

Antheræa paphia, Linn., noticed and figured ; Aurivillius, *l. c.* pp. 147 & 148, fig. 2. *A. eucalypti*, Scott (?) : transformations noticed ; Guest, Tr. R. Soc. S. Austr. v. pp. 95 & 96. *A. pernii* and *roylii* : hybrids described ; W. F. Kirby, P. E. Soc. 1881, pp. vii. & viii. *A. mylitta* and *yamamai* : hybrids noticed ; Wood, J. Soc. Arts, xxx. pp. 349–434.

Actias luna. Expansion of wings after emerging from the pupa ; Moffat, Canad. Ent. xiv. pp. 98 & 99.

Saturnia carpini : retarded development ; M'Rae, Ent. xv. pp. 131 & 132. *S. pyri* : sound produced by the larva ; Krancher, Pysche, iii. p. 363.

Cercophora frauenfeldi, Feld. Larva described and figured ; Butler & Edmonds, Tr. E. Soc. 1882, pp. 17, 18, & 103, pl. i. fig. 5.

Eudelia venusta, Walk., *Bombyx* (?) *aristoteliæ*, and *Eudelia rufescens*, Phil., are synonymous ; Butler, *l. c.* p. 18. Larva and cocoon described ; Edmonds, *l. c.* pp. 103 & 104.

Polythysana rubrescens, Blanch., and *albescens* (? = *cinerascens*, Feld.). Habits ; Edmonds, *l. c.* pp. 19 & 20. Larva and pupa of the last described ; *id. l. c.* pp. 104 & 105.

Hyperchiria confluens, Phil., var. *olivacea* from Valparaiso, and *H. erythrops*, Blanch., noticed ; Butler, *l. c.* pp. 20–22. Larva of *H. erythrops* described ; Edmonds, *l. c.* p. 105.

Euleucophæus, Pack., is not generically distinct from *Hemileuca* ; Grote, Canad. Ent. xiv. pp. 214 & 215.

Argyravges, g. n., Grote, Canad. Ent. xiv. p. 215. Allied to *Hemileuca* ; type, *H. neumoegeni*, H. Edw.

New species :—

Eunæa plumicornis, Butler, Cist. Ent. iii. p. 18, Madagascar.

Ceranchia reticolens and *cribrelli*, id. *l. c.* pp. 19 & 20, Madagascar.

Copaxa vulpina, id. *l. c.* p. 20, Madagascar.

Syntherata godeffroyi, id. Ann. N. H. (5) x. p. 227, New Britain.

Eudelia vulpes, id. Tr. E. Soc. 1882, p. 18, Chili.

Polythysana edmondsi, id. *l. c.* p. 19, Waterhouse, Aid, i. pl. cxix. fig. 2, Valparaiso.

Hyperchiria acharon, and var. *debilis*, Butler, *l. c.* p. 21, Chili; *H. zephyria*, Grote, Canad. Ent. xiv. p. 215, New Mexico; *H. pamina*, and var. *aurosca*, Neumoegen, Papilio, ii. p. 60, Arizona.

Mimallo cordubensis, Berg, An. Soc. Arg. xiv. p. 279, Cordova.

Ceratocampidæ.

Ceratocampa imperialis: transformations described; Waflly & Kirby, J. Soc. Arts, xxx. pp. 545 & 546. *C. regalis* coming to sugar; Bruce, Papilio, ii. p. 188.

Citheronia sepulcralis, Grote, noticed by him as destructive to pine; Bull. U. S. Geol. Surv. vi. p. 589.

Bombycidæ.

Riley, C. V. The Silkworm; being a brief Manual of Instructions for the production of Silk. Department of Agriculture, Special Report, No. 11 (2nd edition). Washington: 1882, 8vo, pp. 37, woodcuts.

Statistics of silk production in France; J. Soc. Arts, xxx. p. 976.

On silk-culture in America; Riley's Rep. Ins. 1882, pp. 67-76.

Bombyx mori. Effect of temperature on larvæ; Ormerod, Ent. xv. pp. 127-129.

Lasiocampidæ.

Catocephala (?) *nigro-signata*, Phil., and *Ormiscodes crinita*, Blanch., figured by Waterhouse, Aid, i. pls. lxxxix. & xcviii.

Streblota, Hübn., recharacterized; Berg, An. Soc. Arg. xiii. pp. 261 & 262.

Gastropacha rubi. Frozen larva reviving; Schilde, Ent. Nachr. viii. p. 47.

Lasiocampa quercifolia: ♀ depositing 580 fertile eggs; Brandt & Krancher, Psyche, iii. pp. 363 & 364. *L. trifolii*: hermaphrodite noticed; Fraser, Ent. M. M. xix. pp. 111 & 112.

Bombyx neustria: hermaphrodite; Buchillot, Feuill. Nat. ii. p. 146; *B. populi*, L.: pupation described; Forel, Kosmos, xii. pp. 207-210, woodcut. The cocoon is prepared of partially digested earth. *B. quercus*, var. *burdigalensis*, from Bordeaux, p. 127, var. *dalmatinus*, from Dalmatia, and var. *fenestratus* [from Leipzig?] p. 128, described; Gerhard, B. E. Z. xxvi. *B. quercus* eating laurel; Wilson, Ent. M. M. xix. p. 165. Varia-

tion caused by feeding on pine-needles; Bieger, Ent. Nachr. viii. pp. 244 & 245.

Macromphalia dedecora, Feisth. (♂ ? = *ancilla*, Phil.), and *chilensis*, Feld.: larvæ noticed; Edmonds, Tr. E. Soc. 1882, p. 11. *M. rubro-grisea* and *rustica*, Phil., are probably sexes: *M. affinis*, Guér., noticed; Butler, *l. c.* pp. 12–14.

Ormiscodes socialis, Feisth. (= *Dirphia angulifera*, Walk.): larva described; Edmonds, *l. c.* p. 14. *O. cinnamomea*, Blanch., = *crinita*, Blanch., and *Dirphia plana*, Walk., = *O. cinnamomea*, Feisth.; Butler, *l. c.* p. 15. *O. crinita*: larva described; Edmonds, *l. c.* pp. 101 & 102.

Catocephala marginata, Phil., and allies noticed; Butler, *l. c.* p. 15.

Clisiocampa neustria noticed; Bethune, Rep. E. Soc. Ont. 1881, pp. 82 & 83.

Dryocampa senatoria destructive to oak; Claypole, Am. Nat. xvi. p. 914.

Anisota senatoria noticed; Clarkson, Papilio, ii. pp. 188 & 189.

Adelocephala bicolor, Harr.: various stages of larva, and var. *immaculata* of imago described; Jewett, Papilio, ii. pp. 38–41, 144 & 145.

New genera and species:—

Cinommata, Butler, Tr. E. Soc. 1882, p. 16. Placed next to *Catocephala*; type, *C. bistrigata*, sp. n., *l. c.*, Chili. Larva described; Edmonds, *l. c.* p. 102.

Rhinaxina, Berg, An. Soc. Arg. xiii. p. 259. Intermediate between *Semyra* and *Surida*; type, *R. quadrata* (? = *Semyra quadrata*, Walk.), sp. n. (?) *l. c.* p. 260, Argentine Republic.

Bombyx acanthophylli, Christoph, Hor. Ent. Ross. xvii. p. 124, Persia.

Lasiocampa leonina, Butler, Cist. Ent. iii. p. 21, Madagascar.

Lebeda cowani, id. *ibid.*, Madagascar.

Eutricha nitens, id. *l. c.* p. 22, Madagascar.

Borocera arenicolens, id. *ibid.*, Madagascar.

Ocha hova, id. *l. c.* p. 23, Madagascar.

Miresa pyrosoma and *gracilis*, id. *l. c.* pp. 23 & 24, Madagascar.

Anzabe micacea, id. *l. c.* p. 24, Madagascar.

Clisiocampa incurva, H. Edwards, Papilio, ii. p. 125, Arizona.

Macromphalia nitida, p. 10, *ricularis*, and *purissima*, p. 12, Butler, Tr. E. Soc. 1882, Chili.

Zeuzeridæ.

Xyleutes cossus. Larva in the earth; Warner, Sci. Goss. xviii. p. 166.

Xystus, Grote, pre-occupied, renamed by him *Prioxystus*; New Check List, pp. 21 & 60.

Endagria, sp. n. from Kulja noticed; Alphéraky, Hor. Ent. Ross. xvii. p. 33.

Zeuzera æsculi, recorded from New Jersey; Doll, Papilio, ii. p. 34. *Z.* (*Eudoxyla*) *eucalypti*, Herr.-Schäff.: transformations described and figured; the larva lives on *Acacia*, not in *Eucalyptus*, and is much relished by the Australians: McCoy, Prodr. Zool. Vict., Dec. iii. pl. xxx. [1879].

Cossula, g. n., Bailey, Papilio, ii. p. 93. Allied to *Cossus*, which the writer considers to be related to the *Tortrices*, rather than to the *Castniidæ*; type, *C. magnifica*, sp. n., *l. c.* p. 94, S. Florida.

Cossus mongolicus, Erschoff, Hor. Ent. Ross. xvii. p. 33, pl. i. fig. 34, Kulja; *C. fulvo-sparsus*, p. 26, *pavidus*, and *senex*, p. 27, Butler, Cist. Ent. iii., Madagascar; *C. mucidus*, H. Edwards, Papilio, ii. p. 126, Arizona; *C. angrezi*, Bailey, Papilio, ii. p. 93, Nevada: spp. nn.

Hypopta henrici, Grote, Papilio, ii. p. 131, Arizona; *H. superba*, p. 222, *correntina*, Corrientes, p. 257, and *mendosensis*, Mendoza, p. 258, Berg, An. Soc. Arg. xiii.: spp. nn.

Zeuzera bubo, sp. n., Butler, Ann. N. H. (5) x. p. 228, New Britain.

Hepialidæ.

Bertkau, P. Ueber den Duft-apparat von *Hepialus hecta*, L. Arch. f. Nat. xlviii. pp. 362–371, pl. xviii. figs. 23–25. [*Cf.* Graber, Biol. Centralbl. ii. pp. 500–502.]

The peculiar structure of the scent-glands on the under-surface of the base of the abdomen, and that of the short, thick, brush-tipped hind legs is fully described. Nothing similar appears to exist in the males of other species of *Hepialus*.

Hepialus hectus: perfume emitted by ♂; Barrett, Ent. M. M. xix. pp. 90 & 91. *H. humuli*: Brandt gives a short account of its anatomy, which is very abnormal; Hor. Ent. Ross. xvi. p. iv.

Charagia, sp. Transformations described; Guest, Tr. R. Soc. S. Austr. v. p. 96.

Dalaca (*Triodia*) *venusta*, Blanch., discussed: Berg, An. Soc. Arg. xiii. pp. 219 & 220. *D. nigricornis*, Walk., = *Hepialus venosus*, Blanch. *D. pallens*, Blanch., also noticed; Butler, Tr. E. Soc. 1882, pp. 25 & 26.

Callipielus, g. n., Butler, Tr. E. Soc. 1882, p. 23, pl. i. fig. 6. Allied to *Charagia* and *Pielus*; type, *C. arenosus*, sp. n., *l. c.* p. 24, Valdivia.

Philanglaus, g. n., *id. l. c.* p. 28. Allied to *Hepialus* (*velleda*) and *Oxycanus*; type, *P. ornatus*, sp. n., *l. c.*, Chili.

Pielus luteicornis, sp. n. (Phil., MS.), Berg, An. Soc. Arg. xiii. p. 218, Patagonia.

Aepytus dimidiatus, sp. n., *id. l. c.* p. 220, Chili.

Dalaca subfervens, p. 25, *violacea*, *marmorata*, p. 26, and *hemileuca*, spp. nn., p. 27, Butler, Tr. E. Soc. 1882, Chili.

Cymatophoridæ.

Cymatophora fluctuosa, Hübn. Transformations described; Wackerzapp, S. E. Z. xliii. pp. 211–213.

Gonophora armata, Moore, figured by Waterhouse, Aid, ii. pl. cxvii.

Habrosyne plagiosa, *sanguinea*, Darjiling, and *armata*, Khasia Hills, spp. nn., Moore, Desc. Ind. Lep. Atk. ii. p. 90.

Risoba basilis, Cherra, Darjiling, *vialis*, pl. iv. fig. 1, p. 91, and *confluens*, Darjiling, p. 92, *id. l. c.*, spp. nn.

Kerala multipunctata, sp. n., *id. l. c.* p. 93, pl. iv. fig. 4, Darjiling.

Noctuidæ.

French, G. H. Synopsis of the *Catocalæ* of Illinois. 1882, 8vo, pp. [illegible], woodcut. [*Cf.* Canad. Ent. xiv. p. 119.]

58 species noticed; also includes instructions for collecting.

Grote, A. R. Notes on Walker's types of North American *Noctuidæ* in the British Museum. Illustrated Essay, pp. 38–47.

The following are the most important notes:—*Acronycta fasciata*, Walk., = *brumosa*, Guén., = *verrilli*, Grote; *A. impressa*, Walk.?, = *brumosa*; *A. mixta*, Walk., = *Agrotis speciosa*, Hübn., = *Polia perquiritata*, Morr.; *Acronycta zirculifera*, Walk., = *Charadra deridens*, Guén.; *Bryophila discevaria*, Walk., = *Parastichtis gentilis*, Grote; *Mythimna* (?) *littora*, Guén., = *Pseudolimacodes niveicostatus*, Grote; *M. decolor*, Walk.,? = *Cosmia infumata*, Grote; *M. contraria*, Walk., = *Mamestra picta*, Harr.; *Leucania diffusa*, Walk., = *harveyi*, Grote, = *albilinea*, Guén.; *L. videns*, Guén., and *Nonagria indigens*, Walk., = *Platysenta atriciliata*, Grote; *Hydræcia salicarum*, Walk., = *Agrotis* (*Pachnobia*) *orilliana*, Grote; *Edena obliqua*, Walk., = *Sphida obliquata*, G. & R.; *Mamestra contenta* and *ordinaria*, Walk., = *Hadena devastatrix*, Brace; *M. unicolor*, Walk., = *Agrotis clandestina*, Harr.; *Condica palpalis*, Walk., = *Hadena confederata*, Grote, ? = *Perigea infelix*, Guén.; *Mamestra binotata*, Walk., = *Hadena curvata*; *M. plagiata*, Walk., = *Agrotis bicarnea*, Guén.; *Xylophasia indocilis*, Walk., = *Hadena remissa*, Hübn.; *Apamea demissa*, Walk., = *Mamestra latea*, Guén.; *Miana atomaria*, Walk., = *Telesilla cinereola*, Guén.; *M. undulifera*, Walk., = *Eustrotia apicosa*, Haw., = *nigritula*, Guén.; *M. vincta*, Walk., = *Oligia chalcedonia*, Hübn.; *Celæna* (?) *irresoluta*, Walk., ? = *O. chalcedonia*; *Perigea mobilis*, Walk., = *xanthioides*, Guén., and *Caradrina multifera*, Walk., = *bidicularia*, Morr.

Smith, J. B. Remarks on the Generic Characters of the *Noctuidæ*. Canad. Ent. xiv. pp. 65–72.

Grote (Illustrated Essay, pp. 48–71) notices and figures the following known species (his own, unless otherwise stated):—*Bombycia semicircularis*, *Thyatira lorata*, *Harrisimemna trisignata*, Walk., *Mastiphanes edelata*, *Eulonche lanceolaria*, *Chytonix sensilis*, *Agrotis perattenta*, *conchis*, *semiclarata*, *clodiana*, *fernaldi*, Morr., *biclavis*, *parentalis*, pl. i. figs. 1–13, *A. specialis*, *vocalis*, *pluralis*, *Polia theodori*, *epichysis*, *Heliophila dia*, *Zosteropoda hirtipes*, *Lithophane querquera*, *viridipallens*, *Calocampa cineritia*, *Gortyna rigida*, *cerina*, pl. ii. figs. 14–25, *Charielea triangulifer*, *pernana*, *Annaphila superba*, H. Edw., *Grotella sexseriata*, *Spragueia funeralis*, *Adonisea pulchripennis*, *Heliosea pictipennis*, *Rhodolipsa volupia*, *Lygranthœcia acutilinea*, *Exyra rolandiana*, *Fala ptychophora*, *Ædophron snowi*, *Scopelosoma grafiana*, pl. iii. figs. 26–38, *Synoidea sabulosa*, H. Edw., *Catocala abbreviatella*, *chelidonia*, *beaniana*, *mira*, *frederici*, and *Strenoloma lunilinea*, pl. iv. figs. 39–45.

Riley replies to Grote's observations on seven *Noctuæ* described in the Missouri Entomological Reports; Papilio, ii. pp. 41–44.

Notes on several genera of N. American *Noctuæ*; Grote, Canad. Ent. xiv. pp. 234–236.

Leucania impuncta, Guén. (= *decolorata*, Blanch.), *Agrotis hypsilon*, Rott. (= *frivola*, Wallengr., = *robusta*, Blanch.), *saucia*, Hübn. (= *angulifer*, Walk., = ? *Spælotis stictica* and ? *punctulata*, Blanch., ? *Agrotis impacta*, Walk., and ? *Noctua æthiops*, Phil.), *gypaetina*, Guén. (= *pseudoplecta*, Snell.), *incivis*, Guén. (= *anteposita*, Guén.), *blanchardi*, Berg (= *lutescens*, Blanch., *nec* Eversm., = ? *deprivata*, Walk.), *hispidula*, Guén. (= *flavicosta*, Wallengr.), *Orthodes ferruginescens*, Blanch., *Peropalpus*, Blanch., = *Palindia*, Guén., *Plusia virgula*, Blanch. (= *certa*, Walk., = *Triphæna signata*, Phil.), *P. nu*, Guén. (= ? *depauperata*, Blanch., = *detrusa* and *fumifera*, Walk.), and *P. biloba*, Steph., noticed; Berg, An. Soc. Arg. xiv. pp. 280–282, 286, & 287.

Grote recharacterizes his genera *Momaphana*, p. 63, *Conservula* and *Euedicardsia*, p. 64, New Check List.

Grote (Canad. Ent. xiv. pp. 74–76) remarks on and recharacterizes the following genera remarkable for the structure of the clypeus and tibiæ:—*Bessula* and *Antoplaga*, Grote, *Pippona*, Harv., *Plagiomimicus*, Grote, *Polenta*, Morr., *Stiria* and *Stibadium*, Grote.

Acronycta and *Cucullia*. Höfner suggests that several of the forms which only differ in the larval state may be simply larval variations, or perhaps alternate forms; JB. Mus. Kärnten, xv. p. 200.

Rhododipsa miniana, figs. 1 & 2, *Gortyna rigida*, figs. 3 & 3*a*, and *Schinia buxea*, fig. 4, Grote, figured by him; Papilio, ii. p. 64, pl. i.

On collecting *Noctuæ* with dried apples, &c.; Mewes, Ent. Tidskr. iii. pp. 196, 214, & 215.

Captures of *Noctuæ* at Centre, New York, in 1881; Hill, Papilio, ii. p. 50.

Acronycta abscondita, Treitschke, noticed; Höfner, *l. c.* p. 194. *A. alni*, odour of larva; Slipper, Ent. xv. p. 132. *A. lepusculina*, Guén.: transformations described, and larva and imago figured; W. Saunders, Canad. Ent. xiv. pp. 221 & 222, figs. 22 & 23. *A. occidentalis*, Grote & Rob.: larva and pupa described; Packard, Papilio, ii. p. 181.

Eulonche oblinata, Abb. & Smith: larva described; Grote, Papilio, ii. p. 99.

Arsilonche albo-venosa, Goetze (= *Ablepharon henrici*, Grote), and *Leucania phragmitidicola*, Guén., and *harveyi*, Grote, differentiated; Smith, Canad. Ent. xiv. pp. 197 & 198.

Simyra albo-venosa, De Geer, and its parasite, *Hepiopelmus leucostigmus*, Grav., noticed; Holmgren, Ent. Tidskr. iii. pp 87–89.

Leucania amnicola, Ramb. (= *congrua*, Herr.-Schäff.), noticed; Von Nolcken, S. E. Z. xliii. pp. 175 & 176. *L. extranea*, Guén.: Hawaiian specimens described; Butler, Tr. E. Soc. 1882, p. 32. *L. impuncta*, Guén., var. *decolorata*, Blanch., noticed; *id. l. c.* pp. 113 & 114. *L. unipunctata*, Haw., discussed; Riley, Rep. Ins. 1882, pp. 89–106, pls. ii. & vi. figs. 1–3. Hibernates in larva state: abundance in 1882; *id.* Am. Nat. xvi. pp. 516 & 1017. Larva destroyed by *Metapodius femoratus*, Fabr.; Howard, *tom. cit.* pp. 597 & 598.

Nonagria inquinata, *enervata*, and *fodiens*, Guén., and *læta*, Morr. Descriptions reprinted; Grote, Papilio, ii. pp. 94 & 95.

Euthisanotia timais, Cram. Larva described and figured; Dewitz, Verh. L.-C. Ak. xliv. pp. 256 & 257, pl. viii. fig. 12.

Euglyphia fastuosa, Guén. Larva described and figured; *id. l. c.* p. [illegible], pl. viii. fig. 13.

Hydræcia nictitans. Transformations described; Buckler, Ent. M. M. xviii. pp. 195–197.

Xylophasia zollikoferi, Freyer. The reputed British specimen proves to be only *X. polyodon*, var.; Mason, P. E. Soc. 1882, p. x.

Callierges sunia, Guén. Cocoon described and figured; Dewitz, *l. c.* pp. 255 & 256, pl. viii. fig. 15.

Laphygma fragiperda, Abb. & Sm., noticed as injurious to rice; Riley, Rep. Ins. 1882, p. 138, pl. vii. figs. 4 & 5.

Oxytripia, Staudinger (type, *orbiculosa*, Esp.), recharacterized by him; S. E. Z. xliii. pp. 38 & 39.

Helotropha, Led., and *Apamea*, Tr. Revised list of N. American species; Grote, Canad. Ent. xiv. p. 171.

Prodenia littoralis, Boisd. (= *retina*, Freyer), discussed; Snellen, Tijdschr. Ent. xxv. pp. 50–53.

Conservula, Grote. Characters discussed by him; *l. c.* pp. 212 & 213.

Charæas graminis, L., var. *megala* from Kulja, noticed and figured; Alphéraky, Hor. Ent. Ross. xvii. p. 64, pl. iii. fig. 55.

Luperina inops, Led., var. from Lepsa noticed; Staudinger, S. E. Z. xliii. p. 40.

Mamestra leineri, Freyer, should probably be formed into a new genus; Snellen, *l. c.* pp. 49 & 50. *M. picta*, Harr.: larva described; Grote, Papilio, ii. p. 99. *M. pisi*, Linn., var. *pallens*, remarkable as resembling the Icelandic form of the species, and *M. chrysozona*, Borkh., var. from Central Asia described; Staudinger, S. E. Z. xliii. p. 35.

Caradrina taraxaci, Hübn., and *alsines*, Brahm, differentiated; Van Leeuwen, Tijdschr. Ent. xxv. pp. cxxxiii. & cxxxiv.

Agrotis. Additions to list of N. American species, and descriptions of *A. spissa*, *Noctua ochrogaster*, and *elimata*, Guén., quoted; Grote, Bull. U. S. Geol. Surv. vi. pp. 565 & 566. Butler gives the following synonymy of Chilian species:—*A. suffusa*, Hübn. (= *robusta*, Blanch.), *A. saucia*, Hübn. (varr. *ambrosioides*, Walk., and *stictica*, Blanch., = *impuncta*, Walk.), *A. hostilis*, Walk. (= *consueta* and *incommoda*, Walk., ? = *infuscata*, Blanch.), *A. bipars*, Walk. (= *A. consueta*, pt. Walk.), *A. bilitura*, Guén. (= *cinerario*, Blanch., = *deprivata*, Walk.), *A. anteposita*, Guén. (= *lutescens*, Blanch., = *decernens*, Walk.); *Luperina americana*, Blanch., is an *Agrotis*; Tr. E. Soc. 1882, pp. 126–128. Species injurious to vine; Fallou, Bull. Soc. Ent. Fr. (6) ii. pp. clxxxvii. & clxxxviii. *A. albifurca*, Ersch. (= *costata*, Staud.), pl. ii. fig. 43, p. 44; *A. signifera*, Fabr., var. *orientis*, p. 54, *A. scripturosa*, Ev., p. 56, *A. rava*, Herr.-Schäff., var. *mus*, pl. ii. fig. 50, p. 58, *basigramma*, Staud., and *conspicua*, Hübn., p. 60, noticed from Kulja; Alphéraky, *l. c.* *A. annexa*, Tr.: transformations described; French, Canad. Ent. xiv. pp. 207–210. *A. cremata*, Butl.: larva described; Blackburn, Ent. M. M. xix. p. 56. *A. depuncta*, Linn. var. from Amasia noticed; Staudinger, Hor. Ent. Ross. xvi. p. 72. *A. helvetina*, Boisd.: the reputed British specimens probably = *Noctua*

augur, var.; Mason, P. E. Soc. 1882, p. x. *A. hyperborea*, var. *carnica*, Her., noticed; Höfner, *l. c.* p. 195. *A. segetum* discussed; Rashetin, Proudy Ent. Ross. xiii. pp. xiv.–xvi.

Triphæna comes, Hübn. (= *orbona*, Fabr.): larva injurious to vine; Girard, Bull. Soc. Ent. Fr. (6) ii. p. lxxxviii.

Pachnobia hyperborea noticed and figured; Swinton, Sci. Goss. xviii. pp. 172, 277 & 278.

Tæniocampa gothica seeking the same resting-place for several days in succession; Fitch, Ent. xv. p. 91.

Orrhodia ligula, Esp., var. (?) from Lepsa noticed; Staudinger, S. E. Z. xliii. p. 47.

Orthosia helvola, Linn., var. *sibirica* from Saisan described; *id. l. c.* p. 26. *O. nitida*, Fabr., and *insueta*, Freyer, noticed; *id.* Hor. Ent. Ross. xvi. pp. 75 & 76.

Xanthia fulva, Blanch., = *carneago*, Guén., *Cerastis ferruginescens*, var. *livilla* from Chili, described; Butler, *l. c.* pp. 133 & 134.

Cirrhoidia xerampelina, var. *unicolor* from Amasia, noticed; Staudinger, Hor. Ent. Ross. xvi. p. 75.

Dianthœcia colletti, Schneid., regarded by Staudinger as a *Mamestra*, is compared with *marmorosa*, Borkh., and *microdon*, Guén.; Schneider, Forh. Selsk. Chr. 1881, 2, pp. 7–10.

Polia centralasiæ, Staud., noticed and figured; Alphéraky, *l. c.* p. 77, pl. iii. fig. 54. *P. flavo-cincta*, var. *meridionalis*, Boisd., recorded as new to Britain; Porritt, Tr. Yorksh. Un. iv. p. 90.

Ammoconia cæcimacula, Fabr., var. *sibirica* from Saisan, described; Staudinger, S. E. Z. xliii. p. 337.

Anytus sculptus, var. *planus* from New York, noticed; Grote, Canad. Ent. xiv. p. 183.

Dasypolia templi recorded from Moldavia; Thierry-Mieg, Feuill. Nat. ii. p. 46.

Hadena maillardi, Geyer (= *pernix*, Geyer), var. (perhaps not distinct from *exulis*, Lef.), *H. lateritia*, Hufn., var. *expallescens*, and *H. bicoloria*, Vill., var. *pallidior* from Central Asia, noticed; Staudinger, S. E. Z. xliii. pp. 40–42. *H. aurea*, Grote, var. from Arizona noticed by him, *l. c.* p. 19. *H. pisi*: variety bred from the dark American nettle [sic]; Gauchler, Ent. Nachr. viii. p. 275. *H. unanimis*, Treitschke, discussed; Lampa, Ent. Tidskr. iii. p. 32.

Xylina cinerea, Riley, = *antennata*, Walk.; Fernald, Papilio, ii. p. 63: but *cf.* also Riley, *l. c.* pp. 101 & 102, who proposes to rename his *cinerea* as var. *grotii* of *antennata*.

Cucullia blattariæ, ab. *anceps* from Amasia, noticed; Staudinger, Hor. Ent. Ross. xvi. p. 78.

Chariclea: *C. pernana*, Grote, is the only N. American species; *Cirrhophanus triangulifer*, Grote, is generically distinct; Grote, *l. c.* p. 183.

Rhodophæa florida, Guén., noticed; Cramer, Papilio, ii. p. 34.

Tamila lucens, Morr., and var. *luxuriosa* from Montana noticed; Grote, Canad. Ent. xiv. p. 175.

Plagiomimicus, Grote: characters of this and allied genera discussed; *id.* Papilio, ii. pp. 184 & 185, *cf.* also Canad. Ent. xiv. p. 182.

Heliothis armigera, Hübn., discussed; Riley's Rep. Ins. 1882, pp. 145–152, pls. i. & xii. fig. 1, Hamilton, Rep. E. Soc. Ont. 1881, p. 30. *H. ononis*, Fabr., and *armiger*, Hübn., varieties from Kulja noticed, Alphéraky, *l. c.* p. 90. *H. nuchalis*, Grote, = *scutosa*, W. V.; Grote, Canad. Ent. xiv. p. 186.

Melicleptria celeris, Grote, noticed by him, *l. c.* p. 171.

Tripudia, *Spragueia*, *Oxylos*, Grote, and *Gyros*, H. Edwards, discussed; Grote, *l. c.* pp. 32, 33, 171, 195 & 196.

Anasta mystelli: supposed parthenogenesis; Watson, Ent. xv. pp. 261 & 262.

Heliodes arbuti: natural history; Buckler, Ent. M. M. xix. pp. 36–40.

Pyrrhia, Hübn.: N. American species noticed; Grote, Bull. U. S. Geol. Surv. vi. p. 564.

Anthœcia inflata, Wallengr., probably belongs to *Heliochilus*, Feld.; Butler, *l. c.* p. 32.

Xanthodes graellsi, Feisth., recorded as French; Valentin, Le Nat. ii. p. 39.

Acontia lucida, var. *triangulum* from Sardinia, described; Costa, Atti Acc. Nap. ix. 6, p. 39.

Eustrotia carneola, Guén.: life-history; Coquillett, Papilio, ii. pp. 57 & 58. *E. propera*, Grote: variation noticed; Grote, *l. c.* p. 184.

Thalpochares gratiosa, Eversm., figured; Alphéraky, *l. c.* pl. iii. fig. 62.

Brephos nothum, var. (?) from Lepsa noticed; Staudinger, S. E. Z. xliii. p. 57.

Plusia. *Triphœna signata*, Phil., = *Plusia virgula*, Blanch.; *P. depauperata*, Blanch., and *P. detrusa* and *fumifera*, Walk., = *P. nu*, Guén.; *P. gammoides*, Blanch., and *biloba*, Walk. (?) noticed; Butler, Tr. E. Soc. 1882, pp. 137 & 138. *P. precotionis* and *simplex*, Guén., and *brassicæ*, Riley: note on larva; Coquillett, Canad. Ent. xiv. p. 60. *P. beckeri*, Staud.: var. from the Abruzzi described; Staudinger, Ent. Nachr. viii. pp. 292–294. *P. biloba*, Steph.: life-history; French, Papilio, ii. pp. 113–115. *P. bractea*: life-history; [Mrs.] Battersby, Ent. xv. pp. 20 & 21. *P. brassicæ*: effect of *Pyrethrum* on the circulation of the larva; Howard, Am. Nat. xvi. p. 1015. *P. dyaus*, Grote, noticed by him as feeding on cabbage; Bull. U. S. Geol. Surv. vi. p. 591.

Anomis erosa, Hübn. Transformations described; Riley, Rep. Ins. 1882, pp. 167–170, pl. viii. fig. 1; *cf.* also Am. Nat. xvi. pp. 327–329.

Aletia: note on food-plants; *id. l. c.* pp. 327–329. *A. argillacea*, Hübn.: abundance in Northern States in 1881, and fondness for fruit; Bruce, Papilio, ii. pp. 62 & 63; *cf.* also Bailey, *tom. cit.* p. 189. *A. xylina*, Say, discussed; Riley, Rep. Ins. 1882, pp. 152–167: hibernation; *id.* Nature, xxvii. p. 214.

Amphipyra tetra. Larva described; Schmidt, Ent. Nachr. viii. p. 321.

Alamis polioides, Guén. Larva described; Edmonds, Tr. E. Soc. 1882, p. 139.

Homoptera lunata, Dru. Transformations described; the three supposed species, *lunata*, Dru., *edusa*, Dru., and *saundersi*, Beth., were reared from eggs laid by one ♀; French, Canad. Ent. xiv. pp. 130–134 & 180.

Homopyralis repentis, Grote, belongs to *Yrias*; Grote, Canad. Ent. xiv. p. 236.

Ædis, Grote, considered by him too near *Ædia*, renamed *Paradis*; New Check List, p. 51.

Leucanitis caucasica, Kol., from Kulja, noticed and figured; Alphéraky, *l. c.* p. 93, pl. iii. fig. 65.

Palpangula cestis, Mén. (= *punctata*, Mén.), and *dentistrigata*, Staud., noticed and the latter figured; *id. l. c.* pp. 94 & 95, pl. iii. fig. 63.

Cirrhobolina mexicana, Behr, var. *vulpina* from Arizona described; H. Edwards, Papilio, ii. p. 14.

Hypocala volans, Walk., noticed; Blackburn & Butler, Tr. E. Soc. 1882, p. 34.

Catocala: list of species taken near Frankford, Pennsylvania; Johnson, Canad. Ent. xiv. pp. 59 & 60. On the occurrence of tufts of hair on the legs of the males of various species of *Catocala* and in *Parthenos nubilis*; Bailey, Kirby, & H. Edwards, Papilio, ii. pp. 51, 52 (fig.), 84, & 146. Grote regards his *C. [illegible]* as probably a variety of *C. neogama*, Abb. & Sm., and briefly characte[illegible] other varieties of different species [illegible] formerly described; [illegible] ii. pp. 8 & 9. *C. amatrix*, Hübn. [illegible] noticed; Fischer, Bull. Buff. Soc. iv. p. 92. *C. cara*, Guén.; transformations described; French, Papilio, i. pp. 167–169. *C. clintoni*, Grote, var. *helene* from Ohio described; Pilate, Papilio, ii. p. 31. *C. concumbens*, Walk., tufts; Bailey, S. E. Z. xliii. p. 392, fig. *C. nupta*, var. from Kulja noticed; Alphéraky, *l. c.* p. 99: feeding on plum; Finch, Ent. xv. p. 133. *C. palaogama*, Guén., var. *annida* described; Fager, Canad. Ent. xiv. p. 120. *C. walshi*, Edw., = *juncturæ*, Walk., and is quite distinct from *arizonæ*, Grote; Butler & Grote, Canad. Ent. xiv. p. 47.

Erebus odora, Linn. (?) taken off the mouth of the La Plata, 250 miles from land; Stretch, Papilio, ii. p. 82.

Drasteria erechthea, Cram. Difference in broods; Packard, Papilio, ii. pp. 147 & 148. Injurious to clover; Saunders, Rep. E. Soc. Ont. 1881, p. 47, fig. 19.

Euclidia triquetra, Fabr., var. *aurantiaca* from Amasia noticed; Staudinger, Hor. Ent. Ross. xvi. p. 79.

Remigia, sp. Larva destructive to rice at Panama; Fowler & Champion, Ent. M. M. xix. p. 112.

New genera and species:—

Isochlora, Staudinger, S. E. Z. xliii. p. 39. Allied to *Luperina*; abdomen in ♂ compressed and slender, in ♀ pointed, with a long ovipositor. Type, *I. viridis* (sp. n., *l. c.*) and var. *viridissima* [cf. also Alphéraky, Hor. Ent. Ross. xvii. p. 78, pl. ii. fig. 51], from Central Asia.

Ala, Staudinger, *l. c.* p. 49. Allied to *Anarta*; type, *A. picteti*, sp. n., *l. c.*; Alphéraky, *l. c.* p. 89, pl. iii. fig. 61, Ala Tau.

Heptapotamia, Alphéraky, *l. c.* p. 75. Allied to *Ulochlana* and *Episema*; abdomen clothed with smooth hairs, longest on the sides; costa of fore-wings straight, fringes long, eyes small. Type, *H. eustratii*, sp. n., *l. c.* pl. iii. fig. 57, near Lake Balkash.

Pitrasa, Moore, Desc. Ind. Lep. Atk. ii. p. 94. Placed after *Palimpsestis*; types, *P. variegata* and *vitellina*, spp. nn., *l. c.* p. 94, pl. iv. figs. 2 & 3, Darjiling.

Tycracona, id. *l. c.* p. 95. Allied to *Acronycta*; types, *T. obliqua* (figured, Waterhouse, Aid, ii. pl. cxviii.), and *transversa*, pl. iv. fig. 5, Darjiling, &c., spp. nn., *l. c.*

Sydiva, id. *ibid.* Allied to *Acronycta*; type, *S. nigro-grisea*, sp. n., *l. c.* p. 96, Darjiling.

Calymera, id. *l. c.* p. 104. Allied to *Eudryas*; type, *C. picta*, sp. n., *l. c.* pl. iv. fig. 7, Darjiling.

Karana, id. *l. c.* p. 106. Placed after *Sasunaga*, Moore; type, *K. decorata*, sp. n., *l. c.* p. 107, Darjiling.

Motama, id. *l. c.* p. 110. Placed after *Apamea*; types, *M. cidarioides*, *aurata*, and *decorata*, spp. nn., *l. c.* pl. iv. figs. 9–11, Darjiling.

Chandata, id. *l. c.* p. 113. Placed after *Celæna*; type, *C. partita*, sp. n., *l. c.* p. 114, pl. iv. fig. 16.

Ranaja, id. *l. c.* p. 121. Placed after *Orthosia*; type, *R. fasciata*, sp. n., *l. c.* p. 121, pl. iv. fig. 18, Darjiling.

Dimya, id. *l. c.* Allied to *Hiptelia*; type, *D. sinuata*, sp. n., *l. c.* p. 9[illegible], pl. iv. fig. 17, Darjiling, &c.

Nikara, id. *l. c.* p. 126. Placed after *Euplexia*; type, *N. castanea*, sp. n., *l. c.* pl. iv. fig. 24, Darjiling.

Hyada, id. *l. c.* p. 129. Allied to *Dasypolia*; type, *H. grisea*, sp. n., *l. c.* p. 130, pl. iv. fig. 26, Sikkim.

Chutapha, id. *l. c.* p. 131. Placed after *Hadena*; type, *C. costalis*, sp. n., *l. c.*, Darjiling.

Jarasana, id. *l. c.* p. 132. Placed after *Cucullia*; type, *J. lativitta*, sp. n., *l. c.*, Benares.

Baorisa, id. *l. c.* p. 133. Allied to *Apsarasa*; type, *B. hieroglyphica*, sp. n., *l. c.* pl. iv. fig. 14, Darjiling.

Hiccoda, id. *l. c.* p. 134. Placed after *Naranga*; type, *H. dosaroides*, sp. n., *l. c.* p. 135, India, Ceylon.

Lugana, id. *l. c.* p. 145. Placed after *Phalga*; types, *L. antennata*, Darjiling, and *renalis*, Calcutta, Andamans, spp. nn., *l. c.* p. 146.

Nagasena, id. *l. c.* p. 151. Allied to *Westermannia*; type, *N. albescèns*, sp. n., *l. c.* p. 152, Darjiling.

Coarica, id. *l. c.* p. 153. Placed after *Gonotis*; type, *C. fasciata*, sp. n., *l. c.* pl. v. fig. 1, Darjiling.

Falana, id. *l. c.* p. 153. Placed next to *Coarica*; type, *F. sordida*, sp. n., *l. c.* p. 154, Cherra Punji, Assam.

Tambana, id. *l. c.* p. 155. Placed after *Amphipyra*; types, *T. variegata* and *catocalina*, pl. v. fig. 3, spp. nn., *l. c.* pp. 155 & 156, Darjiling.

Mithila, id. *l. c.* p. 156. Placed after *Perinænia*; type, *M. lichenosa*, sp. n., *l. c.* p. 157, Darjiling.

Amrella, id. *l. c.* p. 158. Allied to *Eliocræa*; type, *A. angulipennis*, sp. n., *l. c.* pl. v. fig. 6, Darjiling.

Bamra, id. *l. c.* p. 159 (*Polydesmidæ*). Type, *Agriopis discalis*, Moore; add *Felinia albicola*, Walk., and *B. acronyctoides*, sp. n., *l. c.* p. 160, Darjiling.

Oromena, id. *l. c.* p. 160. (*Polydesmidæ*) ; type, *Briarda reliquenda*, Walk.

Donda, id. *l. c.* p. 161. Allied to *Oromena* and *Belciana*; type, *Dandaca eurychlora*, Walk. ; add *D. thoracica*, sp. n., *l. c.* pl. v. fig. 7, Darjiling.

Zarima, id. *l. c.* p. 162. Allied to *Anophia* ; type, *Z. dentifera*, sp. n., *l. c.* pl. v. fig. 19, Darjiling.

Vapara, id. *l. c.* p. 163. Allied to *Erygia*; to include *V. indistincta* and *fasciata* (type), spp. nn., *l. c.*, Darjiling.

Sadarsa, id. *l. c.* p. 164. Allied to *Gyrtona* ; type, *S. longipennis*, sp. n., *l. c.* p. 165, pl. v. fig. 14, Darjiling.

Dordura, id. *l. c.* p. 170. Allied to *Hypatra* ; type, *D. apicalis*, sp. n., *l. c.* pl. v. fig. 20.

Pasipeda, id. *l. c.* p. 171. Placed after *Ophiusa* ; type, *Hulodes palumba*, Guén. (= *Remigia colligens*, Walk.)

Nasaya, id. *l. c.* p. 173. Placed after *Borsippa*; type, *N. hepatica*, sp. n., *l. c.*, Darjiling.

Tochara, id. *l. c.* p. 175. Allied to *Iluza* ; type, *T. obliqua*, sp. n., *l. c.* pl. vi. fig. 27, Khasia Hills, Cherra.

Durdara, id. *l. c.* p. 176. Placed after *Capnodes*; to include *Noctua hirtæa*, Drury (type), and *D. pyraliata*, Calcutta, and *lobata*, pl. v. fig. 16, Khasia Hills, spp. nn., *l. c.* p. 177.

Raparna, id. *l. c.* p. 177. Placed after *Durdara*; to include *R. ochreipennis*, pl. vi. fig. 8 (type), Bengal, *transversa*, Bengal, N.W. Himalaya, and *undulata*, Dharmsala, Calcutta, spp. nn., *l. c.* p. 178.

Sonagara, id. *l. c.* p. 179. Placed after *Mestleta* ; to include *S. strigipennis* (type), Darjiling, *strigosa*, pl. v. fig. 17, Calcutta, spp. nn., *l. c.* p. 180 ; also *Thermesia reticulata*, Walk.

Hingula, id. *l. c.* p. 180. Allied to *Daxata* and *Dagassa* ; types, *H. albo-lunata*, Nilgiris, Cherra Punji, and *cervina*, Manpuri, Calcutta, spp. nn., *l. c.* p. 181.

Harmatelia, id. *l. c.* p. 182. Placed after *Saraca* ; types, *H. bipartita*, Khasia Hills, Cherra Punji, and *basalis*, pl. vi. fig. 13, Cherra, Darjiling, spp. nn., *l. c.* pp. 182 & 183.

Acharya, id. *l. c.* p. 185. Allied to *Egnasia* ; type, *A. crassicornis*, sp. n., *l. c.* pl. vi. fig. 3, Silhet.

Corcobara, id. *l. c.* p. 186. Allied to *Anoratha* ; type, *C. angulipennis*, sp. n., *l. c.* pl. vi. fig. 16, Ceylon, Darjiling.

Apanda, id. *ibid.* Placed after *Corcobara* ; type, *A. denticulata*, sp. n., *l. c.* p. 187, pl. vi. fig. 24, Darjiling.

Harita, id. *l. c.* p. 187. Placed after *Apanda*; type, *H. rectilinea*, sp. n., *l. c.* pl. vi. fig. 23, Khasia Hills.

Mathura, id. *l. c.* p. 188. Allied to *Harita* ; type, *M. albisigna*, sp. n., *l. c.*, Cherra Punji.

Cyathissa, Grote, Bull. U. S. Geol. Surv. vi. p. 576 ; New Check List, p. 23. Allied to *Bryophila* ; wings narrower, external margin of forewings notched. Type, *B. percara*, Morr.

Fota, id. Canad. Ent. xiv. p. 174. Allied to *Hadena* ; type, *F. armata*, sp. n., *l. c.* pp. 175 & 181, Arizona ; add *F. minorata*, sp. n., *l. c.* p. 181, (Arizona ?).

Fotella, id. *l. c.* p. 181. Allied to *Fota*, *Stilbia*, and *Caradrina*; type, *F. notalis*, sp. n., *ibid.*, Arizona.

Neumoegenia, id. Papilio, ii. pp. 132 & 184. Allied to *Acopa*; type, *N. poetica*, sp. n., *ibid.*, Arizona.

Oxycnemis, id. *ibid.* Allied to *Triocnemis*, but with some resemblance to *Hadena*; type, *O. advena*, sp. n., *l. c.* p. 182, Arizona.

Euedwardsia, id. *l. c.* p. 122. *Heliothinæ*; type, *E. neumœgeni*, H. Edw.

Escaria, id. *l. c.* p. 186. Intermediate between *Tarache* and *Eustrotia*; type, *E. clauda*, sp. n., *ibid.*, Arizona.

Azenia, id. *ibid.* Resembles *Spragueia* and *Xanthoptera*; type, *A. implora*, sp. n., *ibid.*, Arizona.

Herrichia, Grote [*nec* Staud.], New Check List, pp. 38 & 64. Allied to *Eriopus*; type, *E. monetifera*, Guén. Renamed *Euherrichia*, id. Papilio, ii. p. 122.

Andrewsia, id. New Check List, p. 41. Allied to *Catocala*; wings less produced, inner and costal margins more parallel, entire; hind wings without mesial band. Type, *C. belfragiana*, Harv.

Epingetis, id. Canad. Ent. xiv. p. 75. Somewhat resembles *Cucullia*; type, *E. notatella*, sp. n., *ibid.*, Montana.

Aletia obscura and *albicosta*, Moore, Desc. Ind. Lep. Atk. ii. p. 97, Darjiling, &c.

Borolia furcifera, id. *l. c.* p. 98, pl. iv. fig. 6, Darjiling.

Mastiphanes extricata, Grote, Bull. U. S. Geol. Surv. vi. p. 575, Arizona.

Lepitoreuma hæsitata, id. *ibid.*, Pennsylvania.

Copablepharon longipenne and *subflavidens*, id. Canad. Ent. xiv. p. 169, Montana.

Leucania dungana, Alphéraky, Hor. Ent. Ross. xvii. p. 83, pl. iii. fig. 56, Kulja; *L. sinuosa*, *rufescens*, Darjiling, p. 102, and *nigrilineosa*, Khasia Hills, p. 103, Moore, l. c.; *L. trifolii*, p. 114, *saccharivora*, and *chilensis*, p. 115, Butler, Tr. E. Soc. 1882, Chili.

Heliophila rimosa, Grote, *l. c.* p. 216, Maine.

Trachodopalpus edmondsi, Butler, *l. c.* p. 116, Chili.

Sesamia fraterna, Moore, *l. c.* p. 103, Dharmsala.

Nonagria subflava, Illinois, and *oblonga*, Kittery Point, Grote, Papilio, ii. pp. 95 & 96.

Tapinostola orientalis, id. Bull. U. S. Geol. Surv. vi. p. 583, Maine.

Platysenta angustiorata, id. *l. c.* p. 584, Maine.

Euthisanotia platensis, Berg, An. Soc. Arg. xiii. p. 172, Argentine Republic, Uruguay.

Gortyna impecuniosa, Grote, Canad. Ent. xiv. p. 184, Centre.

Hydræcia ochreola and *osseola*, Staudinger, S. E. Z. xliii. pp. 42 & 43, Saisan, &c.

Nephelodes (?) *intricans*, Alphéraky, *l. c.* p. 41, pl. ii. fig. 42, Kulja.

Axylia renalis, Moore, *l. c.* p. 103, Cashmir, Punjab.

Xylophasia cauquenensis, Butler, *l. c.* p. 116, Chili.

Dipterygia sikkima, Moore, *l. c.* p. 105, Darjiling.

Spodoptera aspersa, Butler, *l. c.* p. 117, Chili.

Neuria calligrapta, id. *l. c.* p. 118, Chili ; *N. separata*, Moore, *l. c.* p. 107, Sikkim.

Heliophobus lithophilus (? = *Noctua lincifera*, Blanch.), Butler, *l. c.* p. 119, Valparaiso.

Apamea glottuloides, id. *l. c.* p. 120, Valparaiso ; *A. sikkima*, *denticulosa*, pl. iv. fig. 13, and *obliquiorbis*, Moore, *l. c.* p. 109, Darjiling.

Mamestra accurata, Christoph, Hor. Ent. Ross. xvii. p. 110, Russian Armenia ; *M. khorgossi*, pl. ii. fig. 49, p. 65, *vicina*, p. 67, and *sabulorum*, pl. iii. fig. 58, p. 69, Alphéraky, *l. c.*, Kulja ; *M. renalba* and *decorata*, pl. iv. fig. 8, Moore, *l. c.* p. 111, Darjiling ; *M. gnata* and *M.* (*Dianthœcia*) *glaciata*, Grote, *l. c.* p. 170, Arizona.

Miana photophila, and var. *margarita*, Butler, *l. c.* p. 120, Chili ; *M. lucasii*, id. Ann. N. H. (5) ix. p. 89, Melbourne.

Celæna arbuticolens and *anthophila*, id. Tr. E. Soc. 1882, pp. 121 & 122, Chili.

Perigea terranea, *nivco-picta*, and var. *florinda*, id. *l. c.* pp. 123–125, Chili.

Oncocnemis griseicollis, Grote, *l. c.* p. 19, Arizona.

Cuadrina dulcinea and *mœrens*, Butler, *l. c.* p. 125, Chili.

Prospalta stellata, Moore, *l. c.* p. 111, Darjiling.

Ilattia apicalis, *cupreipennis*, p. 112, and *renalis*, p. 113, *id. l. c.*, Darjiling.

Luperina pardaria, pl. iv. fig. 12, *olivascens*, and *lagenifera*, id. *l. c.* p. 114, Darjiling.

Pachetra heterocampa, id. *l. c.* p. 115, pl. iv. fig. 15, Darjiling.

Agrotis trigonica, pl. i. fig. 39, p. 43, *scaramangæ*, pl. ii. fig. 44, p. 47, *juldussi*, pl. iii. fig. 59, p. 49, *polita*, pl. ii. fig. 46, p. 51, *umbrifera*, pl. i. fig. 38, p. 53, *confusa*, pl. ii. fig. 47, p. 61, and *kungessi*, pl. i. fig. 40, p. 62, Alphéraky, *l. c.*, Kulja ; *A. fraterna*, Darjiling, Punjab Hills, and *placida*, pl. iv. fig. 19, Cashmir, Calcutta, Moore, *l. c.* pp. 116 & 117 ; *A. hospitalis*, New York, p. 184 ; *A. dolli* and *niveilinea*, Arizona, Grote, *l. c.* p. 216 ; *A. tesselloides*, California, p. 566, *pellucidalis*, Texas, p. 567, and *dapsilis*, Florida, p. 582, *id.* Bull. U. S. Geol. Surv. vi. ; *A. semifusca*, *clerica*, p. 129, *mamestrina* and var. *chionidia*, pp. 130 & 131, and *edmondsi*, p. 131, Butler, *l. c.* Chili.

Graphiphora vulpina, *interstincta*, p. 118, *stellata*, and *cognata*, p. 119, Moore, *l. c.*, Darjiling, &c.

Hermonassa incisa, *cuprina*, Darjiling, and *lunata*, Cashmir, *id. l. c.* p. 120.

Anomogyna nœnioides, Butler, *l. c.* p. 132, Chili.

Ochropleura diana, id. *ibid.*, Chili.

Tryphœna (?) *tineæformis*[*tineif-*], Tepper, Tr. R. Soc. S. Austr. v. p. 31, S. Australia.

Tæniocampa castanipars, Moore, *l. c.* p. 122, Darjiling.

Perigrapha transparens, Grote, Bull. U. S. Geol. Surv. vi. p. 582, Washington Territory.

Orthosia gratiosa, Staudinger, Hor. Ent. Ross. xvi. p. 76, Amasia.

Anchocelis digitalis, Grote, *l. c.* p. 584, Maine.

Cerastis minna, Butler, *l. c.* p. 134, Valparaiso.

Scopelosoma moffatiana, Grote, *l. c.* p. 583, Maine.

Hiptelia variago, Staudinger, S. E. Z. xliii. p. 44, Saisan &c.; *H. staudingeri*, Alphéraky, *l. c.* p. 86, pl. iii. fig. 60, Kulja.

Zotheca viridifera, Grote, Canad. Ent. xiv. p. 217, Arizona.

Ipimorpha divisa, Moore, *l. c.* p. 123, Darjiling, Simla.

Cosmia (?) *trapezoides*, Staudinger, S. E. Z. xliii. p. 45, Lepsa.

Dianthœcia orientalis and *D.* (?) *picturata*, Alphéraky, *l. c.* pp. 71 & 73, pls. ii. fig. 52, and iii. fig. 53, Kulja; *D. stellifera*, p. 123, *literata*, *venosa*, and *calamistrata*, pl. iv. fig. 23, p. 124, Moore, *l. c.* Darjiling.

Hecatera transversa and *modesta*, Moore, *l. c.* p. 125, Cashmir.

Polia centralasiæ[!], Staudinger, S. E. Z. xliii. p. 37, Saisan; *P. manisadjiani*, id. Hor. Ent. Ross. xvi. p. 73, Amasia.

Euplexia sinuata, Moore, *l. c.* p. 125, pl. iv. fig. 25, Darjiling.

Eurhrois magnifica, id. *l. c.* p. 127, Darjiling.

Dryobata leucosticta, id. *l. c.* p. 129, pl. iv. fig. 22, Darjiling.

Hadena arschanica and *songariæ*, Alphéraky, *l. c.* pp. 78 & 80, pl. ii. figs. 45 & 48, Kulja; *H. constellata*, fig. 21, *distans*, and *hastata*, fig. 20, Moore, *l. c.* p. 130, pl. iv., Darjiling, &c.; *H. idonea*, Texas, Kansas, Wisconsin, p. 18, and *hausta*, Maine, p. 217, Grote, Canad. Ent. xiv.; *H. misera*, id. Bull. U. S. Geol. Surv. vi. p. 582, Illinois, New York; *H. [illegible] chidia*, Butler, *l. c.* p. 135, Chili.

Xylina cossoides, id. *l. c.* p. 136, Chili.

Cucullia duplicata, Staudinger, S. E. Z. xliii. p. 47, Lepsa; *C. atkinsoni*, Moore, *l. c.* p. 131, Darjiling; *C. montanæ*, Grote, Canad. Ent. xiv. p. 175, Montana.

Naranga quadrivittata and *ferruginea*, Moore, *l. c.* p. 134, Calcutta.

Chloridea molochitina, Berg, An. Soc. Arg. xiv. p. 282, Argentine Republic.

Lygranthœcia parmeliana, Maryland, and *constricta*, N. Carolina, H. Edwards, Papilio, ii. pp. 14 & 128.

Anarta (?) *haberhaueri*, Staudinger, *l. c.* p. 50, Ala Tau.

Acontia vialis (Rioy, MS.), Moore, *l. c.* p. 135, Dharmsala, Darjiling; *A. inconcisa*, Butler, Ann. N. H. (5) x. p. 229, Duke of York Island; *A. miegii*, Mabille, Le Nat. ii. p. 134, Madagascar; *A. venusta*, Berg, *l. c.* p. 283, Argentine Republic.

Annaphila fidonioides, Butler, Tr. E. Soc. 1882, p. 137, Chili.

Tarache expolita, Grote, Papilio, ii. p. 131, Arizona.

Tripudia basicinerea, id. Bull. U. S. Geol. Surv. vi. p. 563, Arizona; *T. lixiva*, id. Canad. Ent. xiv. p. 173, Arizona.

Trothisa (*Thalpochares*) *margaritæ*, Berg, *l. c.* p. 285, Uruguay.

Thalpochares rivula, Moore, *l. c.* p. 140, Calcutta; *T. fortunata* and *perita*, Grote, *l. c.* p. 171, Arizona.

Eustrotia propera and *distincta*, Grote, Papilio, ii. pp. 132 & 184, Arizona; *E. flaviguttata*, id. Canad. Ent. xiv. p. 187, Texas.

Eupseudosoma florid[*an*]*um*, id. *ibid.*, Florida.

Spragueia pardalis, Florida, and *funeralis*, Arizona, p. 33, *sordida*, Texas, p. 217, *id.* l. c.; *S. magnifica*, Arizona, and *inorata*, Texas, *id.* Papilio, ii. p. 183.

Xanthoptera clausula, id. *l. c.* p. 186, Arizona.

Prothymia plana, id. *l. c.* p. 184, Arizona.

Erastria delicatula, Christoph, *l. c.* p. 112, Russian Armenia; *E. albicosta*, *fusca*, p. 141, *nubila*, and *cidarioides*, p. 142, Moore, *l. c.* Darjiling; *E. nubila*, Berg, *l. c.* p. 284, Argentine Republic.

Bankia renalis, Dharmsala, Calcutta, p. 142, *basalis*, Darjiling, Shanghai, and *obliqua* (Rioy, MS.), Dharmsala, Cashmir, Changra, p. 143, Moore, *l. c.*

Callopistria recurvata, id. *l. c.* p. 144, Darjiling, Calcutta, Ceylon; *C. insularis*, Butler, Ann. N. H. (5) x. p. 230, Duke of York Island.

Ægilia obscura and *angulata*, Moore, *l. c.* p. 146, Darjiling.

Eutelia inextricata, id. *l. c.* p. 147, Darjiling, Cherra Punji.

Chlumetia alternans, id. *ibid*, Darjiling.

Abrostola anophioides, id. *l. c.* p. 148, Darjiling.

Plusia reticulata, p. 148, *pannosa*, *confusa*, Darjiling, &c., and *argyrosigna*, Cashmir, p. 149, Moore, *l. c.*; *P. scapularis*, Washington Territory, and *accurata*, Arizona, H. Edwards, *l. c.* p. 127. *P. surena*, Grote, Bull. U. S. Geol. Surv. vi. p. 585, Maine; *P. chilensis*, Butler, Tr. E. Soc. 1882, p. 138, Chili; *P. bonaerensis*, Berg, *l. c.* p. 287, Buenos Aires.

Plusiodonta auripicta, Moore, *l. c.* p. 150, Darjiling, Cherra.

Calpe fasciata, id. *l. c.* p. 151, Darjiling.

Conotis brunnea, Moore, *l. c.* p. 153, Calcutta; *G. hawaiiensis*, Butler, *l. c.* p. 32, Honolulu.

Thalatta fasciosa, Moore, *l. c.* p. 154, pl. v. fig. 2, Cherra Punji.

Amphipyra corvus (Motsch., MS.), Khasia Hills, and *cupreipennis*, Darjiling, *id. l. c.* pp. 154 & 155

Homoptera terrena, Mabille, *l. c.* p 100, Madagascar.

Hyrias clientis and *crudelis*, Grote, Canad. Ent. xiv. pp. 236 & 237. Arizona.

Blenina pannosa, fig. 4, Calcutta, *variegata*, p. 157, and *quinaria*, fig. 5, Darjiling, p. 158, Moore, *l. c.* pl. v.

Toxocampa cucullata, id. *l. c.* p. 159, Nynee Tal, N. W. Himalayas.

Eubolina meskii, H. Edwards, *l. c.* p. 128, Texas.

Synedoida cervina, id. *l. c.* p. 129, Arizona; *S. insperata*, Grote, Canad. Ent. xiv. p. 176, Arizona.

Callyna semivitta, Moore, *l. c.* p. 161, Darjiling.

Anophia perdicipennis, id. *l. c.* p. 162, pl. v. fig. 18, Darjiling; *A. sericea*, Butler, Ann. N. H. (5) x. p. 230, Duke of York Island.

Stictoptera olivascens, Moore, *l. c.* p. 164, Khasia Hills.

Stibadium aureolum, H. Edwards, *l. c.* p. 126, Arizona.

Stiria variabilis, Moore, *l. c.* p. 164, Darjiling; *S. sulphurea*, Neumoegen, Papilio, ii. p. 135, Arizona.

Acopa incana, H. Edwards, *l. c.* p. 128, Arizona.

Plagiomimicus expallidus, Grote, Papilio, ii. p. 185, Montana.

Leucanitis saisani and *obscurata*, Staudinger, S. E. Z. xliii. pp. 53 & 55, Saisan, &c.

Palpangula fractistrigata, Alphéraky, *l. c.* p. 96, pl. iii. fig. 64, Kulja.

Gyrtona albodentata, Moore, *l. c.* p. 165, Cherra Punji, Khasia Hills.

Melipotis strigipennis and *costipannosa*, pl. v. fig. 8, Moore, *l. c.* pp. 165 & 166, Darjiling; *M. perlata*, H. Edwards, *l. c.* p. 14, Arizona.

Catocala tapestrina, Moore, *l. c.* p. 166, pl. v. fig 13, Darjiling; *C. desdemona*, H. Edwards, *l. c.* p. 15, Arizona.

Purbia muscigera, Butler, Ann. N. H. (5) x. p. 230, New Britain.

Phyllodes ornata, Moore, *l. c.* p. 166, Darjiling; *P. pratexatus*, Mabille, *l. c.* p. 134, Madagascar.

Sypna plana, fig. 24, Cherra Punji, *floccosa*, fig. 23, *brunnea*, p. 167, *albovittata*, fig. 25, Darjiling, and *pannosa*, fig. 12, Khasia Hills, p. 168, Moore, *l. c.* pl. v.

Spirama modesta, id. *l. c.* p. 168, Silhet, Darjiling.

Hypopyra distans, id. *l. c.* p. 169, Bombay.

Hamodes marginata, id. *ibid.*, Darjiling.

Ophiodes adusta, Cherra Punji, and *indistincta*, Khasia Hills, *id. l. c.* p. 169, pl. vi. figs. 11 & 12.

Pseudophia fixseni, Christoph, *l. c.* p. 113, Russian Armenia.

Ophiusa falcata, Moore, *l. c.* p. 171, pl. vi. fig. 14, Khasia Hills.

Chalciope disjuncta, id. *l. c.* p. 171, Bengal, Bombay.

Euclidia catocalis, Staudinger, S. E. Z. xliii. p. 52, Saisan, Lepsa; *E. intercalaris*, Grote, Bull. U. S. Geol. Surv. vi. p. 563, New Mexico.

Phytometra tristis, Butler, Ann. N. H. (5) ix. p. 90, Melbourne.

Poaphila quadrilineata, fig. 22, Darjiling, Cherra Punji, *oculata*, fig. 11, Bengal, *pallens*, fig. 9, Calcutta, *uniformis*, fig. 10, Parimath, Calcutta, Moore, *l. c.* p. 172, pl. v.

Trama griseipennis, Grote, Canad. Ent. xiv. p. 183, Arizona.

Pleonectyptera historialis, id. *l. c.* p. 188, Arizona.

Borsippa marginata, Moore, *l. c.* p. 173, Darjiling.

Dierna multistrigaria, id. *l. c.* p. 173, Bombay, Cherra.

Phurys fasciosa, fig. 6, *similis*, fig. 5, Darjiling, and *dissimilis*, Cherra Punji, *id. l. c.* p. 174, pl. vi.

Iluza transversa, Darjiling, and *duplexa*, Khasia Hills, *id. l. c.* p. 174, pl. vi. figs. 15 & 7.

Sanys flexus, id *l. c.* p. 175, Cherra Punji.

Thermesia oblita, id. *l. c.* p. 176, Bengal.

Capnodes pallens, id. *ibid.* pl. v. fig. 21, Calcutta.

Antiblemma guttula, H. Edwards, *l. c.* p. 129, Georgia.

Ctypansa bocanidea, Butler, Ann. N. H. (5) x. p. 231, Duke of York Island.

Selenis reticulata and *obscura*, Moore, *l. c.* p. 178, pl. vi. figs. 9 & 10, Darjiling.

Homopyralis miserulata, Grote, Canad. Ent. xiv. p. 185, New Mexico.

Matigramma rubro-suffusa, id. *l. c.* p. 172, Arizona.

Mestleta angulifera and *acontioides*, pl. v. fig. 15, Moore, *l. c.* p. 179, Calcutta.

Zethes amynoides, id. *l. c.* p. 181, pl. vi. fig. 2, Calcutta.

Thyridospila fasciata, id. *ibid.* pl. vi. fig. 20, Darjiling.

Saraca panaosa, id. *l. c.* p. 182, Cherra, Darjiling.

Rhæsena obliquifasciata, id. *l. c.* p. 183, Bombay, Calcutta.

Caltripalpa indistincta, Calcutta, and *trifasciata*, pl. vi. fig. 1, Cherra Punji, *id. l. c.* pp. 183 & 184.

Egnasia khasiana, Khasia Hills, *sinuosa*, Calcutta, Moulmein, *costi-*

pannosa, Darjiling, *castanea*, Khasia Hills, Darjiling, p. 184, and *morosa*, pl. vi. fig. 4, Darjiling, p. 185, *id. l. c.*

Hypsynchina angulifascia, id. *l. c.* p. 188, Masuri, Cashmir.

Deltoidæ.

Eurypta, Led. *Hypocrita flaviceps*, Burm., belongs to this genus; Berg, An. Soc. Arg. xiii. pp. 183 & 184.

Hypena baltimoralis, Guén. Larva and pupa described; Packard, Papilio, ii. pp. 181 & 182.

Capis, Grote, Canad. Ent. xiv. p. 20 (*cf.* also Papilio, ii. p. 185). Allied to *Sisyrhypena*, but with shorter and broader wings; type, *C. curvata*, sp. n., *ll. cc.*, New York. (Description severely criticised by J. B. Smith, *op. cit.* pp. 100 & 139; *cf.* also Grote, p. 119.)

Rivula sericealis. Natural history; Buckler, Ent. M. M. xix. pp. 49–53.

New genera and species:—

Cephena, Moore, Desc. Ind. Lep. Atk. ii. p. 196. Placed after *Aginna*; type, *C. costata*, sp. n., *l. c.* pl. vi. fig. 17, Khasia Hills, Darjiling.

Aethala, id. *l. c.* Next to last; type, *Bocana silenusalis*, Walk. (figured pl. vi. fig. 22).

Pasira, id. *l. c.* Allied to *Rivula*; type, *P. ochracea*, sp. n., *l. c.*, Calcutta.

Bibacta, id. *l. c.* Allied to *Eckana*; type, *B. truncata*, sp. n., *l. c.* p. 198, pl. vi. fig. 25, India.

Eulintneria, Grote, Bull. U. S. Geol. Surv. vi. p. 564. Allied to *Tortricodes*; type, *T. bifidalis*, Grote.

Hypena diagonalis, Alphéraky, Hor. Ent. Ross. xvii. p. 101, pl. iii. fig. 66, Tian-Chian and Margelan; *H. comes*, Butler, Ann. N. H. (5) x. p. 233, New Britain; *H. ochreipennis*, Darjiling, *tortuosa*, Deyra, Darjiling, p. 188, *divaricata*, Khasia Hills, Darjiling, *ophiusoides*, Khasia Hills, *mediana*, Bengal, *incurvata*, *cidarioides*, Khasia Hills, p. 189, *externa*, *flexuosa*, Darjiling, *griseipennis*, Cherra, *lativitta*, Darjiling, p. 190, *modesta*, Cherra, Darjiling, *triangularis*, Khasia Hills, *occatus*, Cherra Punji, Khasia Hills, *absimilis*, Khasia Hills, *strigifascia*, Darjiling, p. 191, *similata*, Khasia Hills, Calcutta, and *umbripennis*, Khasia Hills, p. 192, Moore, Desc. Ind. Lep. Atk. ii.

Herminia vialis, Cherra Punji, *restricta*, p. 192, *lineosa*, and *duplexa*, pl. vi. fig. 18, Darjiling, p. 193, *id. l. c.*

Madopa quadrilineata, id. *l. c.* p. 193, Darjiling.

Zanclognatha erecta and *undulata*, id. *ibid.*, Darjiling.

Bertula vialis and *placida*, id. *l. c.* p. 194, Darjiling.

Avitta fasciosa, id. *ibid.*, pl. vi. fig. 26, Khasia Hills.

Bocana renalis, Cherra, Khasia Hills, p. 194, *picta*, fig. 21, Khasia Hills, and *marginata*, fig. 19, Darjiling, p. 195, *id. l. c.* pl. vi.

Aginna similis, Darjiling, and *simulata*, Bombay, Calcutta, id. *l. c.* p. 195.

Rivula pallida, id. *l. c.* p. 197, Calcutta.

Locastra monticolens, Butler, Tr. E. Soc. 1882, p. 34, Honolulu.

GEOMETRIDÆ.

HEDEMANN, W. VON. Beitrag zur Lepidopteren-Fauna des Amur-Landes (Fortsetzung). Hor. Ent. Ross. xvi. pp. 43–57 & 257–272 (misprinted pp. 241–256), pl. xiii.

Relates to *Geometridæ*. The following are the most important observations on known species:—*Acidalia rufularia*, Eversm. (*rufinaria*, Staud.), = *ruficiliaria*, *vitellinaria*, Eversm., fig. 1, *Timandra puziloi*, Ersch., = *rectistrigaria*, Eversm., ♂, figs. 2 & 2*a*, *Rhyparia melanaria*, Linn., ab. *hanseni* from Irkutsk noticed (p. 244), another aberration figured (fig. 12), and *askoldinaria*, Oberth., is probably a third; *Abraxas marginata*, Brem., var. *amurensis*, Hed., = *Lomaspilis opis*, Butl., *Endropia snelleni*, Hed., = *Macaria indictinaria*, Brem., *Epione acuminaria*, Eversm. (= *Aspilates glessaria*, Christoph, and *Cleogene opulentaria*, Staud, *Biston* (?) *lefuarius*, Ersch. (= *Nyssiodes olgaria*, Oberth., and *Ereuxa maturaria*, Christoph), fig. 13, *Gnophos creperaria*, Ersch., fig. 3, *Cidaria nævata*, Feld. & Rog. (= *suavata*, Christoph), fig. 11, *deflorata*, Ersch., fig. 6, *modestaria*, Ersch., fig. 7, *incurvaria*, Ersch., fig. 8, *Eupithecia sinuosaria*, Eversm., fig. 10.

Grote remarks on various North American *Geometridæ* previously described by himself; Canad. Ent. xiv. pp. 106–111.

Butler (Tr. E. Soc. 1882, pp. 339–427, pl. xvi.) notices the following known *Geometridæ*, chiefly from Chili:—*Acrosemia flavaria*, Blanch., and *quietaria*, Feld. & Rog., var. *Rumia aurantiacaria*, Blanch., var. *simplicior*; *Perusia præcisaria*, Herr.-Schäff. (♀ = *Numeria* ? *inusta*, Feld. & Rog.) and var. (?) *conspersa*, fig. 1; *Erosina cervinaria*, Blanch., fig. 4, *Tetracis chilenaria*, Blanch., fig. 2, and varr. *definita* and *continua*; *Paragonia*, Feld. & Rog., characterized; *Paragonia deustata*, Feld. & Rog., fig. 3; *Monoctenia*, Guén., noticed; *M. chilenaria*, Feld. & Rog., fig 13; *Opisogonia* (?) *tensata*, Feld. & Rog., *Honorana notataria*, Blanch., *Tephrosia marmoraria* and *incongruaria*, Walk., = *Bryoptera convallata* and *canitiata*, Guén.; *Pharmacis valdiviata*, Feld. & Rog., and var. *albo-striata*, *Psamatodes ferruginaria*, Blanch., fig. 7, and *chilenaria*, Blanch., fig. 6; *Sestra*, *Ozola*, &c., probably belong to the *Ennomidæ* instead of to the *Fidoniidæ*; *Negla perplexata*, Walk., = *Endropia packardi*, Dew.; *E. nachtigali*, *tenuiorata*, and *perplexata* belong to *Narthecusa*; *Chlenias madidata*, Feld. & Rog.; *Bacillogaster*, Blanch., was erroneously referred by him to the *Crambidæ*; *B. hypparia*, Feld. & Rog., *Oporobia cymatophora*, Feld. & Rog.; *Hammaptera*, Herr.-Schäff., is allied to *Larentia* and *Lobophora*; *Rhopalodes virescens*, Phil., fig. 10, *Amathia lineolaria*, Blanch., *Pachrophylla lineata*, Blanch., figs. 8 & 9, and var. *obelata*, Feld. & Rog.; *Tomopteryx amœna*, Phil. (♀ = *Alsophila ternata*, Feld. & Rog.), *Scordylia vittata*, Phil. (= *Heterusia mesenata*, Feld. & Rog., and ? *Phalæna ceraria*, Mol.), *Coremia infundibulata*, Guén. (= *Melanippe producta*, *Cidaria remissata*, and *C. instipata*, Walk.), *Camptogramma plemyrata*, Feld. & Rog.; *Phyllia triangularia*, Blanch. (= *Eubolia* (?) *liburnaria*, Guén.), pl. xvi. fig. 11, *Sarracena pellicata* and *declinaria*, Feld. & Rog.

Nemoria viridata, *Cidaria unifasciata*, *Eupitheeia pygmæata* and *selinata*. Larvæ, &c., noticed; Stange, S. E. Z. xliii. pp. 512 & 513.

Timandra amata, *Boarmia crepuscularia*, and *Cidaria ferrugata* noticed from Java; Snellen, Tijdschr. Ent. xxv. p. cxxvii.

Agathia lacunaria and *geometra* (?) *vestita*, Hed., = *A. carissima* and *Aracina muscosa*, Butl., respectively; Hedemann, Hor. Ent. Ross xvi. p. 57.

Idiodes mitigata, Guén., is figured by Felder as *inspirata*, Guén.; *Choara siculoides*, Walk., is an *Idiodes*. Butler, Ann. N. H. (5) ix. p. 90.

Rumia crataegata. Egg described; Osborne, Sci. Goss. xviii. pp. 13–15.

Eugonia subsignaria, Hübn.: formerly destructive in the United States; now nearly exterminated by the English sparrow; Grote, Bull. U. S. Geol. Surv. vi. pp. 588 & 589. Larva destructive to apple-trees, &c.; Dodge, Canad. Ent. xiv. pp. 30–32.

Selenia kentaria, *Endropia textrinaria*, *homuraria*, and *vinulentaria*, Grote & Rob., noticed; Grote, Papilio, ii. pp. 100 & 101.

Nematocampa (?) *straminea*, Butl., noticed and figured; Hedemann, *l. c.* p. 49, pl. x. fig. 2.

Odontopera serrata, Brem., ♂ described; *id. l. c.* pp. 47 & 48.

Phigalia pilosaria. Rudimentary wings of ♀ noticed; Hodgson, Ent. xv. p. 116.

Biston græcarus, Staud., var. *florentina*, described; Stefanelli, Bull. Ent. Ital. xiv. pp. 221 & 222.

Amphidasis betularia recorded from Ireland; Glazebrook, Ent. xv. pp. 17 & 18.

Tephrosia crepuscularia and *biundularia*. On rearing dark varieties; Llewelyn, Ent. M. M. xviii. p. 274.

Gnophos dolesaria, Herr.-Schäff., noticed; Von Nolcken, S. E. Z. xliii. pp. 176–178.

Geometra semicrocea and *submissaria*, Walk., = *Chlorochroma decisissima*, Walk., and *carenaria*, Guén., respectively; Butler, *l. c.* p. 92.

Rhacheospila rubrifrontaria, Pack., renamed *Aplodes packardaria*; Grote, New Check List, p. 46.

Thalera fimbrialis, Scop., var. from Moscow, noticed; Albrecht, Bull. Mosc. lvi., 4, p. 390.

Asthena candidata, aberration; Poujade, Bull. Soc. Ent. Fr. (6) ii. pp. xc. & xci.

Acidalia, sp.: large numbers of a small Chalcid bred from one larva; Millière, Rev. d'Ent. i. p. 167. *A. punctata*, Treitschke, var. *dignata*, Guén., from the Amur, noticed; Hedemann, *l. c.* pp. 43 & 44

Macaria infixaria and *porrectaria*, Walk., = *remotaria*, Walk.; Butler, *l. c.* p. 92.

Strenia clathrata, var. noticed; Fitch, P. E. Soc. 1882, p. i.

Phasiane petraria. Note on larva; Lallemand, CR. Ent. Belg. xxvi. p. ci.

Fidonia notataria, Walk.: transformations described; Goodell, Canad. Ent. xiv. pp. 199 & 200. *F. piniaria*: dark var. noticed; Boyd, P. E. Soc. 1882, p. vii.

Abraxas grossulariata and *ribearia* noticed, and the latter figured;

Bethune, Rep. E. Soc. Ont. 1881, pp. 83 & 84, figs. 51 & 52. *A. marginata*, Linn., var. *amurensis*, noticed; Hedemann, *l. c.* p. 44.

Nassunia caffraria, Linn., noticed and neuration figured; Aurivillius, Sv. Ak. Handl. xix. 5, pp. 164 & 165, fig. 4.

Euschema bellonaria, Guén. Larva and pupa described and figured; Dewitz, Verh. L.-C. Ak. xliv. pp. 267 & 268, pl. ix. figs. 10 & 10*a*, *b*.

Hybernia tiliaria, Harr. Larva and imago noticed and figured; W. Saunders, Canad. Ent. xiv. pp. 222 & 223, fig. 24.

Chimatobia brumata noticed, Bethune, *l. c.* p. 84; Gard. Chron. (2) xviii. p. 847.

Larentia turbata, var. *pyrenæata* (v.), and *L. infidata*, var. *cæruleata* noticed; Oberthür, Bull. Soc. Ent. Fr. (6) ii. p. cliv.

Emmelesia blandiata: natural history; Buckler, Ent. M. M. xviii. pp. 180–184. Recorded from Surrey; Hutchinson, Ent. xv. pp. 235 & 261. *E. tæniata*: life-history; Hodgkinson, Ent. xv. pp. 285 & 286.

Glaucopteryx cæsiata (Butl., *nec* Lang), renamed *inventaraia* [sic]; Grote, Bull. U. S. Geol. Surv. vi. p. 591.

Eupithecia: list of species of Austro-Hungary (65 established and 5 doubtful), with remarks; Bohatsch, Wien. ent. Z. i. pp. 105–110, 129–134, 161–166 & 185–189. Bohatsch also publishes a critical revision of the 34 species described by Treitschke, based on an examination of his types; *l. c.* pp. 279–282 & 308–312. *E. abietaria*, Götze (= *strobilata*, Borkh.), *togata*, Fabr., *lariciata*, Freyer, *castigata*, Hübn., and *semigraphata*, Bruand: transformations described and specific characters indicated; Speyer, S. E. Z. xliii. pp. 332–388. *E. mnemosynata*, Mill.: variation of larva; Von Nolcken, S. E. Z. xliii. pp. 178 & 179. *E. satyrata*, Hübn., var. *sub-atrata* from Saisan and Lepsa noticed; Staudinger, S. E. Z. xliii. p. 77. *E. separata*, Staudinger, noticed by him; Hor. Ent. Ross. xvi. p. 80. *E. succenturiata*, Linn.: food-plants; Lux & Wake, and Wackerzapp, Ent. Nachr. viii. pp. 277, 278, 295 & 296. *E. togata* feeding on galls of *Chermes abietis*; Schmidt, Ent. Nachr. viii. p. 319. *E. ultimaria*, Dup., noticed; Stevens, Ent. xv. p. 18. *E. veratraria*, Herr.-Schäff.: ♀ remaining three years in pupa, and then the perfect insect found, when killed, to be infested with an enormous number of a minute *Acarus*; Millière, Rev. d'Ent. i. pp. 16, 167 & 168.

Thera contractata, Pack., feeds on "hackmattock;" Packard, Papilio, ii. p. 183.

Hypsipetes elutata. Variation and food-plants; Porritt, Ent. xv. pp. 284 & 285.

Coremia (?) *solutata*, Walk., is probably a *Larentia*; Butler, *l. c.* p. 94.

Camptogramma extranciata and *annuliferata*, Walk., = *mecynata*, Guén. *id. l. c.* p. 95.

Scotosia dubitata, Harv. (*nec* Linn.), renamed *indubitata*; Grote, Bull. U. S. Geol. Surv. vi. p. 591.

Cidaria ferrugata, Clark, var. *asiatica*, Staud., and *C. tersata*, Hübn., var. *tetricata*, Guén., noticed from Saisan, &c.; Staudinger, S. E. Z. xliii. pp. 70 & 72. *C. olivata*, W. V., discussed; Thedenius, Ent. Tidskr. iii. pp. 81 & 82. *C. russata*, Linn., in Arran and in the Hebrides; Weir, Ent. xv. p. 284: variety noticed by Porritt, *l. c.* p. 285. *C. vittata*,

Borkh. (= *lignata*, Hübn.) : transformations noticed ; Hoffmann, S. E. Z. xliii. p. 101.

Eubolia proximaria, Ramb., noticed from Sardinia ; Costa, Atti Acc. Nap. ix. 11. p. 39.

Ortholitha vicinaria, Dup., var. noticed; Staudinger, S. E. Z. xliii. p. 65.

Odezia tibialis recorded from Moldavia; Thierry-Mieg, Feuill. Nat. ii. p. 46.

Stamnodes pauperaria, Ev., and var. *divitiaria*, from Central Asia, noticed ; Staudinger, S. E. Z. xliii. pp. 66 & 67.

Prionophora ruptella, Walk. : transformations noticed, it belongs to the *Geometridæ*, and not to the *Crambidæ* ; Meyrick, P. Linn. Soc. N. S. W. iv. p. 209.

New genera and species :—

Gonogala, Butler, Tr. E. Soc. 1882, p. 340. Allied to *Uropteryx* ; wings of the same shape as *Tetracis*. Type, *G. lactea*, sp. n., *l. c.* p. 341, Chili.

Calcaritis, Von Hedemann, Hor. Ent. Ross. xvi. p. 50. Differs from *Scotosia* in wanting nervule five of the hind wings; type, *C. pallida*, sp. n., *l. c.* pl. x. fig. 3, Amur.

Syncirsodes, Butler, *l. c.* p. 343. Allied to *Cirsodes* ; wings shaped as in *Apicia*. Type, *S. straminea*, sp. n., *ibid.*, Chili.

Macrolyrcea, id. *l. c.* p. 349. Allied to *Lyrcea* and *Metrocampa* ; type, *M. mœsta*, sp. n., *ibid.*, Chili.

Dectochilus, id. *l. c.* p. 356. Differs from *Azelina* in the simple antennæ of the ♂ ; type, *Gonodontis autucaria*, Feld. & Rog. (noticed, *l. c.* p. 357).

Euangerona, id. *l. c.* p. 359. Allied to *Angerona* ; more slender ; antennæ simple in ♂. Type, *E. valdiviæ*, sp. n., *ibid.*, Valdivia.

Microclysia, id. *l. c.* p. 359. Allied to *Endropia*, but antennæ of ♂ simple ; type, *M. reticulata* and var. *ferruginea*, sp. n., *l. c.* p. 360, Chili.

Digonis, id. *l. c.* p. 360. Allied to *Metanema* ; to include *D. aspersa*, *alba*, p. 361, *cuprea*, and varr. *olivacea* and *fusca*, p. 362, *punctifera*, and varr. *maculosa*, *acuminata*, p. 363, *terranea*, and *fumosa*, p. 364, Chili.

Microbiston, Staudinger, S. E. Z. xliii. p. 60. Allied to *Biston* ; type, *M. tartaricus*, sp. n., *ibid.*, between Saisan and Lepsa.

Plectroboarmia, Butler, *l. c.* p. 366. Allied to *Boarmia* and *Tephrosia* ; type, *P. sordida*, sp. n., *ibid.*, Chili.

Chlorotimandra, id. *l. c.* p. 369. Allied to *Timandra* ; type, *C. viridis*, sp. n., *ibid.*, Chili.

Pseudaleucis, id. *l. c.* p. 371. Allied to *Mychonia* and *Aleucis* ; types, *P. misera* and *irrorata*, spp. nn., *ibid.*, Chili.

Eucaterva, Grote, Canad. Ent. xiv. p. 109, Papilio, ii. pp. 80, 143 & 144, & Bull. U. S. Geol. Surv. vi. p. 564. Allied to *Caterva* ; type, *C. variaria* (var. *labesaria* also noticed), spp. nn., *ibid.*, Arizona.

Abraxides, Aurivillius, Sv. Ak. Handl. xix. 5, p. 165. Antennæ of ♂ long, strongly pectinated ; palpi short, third joint very small : femora squamous, not hairy ; hind tibiæ with four spurs. Type, *Phalæna tricinctaria*, Linn.

Pseudosestra, Butler, *l. c.* p. 389. Allied to *Sestra*; type, *P. bella*, sp. n., *ibid.*, Valparaiso.

Pterotocera, Staudinger, *l. c.* p. 59. Allied to *Hybernia*; type, *H. declinata*, sp. n., *ibid.*, Saisan.

Phrissogonus, Butler, Ann. N. H. (5) ix. p. 94. Allied to *Microdes* and *Eupithecia*; type, *Scotosia canata*, Walk.

Chrysolarentia, id. *ibid.* Allied to *Larentia*; to include *Coremia vicissata*, Guén., and allies, and *C. conifasciata*, sp. n., *l. c.* p. 93, Melbourne.

Trichopleura, Staudinger, *l. c.* p. 68. Intermediate between *Triphosa* and *Eucosmia*; type, *T. palvarctica*, sp. n., *l. c.* p. 69, Saisan, &c.

Cyclica, Grote, Canad. Ent. xiv. p. 174. *Larentiinæ*; type, *C. frondaria*, sp. n, *ibid.*, Arizona.

Haplopteryx, Butler, Tr. E. Soc. 1882, p. 397. Allied to *Lobophora*; type, *H. anomala*, sp. n., *l. c.* p. 398, Chili.

Hoplosauris, id. *l. c.* p. 398. Allied to *Tatosoma*; type, *H. heliconoides*; add *H.* (?) *alba*, p. 399, and *H.* (?) *mœsta*, p. 400, spp. nn., Chili.

Hasodima, id. *l. c.* p. 403. Allied to *Lobophora*; type, *H. elegans*, sp. n., *ibid.*, Chili.

Odontothera, id. *l. c.* p. 409. Allied to *Thera* and *Hypsipetes*; types, *O. virescens* and *debilis*, pp. 409 & 410, spp. nn., Chili.

Synpelurga, id. *l. c.* p. 417. Allied to *Pelurga* and *Dineurodes*, but ♂ with short ciliated antennæ; type, *S. corralensis*, sp. n., *ibid.*, Chili.

Scotocoremia, id. *l. c.* p. 418. Allied to *Cidaria*; type, *S. obscura*, sp. n., *ibid.*, Chili.

Tanagridia, id. *l. c.* p. 425. Placed after *Heterophleps*; type, *T. fusca*, sp. n., *ibid.*, Chili.

Carpholithia, id. *l. c.* p. 426. Allied to *Hedyle*; types, *C. cinerea* and *crambina*, spp. nn., *l. c.* pp. 426 & 427, Chili.

Oxydia rhoda, Butler, Tr. E. Soc. 1882, p. 341, Chili.

Apicia valdiviana, id. *l. c.* p. 342, Valdivia.

Perusia rubripicta and var. (?) *ignescens*, and *P. maculata* and var. *flava*, id. *l. c.* pp. 345 & 346, Chili.

Gynopteryx plagiata, id. *l. c.* p. 347, Chili; *G. ada*, id. Ann. N. H. (5) ix. p. 91, Melbourne.

Hyperythra miegii, Mabille, Le Nat. ii. p. 135, Madagascar.

Endropia snelleni, Hedemann, Hor. Ent. Ross. xvi. p. 46, pl. x. fig. 1, Askold.

Tetracis edmondsi, Butler, Tr. E. Soc. 1882, p. 349, Valdivia.

Sabulodes infelix, id. *l. c.* p. 350, Chili.

Pericallia parva, Hedemann, *l. c.* p. 45, Amur.

Paragonia arenosa, p. 351, *squamosa*, *turbida*, p. 352, *carnea*, p. 353, var. (?) *rosea*, and *P. cinerea*, p. 354, Butler, *l. c.*, Chili.

Azelina felderi, pl. xvi. fig. 5 (= *Colotois ? chilenaria*, Feld. & Rog., ♀), and *A. corticalis*, id. *l. c.* p. 355, Chili; *A. albo-macularia* and *arizonaria*, H. Edwards, Papilio, ii. p. 130, Arizona.

Odontopera fragilis, Butler, *l. c.* p. 356, Chili.

Eugonia vidularia, Grote, Canad. Ent. xiv. p. 173, Arizona.

Monoctenia dentilineata, Butler, *l. c.* p. 358, pl. xvi. fig. 12, Chili.

Hemerophila serraria, Costa, Atti Acc. Nap. ix. (6) p. 41, fig. 13, Calabria.

Boarmia buettneri, Hedemann, *l. c.* p. 54, pl. x. fig. 6, Amur; *B. repetita*, Butler, Ann. N. H. (5) x. p. 232, Duke of York Island.

Cymatophora (*Boarmia*) *dataria*, Grote, Canad. Ent. xiv. p. 173, Arizona.

Lycauges (?) *angulata*, Butler, *l. c.* p. 233, New Britain.

Hypochroma sublimbata, id. *l. c.* p. 232, Duke of York Island; *H. edmondsi*, Tr. E. Soc. 1882, p. 364, Chili.

Honorana ænea, id. *l. c.* p. 365, Chili.

Chlorochroma vulnerata, id. Ann. N. H. (5) ix. p. 91, Melbourne.

Omphax gnoma, id. Tr. E. Soc. 1882, p. 367, Chili.

Boletobia sericea, id. *l. c.* p. 367, Chili.

Comibæna nivisparsa, id. Ann. N. H. (5) x. p. 232, Duke of York Island.

Byssodes cerussaria, Grote, Papilio, ii. p. 101; *B. obrussata*, id. Canad. Ent. xiv. p. 111, Florida.

Ephyra semirosea, *notigera*, and *umbrata*, Butler, Tr. E. Soc. 1882, p. 368, Valparaiso.

Sylleris lucida, id. *l. c.* p. 370, Valparaiso.

Acidalia squalidaria, Staudinger, S. E. Z. xliii. p. 405, E. Spanish Pyrenees; *A. roseo-fasciata*, Christoph, Hor. Ent. Ross. xvii. p. 114, Russian Armenia; *A. dohlmanni*, Hedemann, *l. c.* p. 257, Amur.

Marmopteryx sponsata, Grote, Canad. Ent. xiv. p. 215, New Mexico; *M. seiferti*, Neumoegen, Papilio, ii. p. 135, Arizona.

Thamnonoma quadraria, Colorado, and *perpallidaria*, New Mexico, Grote, *l. c.* p. 185.

Semiothisa (*Macaria*) *graphata*, Hedemann, *l. c.* p. 51, pl. x. fig. 4, Amur.

Pharmacis trinotata and varr. *subocellata*, p. 372, and *horrens*, p. 373, *P. clara*, p. 374, *mixta*, and varr. *seriata* and *melanosticta*, p. 375, and *columba*, p. 376, *P. ardescens*, p. 376, *latifasciata*, and var. *definita*, p. 377, *P. insignis*, p. 378, Butler, *l. c.*, Chili.

Tephrina lapidea, p. 378, *varians*, p. 379, var. *conigera*, p. 380, and *T. canescens*, p. 381, *id. l. c.* 1882, Chili.

Psammatodes cauquenensis, id. *l. c.* p. 382, Chili.

Liodes venata, id. *ibid.*, Chili.

Ochyria ignipennis, id. *l. c.* p. 386, Chili.

Spartopteryx (?) *denticulata*, id. *l. c.* p. 387, Chili.

Lozogramma ceres and *butyrosa*, id. *l. c.* p. 383, Chili.

Panagra cavifasciata and *signistriata*, id. *l. c.* p. 384, Chili.

Selidosema phasma, id. *l. c.* p. 385, Chili.

Fidonia edmondsi, id. *ibid.*, Valparaiso.

Lythria cenustata, Staudinger, S. E. Z. xliii. p. 64, Saisan; *L.* (?) *fultaria*, Grote, *l. c.* p. 174, Arizona.

Tornos interruptaria, p. 185, *escaria*, *ochro-fuscaria*, p. 186, *id. l. c.*, Arizona.

Chloraspilates arizonaria, id. Papilio, ii. p. 80 (Arizona?).

Aspilates siecersi, Christoph, Hor. Ent. Ross. xvii. p. 115, Russian Armenia; *A. lacticinia* and *bivittata*, Butler, *l. c.* p. 388, Valparaiso.

Euschema sagana, Druce, P. Z. S. 1882, p. 781, pl. lxi. fig. 3, Cochin China; *E. lunulata*, Butler, Ann. N. H. (5) x. p. 375, Tenesserim.

Heleona tyrianthina, id. *l. c.* p. 231, Duke of York Island.

Bacillogaster boreas and *parva*, id. Tr. E. Soc. 1882, pp. 391 & 392, Valparaiso.

Anisopteryx bistriata, Hedemann, *l. c.* p. 53, pl. x. fig. 5, Vladivostok.

Chimatobia myricaria, N. Cooke, Ent. xv. p. 57, Keswick; *C. aleucidia*, Butler, *l. c.* p. 407, Chili.

Oporobia martha and *hastigera*, id. *l. c.* pp. 393 & 394, Chili.

Larentia chillanensis, id. *l. c.* p. 395, Chili.

Hammaptera chiloena, id. *ibid.* Chili.

Amathia indistincta, id. *l. c.* p. 397, Chili.

Pachrophylla varians, p. 400, *minor*, p. 401, and varr. *fasciata* and *fumosa*, p. 402, *id. l. c.*, Chili.

Eupithecia lepsaria, Lepsa, *saisanaria*, Saisan, *nobilitata*, Lepsa, *leptogrammata*, Saisan, and *exactata*, Saisan, Staudinger, S. E. Z. xliii. pp. 74–78; *E. gypsata*, Grote, Canad. Ent. xiv. p. 188, Arizona; *E. anone*, *frequens*, p. 404, *rosalia*, *sibylla*, and *usta*, p. 405, Butler, *l. c.*, Chili.

Helastia corralensis, id. *l. c.* p. 406, Chili.

Rheumaptera immediata, Grote, *l. c.* p. 184, New York.

Hydriomene reflata, id. *l. c.* p. 186, Arizona.

Thera confusa, Butler, *l. c.* p. 407, Chili.

Glaucopteryx aurata, Grote, *l. c.* p. 186 (Arizona ?).

Hypsipetes cinerea and *pastoralis*, Butler, *l. c.* p. 408, Chili.

Anticlea corticalis, id. *l. c.* p. 411, Chili.

Coremia decipiens, id. *l. c.* p. 412, Chili.

Camptogramma (?) *dubia*, id. *l. c.* p. 413, Valparaiso.

Phibalopteryx edna and *jacintha*, id. *l. c.* p. 414, Chili.

Scotosia exacta and *cauquenensis*, id. *l. c.* p. 415, Chili.

Triphosa incertata, Staudinger, S. E. Z. xliii. p. 67, Saisan, &c.; *T. oberthueri*, Hedemann, *l. c.* p. 264 [err. p. 248] pl. xiii. fig. 5, Amur.

Eucosmia varia, pl. x. fig. 7, Askold, Japan, p. 55, and *christophi*, pl. xiii. fig. 4, Amur, p. 265 [err. p. 249], *id. l. c.*

Cidaria haasi, id. *l. c.* p. 268 [err. p. 252] pl. xiii. fig. 9, Amur; *C. tauaria*, Ala Tau, p. 70, *intersecta*, p. 71, and *intricata*, Saisan, p. 73, Staudinger, l. c.; *C. emilia*, *misera*, p. 415, *diana*, and varr. *cynthia* and *luna*, p. 416, and *C. ceres*, Chili, p. 417, Butler, *l. c.*, Chili.

Psaliodes signata, p. 418, *udohalia* and *brevipalpis*, p. 419, *id. l. c.* Chili.

Chalastra (?) *pusilla*, id. *l. c.* p. 420, Valparaiso.

Docirava (?) *chilensis*, id. *l. c.* p. 420, Chili.

Orthollitha junctata, Staudinger, *l. c.* p. 65, Central Asia.

Eubolia linda, Butler, Ann. N. H. (5) ix. p. 96, Melbourne.

Phyllia cinerescens, id. Tr. E. Soc. 1882, p. 421, Valparaiso.

Sarracena olivacea, id. *l. c.* p. 421, Valparaiso.

Siona columba, id. *l. c.* p. 422, Chili.

Heterophleps ophiusina, *agitata*, p. 423, *stygiana*, p. 424, and var. *aurea*, p. 425, *id. l. c.*, Chili.

Pyralidæ.

Short notes on various *Pyralidæ* ; Sorhagen, B. E. Z. xxvi. pp. 145–151. Ditto of Massachusetts ; Grote, Papilio, ii. pp. 72–74.

Asopia costalis noticed as injurious to clover ; Saunders, Rep. E. Soc. Ont. 1881, pp. 45 & 46, fig. 18.

Hypotia corticalis, W. V. Larva noticed ; Von Nolcken, S. E. Z. xliii. p. 179.

Rhodaria despecta, Butl. Larva described ; Blackburn, Ent. M. M. xix. p. 56.

Ennychia anguinalis. Natural history ; Buckler, Ent. M. M. xix. pp. 77–79.

Hercyna helveticalis, Herr.-Schäff., and *lugubralis*, Led., are distinct ; Zeller, JB. Ges. Graub. xxv. p. 24.

Agrotera nemoralis noticed from Java ; Snellen, Tidjschr. Ent. xxv. p. cxxvii.

Endotricha flammealis : natural history ; Buckler, *l. c.* pp. 149–154. Transformations described ; Heylaerts, CR. Ent. Belg. xxvi. pp. cxli. & cxlii.

Tetralopha diluculella, Grote, noticed by him as destructive to pine ; Bull. U. S. Geol. Surv. vi. p. 589.

Botis. Additions to list of N. American species ; *id. l. c.* p. 577.

Pionea stramentalis. Life-history ; Buckler, *l. c.* pp. 126–130.

Scopula lutealis and *prunalis*. Larvæ differentiated ; Porritt, Ent. M. M. xviii. p. 189.

New genera and species :—

Metrea, Grote, Papilio, ii. p. 73. Type, *M. ostreonalis*, sp. n., *l. c.* p. 73, Massachusetts and New York.

Fenaria, id. *l. c.* p. 132. Allied to *Chrysauge* ; type, *F. sevorsa*, sp. n., *l. c.*, Arizona.

Mestolobes, Butler, Tr. E. Soc. 1882, p. 37. Allied to *Phryganodes* and *Godara* ; type, *M. œnone*, l. c. p. 37, fig. ; add *M. simæthina* and *semiochrea*, pp. 38 & 39, spp. nn., Hawaiian Islands.

Noctuelia plebeialis, Christoph, Hor. Ent. Ross. xvii. p. 118, Russian Armenia.

Hypotia proximalis, id. *l. c.* p. 116, Russian Armenia.

Stemmatophora gadesialis, Ragonot, Bull. Soc. Ent. Fr. (6) ii. p. lxv. Cadiz.

Pharambara aurata, Butler, Ann. N. H. (5) x. p. 233, New Britain.

Microsca cuprea, id. *l. c.* p. 234, New Britain.

Pyrausta viola, id. *ibid.*, Duke of York Island.

Rhodaria robina, id. *l. c.* (5) ix. p. 96, Melbourne.

Anthophilodes concinnalis, Christoph, *l. c.* p. 120, Russian Armenia.

Desmia perfecta, Butler, *l. c.* x. p. 234, New Britain and Duke of York Island.

Asopia angusta, id. *l. c.* p. 234, Duke of York Island.

Metasia ochro-fascialis, Christoph, *l. c.* p. 121, Russian Armenia ; *M.* (?) *abnormis*, Butler, Tr. E. Soc. 1882, p. 35, Honolulu.

Scotomera hydrophila, id. *l. c.* p. 36, Hawaiian Islands.

Hydrocampa stenioides, id. Ann. N. H. (5) x. p. 235, Duke of York Island.

Stegothyris picata, id. *ibid.*, New Britain.

Glyphodes lachesis, id. *ibid.*, Duke of York Island.

Morocosma polybapta, id. *l. c.* p. 236, Duke of York Island.

Margaronia plumifera, id. *l. c.*, New Britain.

Hoterodes regalis, id. *l. c.* p. 236, New Britain.

Botys amplipennis and *perfenestrata*, id. *l. c.* p. 237, New Britain; *B. flavo-fascialis*, New Mexico, and *washingtonalis*, Washington Territory, Grote, Bull. U. S. Geol. Surv. vi. pp. 577 & 578.

Scopula constricta, Butler, Tr. E. Soc. 1882, p. 40, Honolulu.

Crambidæ.

Meyrick, E. Descriptions of Australian *Microlepidoptera*. ii. *Crambites* (continued). P. Linn. Soc. N. S. W. iv. pp. 205–242. [Omitted from Zool. Rec. xvi.]

Supplementary to the paper mentioned in Zool. Rec. xvi. *Ins.* p. 181. The writer remarks on the almost universal generic identity of Australian *Crambites* with European, with an equally general absence of specific identity. In the case of the *Gelechiidæ* and *Œcophoridæ*, on the other hand, by far the larger proportion of the Australian genera are endemic. The following known species are noticed:—*Chilo parramattellus*, Meyr.; *Ancylolomia westwoodi*, Zell.; *Prionophora ruptella*, Walk., is a *Geometra*; *Crambus bifractellus*, *infractellus*, and *plumiferellus*, Walk. (= *aurosus*, Feld. & Rog.), *longipalpellus*, Meyr., *relatalis*, Walk., *grammellus*, Zell., *perlatalis*, Walk., *enneagrammus*, Meyr., *argyroneurus*, Zell., *Eromene præmaturella* and *dilatella*, Meyr., are broods, and belong to *Diptycophora*, Zell., *Pempelia strigiferella*, Meyr., *Eucarphia vulgatella*, Meyr.; *Myelois subarcuella* and *cosmiella*, Meyr., referred to *Euzophora*; *Anerastia mirabilella*, Meyr., *Ephestia ficulella*, Barr., *sericaria*, Scott, and *Aphomia latro*, Zell. A list of all the species mentioned in this and the preceding paper is added.

Zeller, P. C. Columbische Chiloniden, Crambiden, und Phyciden. Hor. Ent. Ross. xvi. pp. 154–256, pls. xi. & xii.

The following known species, chiefly Zeller's, are specially mentioned, in addition to the new ones:—*Diatræa neuricella*, p. 162, *obliteratella* (? = *sacchari*, Guild.), figs. 5*a* & *b*, p. 163; *Crambus immunellus*, p. 170, *expansellus*, p. 171, *incanellus*, p. 173, *quadrinotellus*, p. 174; *Argyria opposita*, *pontiella*, p. 175, *insella* and *simplex*, p. 176; *Etiella zinckenella*, Treitschke; *Pempelia rubedinella*, fig. 12, p. 181; *Oncolabis anticella*, figs. 14*a* & *b*, p. 185, pl. xi.; *Fundella pellucens*, pl. xii. figs. 41*a* & *b*, p. 236.

Meyrick (P. Linn. Soc. N. S. W. vii. pp. 148–172) gives a synopsis of the *Crambidæ*, which he divides into the following families:—*Schænobiadæ*, *Crambidæ* (including *Chilo*), *Phycidæ*, and *Galleridæ*. The following synonymy occurs:—*Crambus trivittatus*, Zell., Meyr., = *Thysanotia bivittella*, Don., and *C. bivittellus*, Zell., Meyr., = *T. recurvella*,

Walk.; *C. argyroneurus*, Zell., = *T. relatalis*, Walk.; *C. enneagrammus*, Meyr., = *grammellus*, Zell.; *C. concinnellus*, Walk., = *C. hapaliscus*, Zll.; *Pempelia opinella*, Meyr., is doubtful as belonging to the genus.

Short notes on various *Crambidæ* of Massachusetts; Grote, Papilio, ii. pp. 72–74.

List of New Zealand *Crambidæ* (*Galleriidæ* and *Phycidæ* are wholly absent); Meyrick, N. Z. J. Sci. i. pp. 186 & 187.

Meyrick's descriptions of New Zealand *Microlepidoptera* reprinted; *l. c.* pp. 32–35, 136–138, 159–165, 208–211.

Notes on various *Crambidæ*, including descriptions of larvæ of the following species:—*Myelois ceratomiæ*, Zell., *Nyctigretis achatinella*, Hübn., *Euzophera terebrella*, Zinck., *pinguis*, Haw., and *interpunctella*, Hübn.; Sorhagen, B. E. Z. xxvi. pp. 151–158.

Von Nolcken notices the larvæ, variation, &c., of *Pempelia gallicola*, Staud., *Acrobasis porphyralis*, Dup., *A. obliqua*, Zell., and *Ephestia gnidiella*, Mill.; S. E. Z. xliii. pp. 180–182.

Acrobasis fallouella, Pey., *Myelois epelydella*, var. *lugens*, *Homœosoma* sp., and other *Phycidæ* from Amasia, noticed; Staudinger, Hor. Ent. Ross. xvi. pp. 88 & 89.

Scoparia muralis: larva described; Porritt, Ent. xv. pp. 183 & 184. *S. coarctata*, Zell., var. (?) *montana* from Honolulu, described; Butler, Tr. E. Soc. 1882, p. 41.

Galleria cerella: larva described; Porritt, *l. c.* p. 117.

Melissoblaptes anellus, W. V. (*bipunctanus*, Zell.), discussed; Sorhagen, B. E. Z. xxvi. pp. 159 & 160.

Epischnia (*Anerastia*) *farrella*, Curt.: Stainton brings together various notices; Ent. M. M. xviii. pp. 217–219.

Ephestia passulella: natural history; Buckler, Ent. M. M. xix. pp. 104–106. It is double-brooded; Porritt, *tom. cit.* p. 142.

Acrobasis consociella, Hübn., var. *sodalella* noticed from Pembrokeshire; Barrett, *l. c.* p. 111.

Myelois xanthotriche, Staud. (confounded by Von Nolcken with *ceratomiæ*, Zell.), discussed and redescribed; Von Nolcken, S. E. Z. xliii. pp. 517–525.

Etiella zinckenella, Treitschke: transformations described; Piccioli, Bull. Ent. Ital. xiv. pp. 147–150.

Megaphycis, Grote: this genus (types, *Phycis bolli*, Zell., and *dentata*, Grote) is quite distinct from *Zophodia*, Hübn.; Grote, Canad. Ent. xiv. p. 30.

Pempelia formosa: larva noticed; Stange, S. E. Z. xliii. p. 513. *P. lignosella*, Zell.: transformations described and figured; Riley's Rep. Ins. 1882, pp. 143–145, pl. vii. fig. 3.

Pinipestis, Grote: the labial palpi are ascending; Grote, *l. c.* p. 30. *P. zimmermanni*, Grote, noticed by him, Bull. U. S. Geol. Surv. vi. pp. 589 & 590.

Phycis caryæ, *angusella*, and *demotella*, Grote, noticed by him as destructive to hickory; *l. c.* p. 590.

Salebria contatella, Grote: larva noticed by him as destructive to locust tree; *ibid.*

Crambus vulgivagellus, Clem. : transformations described ; Riley, Rep. Ins. 1882, pp. 179–183, pl. x. fig. 2. Damage done by its larvæ to grass in New York in 1881 ; Lintner, P. Am. Ass. xxx. pp. 267 & 268, Rep. E. S. Ont. 1881, pp. 12 & 13.

Eromene bella, Hübn., recorded from Honolulu ; Butler, Tr. E. Soc. 1882, p. 42.

Schœnobiadæ [*-idæ*], fam. n., Meyrick, P. Linn. Soc. N. S. W. vii. p. 151. Labial palpi porrected ; maxillary palpi triangular, porrected, conspicuous ; fore-wings with twelve veins, 1 simple, 7 separate, 8 and 9 stalked ; hind-wings with eight veins, 3, 4, and 5, rising near together, not stalked, 7 and 8 stalked ; lower median not pectinated at base. To include *Scirpophaga*, Tr., *Schœnobius*, Dup., and *Erotomanes*, g. n.

New genera and species :—

Tetraprosopus, Butler, Ann. N. H. (5) ix. p. 97. Allied to *Scoparia* ; type, *T. meyricki*, sp. n., *ibid.*, Melbourne.

Callionyma, Meyrick, P. Linn. Soc. N. S. W. vii. p. 161. Allied to *Galleria* ; antennæ with a tooth of scales on basal joint, in ♂ very finely ciliated ; labial palpi in ♂ short, ascending, in ♀ rather long, porrected ; fore-wings with twelve veins, 8 and 9 stalked, rising out of 7 ; hind-wings with eight veins, 4 and 5, and 7 and 8 stalked. Type, *C. sarcodes*, sp. n., *l. c.* p. 172, New South Wales.

Schistotheca, Ragonot, Bull. Soc. Ent. Fr. (6) ii. p. clxxv. Allied to *Melissoblaptes (anellus)* ; palpi in ♂ small, in ♀ very long, slender, porrected, third joint curved ; wings of ♂ with a tuft of hairs at the end of the costal fold, placed obliquely across the basal extremity of the cell ; discoidal cell divided longitudinally in ♂. Type, *S. canescens*, sp. n., *ibid.*, Chili.

Pycnulia, Zeller, Hor. Ent. Ross. xvi. p. 186 [= *Idia* (?), Rog., *nec* Hübn.]. *Phycidæ* ; affinities uncertain ; differs from other genera by its short, triangular hind-wings, and nearly straight hind margin. Types, *P. ministra* (? = *scopipes*, Rog.) and *abrupta*, spp. nn., *l. c.* pp. 187 & 189, pl. xi. figs. 15*a*, *b* & 16*a*, *b*.

Mesodiphlebia, id. *l. c.* p. 251. *Anerastia*, sect. c ; palpi porrected ; median nervure of the hind-wings simply forked. Type, *A. crassivenia*, sp. n., *ibid.* pl. xii. figs. 52*a* & *b*, Colombia.

Trissonca, Meyrick, *l. c.* p. 158. (This and the following genera to *Eucampyla* inclusive, are placed between *Lasiocera*, Meyr., and *Homœosoma*, Curt.) Antennæ of ♂ finely ciliated, with three small projecting teeth above near base ; labial palpi moderate, curved, ascending ; maxillary palpi short, filiform ; fore-wings with eleven veins, 7 and 8 stalked ; hind-wings with seven veins, 3, 4, 6, and 7 stalked. Type, *Spermatophthora mesactella*, Meyr.

Ampycophora, id. *ibid.* Antennæ of ♂ dentate, ciliated, with a tuft of scales in the sinuation at base ; labial palpi moderate, curved, ascending ; maxillary palpi in ♂ pencil-like, in ♀ short, filiform ; fore-wings with ten veins, 6 and 7 stalked ; hind-wings as in last. Type, *Pempelia apotomella*, Meyr.

Heosphora, id. *ibid.* Antennæ of ♂ as in last ; labial palpi very long,

Crambus vulgivagellus, Clem. : transformations described ; Riley, Rep. Ins. 1882, pp. 179–183, pl. x. fig. 2. Damage done by its larvæ to grass in New York in 1881 ; Lintner, P. Am. Ass. xxx. pp. 267 & 268, Rep. E. S. Ont. 1881, pp. 12 & 13.

Eromene bella, Hübn., recorded from Honolulu ; Butler, Tr. E. Soc. 1882, p. 42.

Schœnobiadæ [*-idæ*], fam. n., Meyrick, P. Linn. Soc. N. S. W. vii. p. 151. Labial palpi porrected ; maxillary palpi triangular, porrected, conspicuous ; fore-wings with twelve veins, 1 simple, 7 separate, 8 and 9 stalked ; hind-wings with eight veins, 3, 4, and 5, rising near together, not stalked, 7 and 8 stalked ; lower median not pectinated at base. To include *Scirpophaga*, Tr., *Schœnobius*, Dup., and *Erotomanes*, g. n.

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Tetraprosopus, Butler, Ann. N. H. (5) ix. p. 97. Allied to *Scoparia* ; type, *T. meyricki*, sp. n., *ibid.*, Melbourne.

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Schistotheca, Ragonot, Bull. Soc. Ent. Fr. (6) ii. p. clxxv. Allied to *Melissoblaptes* (*anellus*) ; palpi in ♂ small, in ♀ very long, slender, porrected, third joint curved ; wings of ♂ with a tuft of hairs at the end of the costal fold, placed obliquely across the basal extremity of the cell ; discoidal cell divided longitudinally in ♂. Type, *S. canescens*, sp. n., *ibid.*, Chili.

Pycnulia, Zeller, Hor. Ent. Ross. xvi. p. 186 [= *Idia* (?), Rog., *nec* Hübn.]. *Phycidæ* ; affinities uncertain ; differs from other genera by its short, triangular hind-wings, and nearly straight hind margin. Types, *P. ministra* (? = *scopipes*, Rog.) and *abrupta*, spp. nn., *l. c.* pp. 187 & 189, pl. xi. figs. 15*a*, *b* & 16*a*, *b*.

Mesodiphlebia, id. *l. c.* p. 251. *Anerastia*, sect. c ; palpi porrected ; median nervure of the hind-wings simply forked. Type, *A. crassivenia*, sp. n., *ibid.* pl. xii. figs. 52*a* & *b*, Colombia.

Trissonca, Meyrick, *l. c.* p. 158. (This and the following genera to *Eucampyla* inclusive, are placed between *Lasiocera*, Meyr., and *Homœosoma*, Curt.) Antennæ of ♂ finely ciliated, with three small projecting teeth above near base ; labial palpi moderate, curved, ascending ; maxillary palpi short, filiform ; fore-wings with eleven veins, 7 and 8 stalked ; hind-wings with seven veins, 3, 4, 6, and 7 stalked. Type, *Spermatophthora mesactella*, Meyr.

Ampycophora, id. *ibid.* Antennæ of ♂ dentate, ciliated, with a tuft of scales in the sinuation at base ; labial palpi moderate, curved, ascending ; maxillary palpi in ♂ pencil-like, in ♀ short, filiform ; fore-wings with ten veins, 6 and 7 stalked ; hind-wings as in last. Type, *Pempelia apotomella*, Meyr.

Heosphora, id. *ibid.* Antennæ of ♂ as in last ; labial palpi very long,

straight, porrected, terminal joint concealed; maxillary palpi obsolete; fore-wings with ten veins, 7 and 8 stalked, rising out of 6; hind-wings as in last. Types, *Anerastia virginella* and *psamathella*, Meyr.

Crocydopora, id. *ibid.* Antennæ of ♂ as in last, finely ciliated; labial palpi rather long, stout, porrected, terminal joint short; maxillary palpi obsolete; fore-wings with ten veins, 6 and 7 stalked; hind-wings as in last. Type, *Nephopteryx stenopterella*, Meyr.

Hypophana, id. *l. c.* p. 159. Antennæ of ♂ as in last, very finely ciliated; labial palpi moderate, slender, recurved, ascending; maxillary palpi short, filiform; fore-wings with eleven veins, 7 and 8 stalked; hind-wings with eight veins, 4 and 5 stalked, sometimes arising out of 3, 7 and 8 stalked. To include *Nephopteryx euraphella*, *infusella*, and *Pempelia melanostyla* (cf. p. 170), Meyr., and *petalocosma*, sp. n., *l. c.* p. 169, Sydney.

Eucampyla, id. *l. c.* p. 159. Antennæ of ♂ finely ciliated with a short acute tooth on basal joint above; labial palpi moderate, slender, porrected; maxillary palpi short, filiform; fore-wings with eleven veins, 4 and 5, and 7 and 8 stalked; hind-wings with seven veins, 3 and 4 rising near together, 6 and 7 stalked. Type, *E. etheiella*, sp. n., *l. c.* p. 171, Sydney.

Cateremna, id. *l. c.* p. 156. Only differs from *Euzophera* in its being implied that veins 4 and 5 of the fore-wings are not stalked in *Cateremna*. To include *Euzophera leucarma* and *microdoxa*, and *Myelois subarcuella*, Meyr.

Hyperxena, id. *l. c.* p. 177. Allied to *Heliocosma*, Meyr.; vein 7 of fore-wings running to the costa; thorax crested; hind margin of fore-wings very oblique, and cilia long. Type, *H. scierana*, sp. n., *ibid.*, New South Wales.

Heterocrossa, id. *ibid.* To include *Epischnia neurophorella*, Meyr., *E. abruptella*, Walk., and *H. gonosemana*, sp. n., *l. c.* p. 179, New Zealand.

Pyla, Grote, New Check List, p. 35. Not characterized; placed after *Nephopteryx*. Type, *N. scintillans*, Grote.

Meroptera, id. Canad. Ent. xiv. p. 30. Differs from *Pempelia* in having eight instead of seven veins to the hind-wings; type, *P. pravella*, Grote.

Scenoploca, Meyrick, N. Z. J. Sci. i. p. 186. Allied to *Thisanotia*; palpi tufted; ♀ with abbreviated wings. Type, *S. petraula*, sp. n., *ibid.*, Christchurch, New Zealand.

Cryptonima, sp. n., *ibid.* Allied to *Thisanotia*; fore-wings with raised tufts of scales. Type, *Gadira acerella*, Walk.

Ptochostola, id. P. Linn. Soc. N. S. W. vii. p. 154. Allied to *Crambus*; antennæ of ♂ finely ciliated; labial palpi very long, attenuated; fore-wings with ten veins, 6 and 7 stalked, 6 [running ?] to below apex, 9 coalescing with 10 before costa; hind-wings with seven veins, 4 from angle of cell, 5 closely approximated at base to 6, 6 and 7 stalked; cell open. Type, *Crambus dimidiellus*, Meyr.

Erotomanes, id. *l. c.* p. 152. Allied to *Schœnobius*; antennæ of ♂ half as long as fore-wings, slender, pubescent; those of ♀ equally long; labial palpi much longer than head, broadly haired; abdomen in ♂ elongate, stout, in ♀ shorter, anal extremity laterally compressed, not tufted. Type, *Chilo mirabilella*, Meyr.

Crunophila, id. *ibid.* Allied to *Chilo*; antennæ of ♂ stout, strongly pectinated; labial palpi very long, attenuated; fore-wings with twelve veins, 8 and 9 stalked; hind-wings with eight veins, 4 and 5 rising from a point, 6 very closely approximated at origin to 7, 7 and 8 stalked; cell closed. Type, *Crambus remostriellus*, Walk. (= *Ubida receptalis*, Walk.) = *Chilo scistellus*, Meyr.), ♂ and variation noticed, *l. c.* p. 153.

Aphomia tripartitella, Sydney, and *pachytera*, Tasmania, Meyrick, P. Linn. Soc. N. S. W. iv. pp. 236 & 237.

Anerastia virginella, Queensland, *psamathella*, Sydney, *id. l. c.* pp. 233 & 234.

Ephestia unicolorella, Staudinger, Hor. Ent. Ross. xvi. p. 89, Amasia; *E. declivella*, fig. 47, Colombia, p. 244, *resticula*, fig. 48, Calcutta, p. 45, *simplicula*, fig. 49, p. 246, *commatella*, fig. 50, p. 247, and *parvula*, fig. 51, p. 249, Zeller, Hor. Ent. Ross. xvi. pl. xii., Colombia; *E. guttella*, Snellen, Tijdschr. Ent. xxv. p. 213, Java.

Euzophera compedella, fig. 34, p. 224, *quadripuncta*, fig. 35, p. 226, *cundajensis*, fig. 36, p. 227, *impeditella*, fig. 37, p. 229, *homœosomella*, fig. 38, p. 231, *disticta*, fig. 39, p. 232, and *impeltella*, fig. 40, p. 234, Zeller, *l. c.* pl. xii., Colombia; *E. leucarma*, Paramatta, and *microdoxa*, Tasmania, Queensland, Meyrick, *l. c.* pp. 230 & 231.

Homœosoma erronella, fig. 42, p. 238, *ubacensis*, fig. 43, p. 239, *maturella*, fig. 44, p. 240, *libertella*, fig. 45, p. 241, and *tenebricosa*, figs. 46*a*, *b*, p. 242, Zeller, *l. c.*, Colombia.

Myelois sericina, p. 192, *flavicans*, fig. 17, p. 193, *trichromata*, fig. 18, p. 194, *semirufella*, fig. 19, p. 196, *peterseni*, fig. 20, p. 198, *bigrana*, fig. 21, p. 200, *exoleta*, fig. 22, p. 201, *monosemia*, fig. 23, p. 203, *definitella*, fig. 24, p. 205, *guarinella*, fig. 25, pl. xi. p. 208, *ochrodesma*, and var. (?) *columnella*, fig. 26, p. 209, *laidion*, fig. 27, p. 211, *postica*, fig. 28, p. 213, *dasypyga*, figs. 29*a*, *b*, p. 215, *solitella*, fig. 30, p. 217, *famula*, fig. 31, p. 218, *restrictella*, fig. 32, p. 220, and *decolor*, fig. 33, pl. xii. p. 222, *id. l. c.*, Colombia; *M. anobarella*, Meyrick, *l. c.*, p. 228, Sydney, Paramatta.

Hypochalcia fasciatella, Staudinger, *l. c.* p. 87, Amasia.

Eucarphia neotomella and *cnephaella*, Meyrick, *l. c.* pp. 226 & 227, Paramatta.

Epischnia neurophorella, id. *l. c.* p. 232, Sydney.

Nephopteryx fallax, Staudinger, *l. c.* p. 83, Amasia; *N. fuscifrontella*, Zeller, *l. c.* p. 183, pl. xi. figs. 13*a*, *b*, Colombia; *N. euraphella*, Wollongong, p. 217, *infusella*, Queensland, p. 218, and *fornacella*, Paramatta, p. 219, Meyrick, *l. c.*

Etiella schisticolor, Zeller, *l. c.* p. 178, California.

Pempelia diffusa and *albistrigata*, Staudinger, *l. c.* pp. 85 & 86, Amasia; *P. diffissella* and *rubedinella*, Zeller, *l. c.* pp. 178 & 181, pl. xi. figs. 11 & 12, Colombia; *P. melanostyla*, Paramatta, p. 220, *caliginosella*, Sydney, p. 221, *oculiferella*, p. 222, *digrammella*, Paramatta, p. 223, *apotomella*, Queensland, p. 225, Meyrick, *l. c.*

Asarta zapateri, Ragonot, Bull. Soc. Ent. Fr. (6) ii. p. lxv., Aragon.

Salebria eucometis, Meyrick, *l. c.* p. 168, Brisbane.

Spermatophthora mesactella, id. *l. c.* p. 225, Paramatta.

Argyria argyraspis, id. *l. c.* p. 216, Bulli, &c.

Crambus dimorphellus, Amasia, and *confusellus* (= *incertellus*, Hein., *c.* Herr.-Schäff.), Bohemia, Staudinger, *l. c.* pp. 81 & 82; *C. leuconotus*, fig. 7, p. 167, *tenuistrigatus*, fig. 8, p. 168, *pygmæus*, fig. 10, Colombia, p. 173, and *ligonellus*, fig. 9, Jamaica, p. 170, Zeller, *l. c.* pl. xi.; *C. æthonellus*, *dicronellus*, *haplotomus*, *callir*[*r*]*hous*, *siriellus*, *cyclopicus*, *harpophorus*, and *xanthogrammus*, Meyrick, N. Z. J. Sci. i. p. 187; *C. apicistrigellus*, id. P. Linn. Soc. N. S. W. iv. p. 209, Paramatta, &c.

Chilo interlineatus, Colombia, p. 156, *densellus*, and *squamulellus*, Texas, p. 158, Zeller, *l. c.* pl. xi. figs. 1–3; *C. oryzæellus*, Riley, Rep. Ins. 1882, p. 135, pl. vii. fig. 1, Savannah; *C. leptogrammellus*, Sydney, Paramatta, and *C.* (?) *schistellus*, Paramatta, Meyrick, *l. c.* p. 207.

Diatræa pinosa, Zeller, *l. c.* p. 165, pl. xi. fig. 6, Colombia.

Scirpophaga exsanguis, Sydney, and *ochroleuca*, Queensland, Meyrick, *l. c.* pp. 161 & 162.

Donacoscaptes lanceolatus, Zeller, *l. c.* p. 159, pl. xi. fig. 4, Colombia.

Thisanotia argyroeles, Brisbane, p. 163, *panselenella*, Blue Mountains, p. 165, and *acontophora*, New South Wales, p. 167, Meyrick, l. c.; *T. leucophthalma*, id. N. Z. J. Sci. p. 186, Christchurch, New Zealand.

Diptychophora pyrsophanes, *chrysochyta*, *astrosema*, *leucoxantha*, p. 186, *h*[illegible]*ctypa* and *elaina*, p. 187, *id. l. c.*, New Zealand.

TORTRICIDÆ.

FERNALD, C. H. A Synonymical Catalogue of the described *Tortricidæ* of North America, north of Mexico. Tr. Am. Ent. Soc. x. pp. 1–72.

429 species enumerated; many identical with European species. Several new species are described, and very full localities are given. The following points are specially noticed:—*Teras trisignana*, Rob., probably = *boscana*, Fabr.; *pulverosana*, Walk., ? = *hastiana*, var.; *simpliciana*, Walsingh., probably = *ferrugana*, W. V.; *oxycoccana*, Pack., *cinderella*, Riley, *malivorana*, Le Baron, and *vaccinivorana*, Pack., are regarded by Riley as one species, but the first is certainly distinct; *Cacœcia obsoletana* and *transiturana*, Walk., are probably sexes; *Pandemis lamprosana*, Rob., appears to be distinct from *albaniana*, Walk., and *Lophoderus triferanus* and *velutinanus*, Walk., from *politanus*, Haw.; *nivcosanus*, Pack., is distinct from *osseanus*, Scop; *Tortrix albicomana*, Clem., = *bergmanniana*, L.; *Sericoris bipartitana*, Clem., is apparently distinct from *similisana*, Walk., *Padisca scudderiana*, Clem., is distinct from *cynosbana*, Fabr. The *Tortricidæ* are divided into two subfamilies, *Tortricinæ* and *Grapholithinæ*, but no characters are given.

WACHTL, A. Die Weisstannen-Triebwickler, *Tortrix murinana*, Hübn., *Steganoptycha rufimitrana*, Herr.-Schäff., und ihr Auftreten in den Forsten von Nieder-Oesterreich, Mähren und Schlesien, während des letz-abgelaufenen Decenniums. (MT. forstl. Versuchswesen Oesterreichs.) Wien: 1882, 4to, pp. 46, pls. xii. (partly coloured), and five tables.

A monograph on the White Pine and its enemies, especially *Tortrix murinana*, Hübn.; its var. *immaculana*, Wachtl, and *Steganoptycha rufimitrana*, Herr.-Schäff. Other *Tortrices* described as attacking the tree, are

T. (*Lozotænia*) *piceana*, Linn., *T.* (*Pandemis*) *ribeana*, Hübn., *Grapholitha* (*Pædisca*) *proximana*, Herr.-Schäff., *G.* (*P.*) *nigricana*, Herr.-Schäff., *Retinia margaritana*, Herr.-Schäff., *Grapholitha* (*Semasia*) *pactolana*, Zell., and *duplicana*, Zett., and *Tortrix* (*Lozotænia*) *histrionana*, Frön.

Captures of Tortrices in North Devon; South, Ent. xv. pp. 58–60.

Notes on the following rare Tortrices which occur at Merton, in Norfolk: — *Pædisca proximana*, *nigricana*, and *Steganoptycha rufimitrana*, Herr.-Schäff., *Grapholitha erectana*, Barrett, and *Phthoroblastis ochsenheimeriana*; Walsingham, Tr. Norw. Soc. iii. pp. 313–317.

Teras lipsiana, W. V., larva noticed; *schalleriana*, L., var. *latifasciana* from Hamburg described; *ferrugana*, Treitschke, larva described; *podana*, Scop., var. (?) *sauberiana*, from Hamburg described; *Tortrix lafauriana*, Rag., redescribed; *Cochylis schreibersiana*, Frön.; *Grapholitha bilunana*, Haw., *Semasia aurana*, F., *Carpocapsa grossana*, Haw., larvæ described; *Steganoptycha corticana*, Hübn., varr. *nigricans* and *steiniana* from Germany described; and *fractifasciana*, Haw., larva described. Many notes on the localities and food-plants of other species likewise occur; Sorhagen, B. E. Z. xxvi. pp. 129–143.

Von Nolcken notices the larvæ, variation, &c., of several Tortrices from Cannes; S. E. Z. xliii. pp. 182–186.

List of *Tortrices* of New Zealand; Meyrick, N. Z. J. Sci. i. pp. 277 & 278.

Grapholitha cinerana, Haw., and *Phtheochroa rugosana*, Hübn. Larvæ described; Barrett, Ent. M. M. xix. pp. 58 & 59.

Dichelia sulphureana, Clem., and *Teras ferrugana*, W. V. Transformations described; Packard, Papilio, ii. p. 182.

Conchylis mussehliana, Tr., and *Grapholitha rufilana*, Walk. Larvæ noticed; Stange, S. E. Z. xliii. p. 513.

Penthina sellana and *gentiana*, Hübn., discussed; Stendel, JH. Ver. Württ. xxxviii. pp. 170 & 171.

Amorbia humerosana, Clem. Larva described; Goodell, Papilio, ii. p. 187.

Œnophthira pilleriana discussed; Jolicœur, CR. Assoc. Fr. ix. pp. 1060–1063.

Œnestra pilleriana. Larva described; Barrett, *l. c.* pp. 135 & 136.

Tortrix lafauriana, Rag., noticed; *id. l. c.* xviii. p. 260. *T. vitiesana* and *angustiorana* popularly described and figured; Westwood, Gard. Chron. (2) xviii. pp. 405 & 524. *T. favillaceana*: larva described; Heylaerts, CR. Ent. Belg. xxvi. p. cxlii. *T.* (*Cacœcia*) *rosaceana*, Harr., feeds on *Betula populifolia*; Packard, Papilio, ii. pp. 182 & 183.

Pædisca scudderiana, Clem., a gall-maker; Kellicott, Canad. Ent. xiv. pp. 161–163.

Catoptria expallidana. Larva described; Wood, Ent. M. M. xix. pp. 140 & 141.

Argyrolepia schreibersiana noticed; Raynor, Ent. M. M. xix. p. 44.

Dicrorampha distinctana, Hein., recorded as new to Britain; South, Ent. xv. p. 110. *Cf.* also Barrett, *l. c.* xviii. p. 278.

Retinia duplana of British authors probably = *turionella*, var.; Barrett, *l. c.* xix. p. 136.

Lobesia botrana. Transformations described and figured; it is an imported species in N. America: W. Saunders, Canad. Ent. xiv. pp. 179–180, fig. 21.

Carpocapsa pomonella, L., discussed; Bethune, Rep. E. Soc. Ont. 1881, pp. 76 & 77, fig. 44 (gallery).

Asthenia scopariana, Herr.-Schäff., feeds on flowers of *Genista tinctoria*; Barrett, *l. c.* xviii. p. 278.

Sericoris, sp. Habits and transformations noticed; E. W. Claypole, Rep. E. Soc. Ont. 1881, pp. 13 & 14.

Sericoris instrutana, Clem. Life-history; *id.* P. Am. Ass. xxx. pp. 269 & 270.

Arotophora ochraceella, Walk., redescribed; Meyrick, P. Linn. Soc. N. S. W. vii. p. 175.

Carposina, Herr.-Schäff., belongs to the *Tortrices*; id. Ent. M. M. xix. pp. 69 & 70.

Bondia nigella, Newm. Genus and species redescribed, and referred to the *Tortrices*; id. P. Linn. Soc. N. S. W. vii. pp. 180–182.

New genera and species :—

Proteoteras, Riley, Tr. Ac. St. Louis, iv. p. 321, and Am. Nat. xvi. p. 913. Allied to *Proteopteryx*, but fore-wings with tufts of raised scales above, and hind-wings in ♂ with a large pencil or tuft of hairs above, between the margin and the costal vein; type, *P. æsculana*, sp. n., *l. c.*, Missouri; add *P. claypoleana*, sp. n., *id.* Am. Nat. xvi. p. 914, Ohio.

Melissopus, id. *l. c.* p. 322. Allied to *Ecdytolopha*; no scutellar tuft, inner margin of hind-wings with a mat of spatulate hairs, hind tibiæ and tarsi broad and bristly. Type, *Carpocapsa latiferreana*, Wals., ♂ described, *l. c.*

Harmologa, Meyrick, N. Z. J. Sci. i. p. 277. Characters of *Proselena*, but with a costal fold. To include *Teras oblongana*, Walk., *T. ænea*, Butl., *amplexana*, Zell., *sisyrana*, and *zatrophana*, spp. nn., *l. c.*, New Zealand.

Prothelymna, id. *l. c.* Allied to *Proselena*, but antennæ with fascicles of long, fine cilia. Type, *P. nephelotana*, sp. n., *l. c.* p. 278, New Zealand.

Protithona, id. *l. c.* p. 278. Placed after *Carpocapsa*; antennæ entire, (?) fore-wings with costal fold and twelve separate veins; hind-wings with seven separate veins. Type, *P. fugitivana*, sp. n., *l. c.*, New Zealand.

Exoria, id. *l. c.* Differs from last by the costa of fore-wings being simple; type, *E. mochlephorana*, sp. n., *l. c.*, New Zealand.

Brachytænia woodiana, Barrett, Ent. M. M. xviii. p. 185, Herefordshire.

Œnectra flavibasana, Fernald, Tr. Am. Ent. Soc. x. p. 69, Texas, Illinois.

Cenopis groteana, Ohio, and *quercana*, New York, Missouri, Texas, id. *l. c.*

Penthina costimaculana, Maine, Massachusetts, and *interrupto-lineana*, New Hampshire, Massachusetts, *id. l. c.* p. 70.

Tortrix alleniana, Maine, and *semicirculana*, Colorado, *id. l. c.* p. 68; *T. demiana*, Meyrick, N. Z. J. Sci. i. p. 277, New Zealand.

Exartema monetiferanum, Alabama, and *ferrugineanum*, St. Louis, Riley, Tr. Ac. St. Louis, iv. p. 317.

Padisca giganteana, Kansas, Iowa, and *celtisana*, Texas, *id. l. c.* pp. 318 & 319.

Phthoroblastis selectana, Christoph, Bull. Mosc. lvi., 4, p. 426, Vladivostok.

Proteopteryx walsinghami, Butler, Tr. E. Soc. 1882, p. 43, Honolulu.

Steganoptycha rasdolniana, Rasdolny, and *exquisitana*, Vladivostok, Christoph, *l. c.* pp. 427 & 428; *S. claypoleana* (Fern., MS.), Claypole, Psyche, iii. pp. 364–367, Ohio.

Phoxopteryx partitana, Christoph, *l. c.* p. 430, Amur; *P. goodelliana*, Fernald, *l. c.* p. 69, Maine, New Hampshire, Massachusetts; *P. murtfeldtiana*, Missouri, and *cornifoliana*, Kansas, Riley, *l. c.* pp. 323 & 324.

Teras maculipunctana, Costa, Atti Acc. Nap. ix. (11) p. 39, Sardinia; *T. ferruginiguttana*, Colorado, *chalybeana*, Maine, New York, *cervinana*, Massachusetts, Georgia, p. 65, *americana*, Massachusetts, California, and *fishiana*, Maine, p. 66, Fernald, l. c.; *T. illepida*, Butler, *l. c.* p. 42, Honolulu.

Semasia ferruginana, and *clavana*, Fernald, *l. c.* p. 72, Massachusetts, &c.; *S. helianthana*, Riley, *l. c.* p. 319, Texas.

Grapholitha tenebrana, Askold, p. 406, *rimosana*, p. 407, *semirufana*, p. 408, *expressana*, p. 409, *contrasignata*, p. 411, *opulentana*, p. 413, *teliferana*, p. 415, *flavipunctana*, p. 416, Vladivostok, *implicatana*, Raddefka, p. 417, *gradana*, Amur, p. 419, *mundana*, p. 420, *scintillana*, p. 421, *generosana*, Raddefka, p. 423, and *contrariana*, Vladivostok, p. 424, Christoph, l. c.; *G. gallæ-saliciana*, St. Louis, and *olivaceana*, Illinois, Riley, *l. c.* p. 320.

Conchylis ænotherana, Missouri, and *erigeronana*, Texas, *id. l. c.* p. 316; *C. thetis*, Melbourne, and *C.* (?) *auriceps*, Sydney, Butler, Ann. N. H. (5) ix. pp. 98 & 99, note.

Sericoris albiciliana, Fernald, *l. c.* p. 70, Maine.

Eudemis cinerariæ (= *quaggana*, Mill., *nec* Mann.), Von Nolcken, S.E.Z. xliii. pp. 183–185, Cannes; *E. lascivana*, Christoph, *l. c.* p. 405, Vladivostok.

Eccopsis olivaceana, Massachusetts, Pennsylvania, *atrodentana*, Ontario, Ohio, Texas, *corylana*, White Mountains, p. 71, and *malana*, New York, Illinois, p. 72, Fernald, l. c.; *E. footiana* (Robinson, MS.), *id.* Bull. Buff. Soc. iv. p. 52, New York, Pennsylvania.

Lophoderus quadrifasciana [*nus*], United States, *mariana*, Maine, Massachusetts, New York, and *coloradana* [*-nus*], Colorado, *id.* Tr. Am. Ent. Soc. x. p. 67.

Pyrgotis zygiana, Meyrick, N. Z. J. Sci. i. p. 277, New Zealand.

Adoxophyes lotinana, id. *ibid.*, New Zealand.

Proselena aspistana and *hemionana*, id. *l. c.*, New Zealand; *P. camacinana*, id. P. Linn. Soc. N. S. W. vii. p. 172, Australia, Tasmania.

Cacœcia psapharana, id. *l. c.* p. 174, Tasmania; *C. enoplana*, id. N. Z. J. Sci. i. p. 277, New Zealand.

Arotrophora hemerana, id. P. Linn. Soc. N. S. W. vii. p. 176, Tasmania.

Bondia dissolutana, p. 182, *maleficana* and *attenuatana*, p. 183, *id. l. c.* Australia.

TINEIDÆ.

CHAMBERS, V. T. On the Antennæ and Trophi of Lepidopterous Larvæ. J. Cincinn. Soc. v. pp. 5–21, pls. A–C.

In *Phyllocnistis*, *Lithocolletis*, *Leucanthiza*, *Coriscium*, *Gracilaria*, and *Ornix*, the trophi are imperfect in the young larvæ, all the palpi and the spinneret being absent, and the maxillæ either absent, or, in *Ornix* and *Gracilaria*, present in a very rudimentary form. At the first, or at a subsequent moult, all the mouth-organs become visible, though some of them are still in a very rudimentary condition in *Lithocolletis* and *Phyllocnistis*. The minute description of the separate organs and the remarks on the habits of the larvæ are too long to quote.

CHOLODKOWSKY, N. Zur Anatomie der *Tinea pellionella*. Zool. Anz. v. pp. 262–264.

Relates to the male sexual organs. The insect is remarkable for possessing only two Malpighian vessels, a structure hitherto observed among insects only in certain *Coccidæ*.

MEYRICK, E. Descriptions of Australian *Microlepidoptera*. iii. *Tineina*. P. Linn. Soc. N. S. W. v. pp. 132–182. [Omitted from Zool. Rec. xvii.]

Relates to *Gracilariidæ*, *Lithocolletidæ*, and *Lyonetiidæ*. The genera belonging to them and the species belonging to them are tabulated, and the following known species noticed and generally redescribed:—*Lithocolletis lalagella*, Newm., is a *Gracilaria*; *Gracilaria plagata*, *calicella*, *formosa*, and *albo-marginata*, Staint.; *Bedellia somnulentella*, Zell.; *Gracilaria terminella*, Walk., is one of the *Elachistidæ*; *G. arenosella*, Walk., belongs to *Batrachedra*.

WALSINGHAM [LORD]. North American *Coleophoræ*. Tr. E. Soc. 1882, pp. 429–442, pl. xvii.

In addition to several new species, several cases are described, some apparently belonging to the European *C. cæspitiella* and *currucipennella*, Zell., and ? *annulatella*, Tengstr. *C. rufoluteella*, Chamb. (case), is also noticed and figured (fig. 18).

On the use of the terms *Tineidæ* and *Tineina*; Walsingham & Chambers, Papilio, ii. pp. 77–79 & 115–119.

Short notes on various *Tineina* found at Witherslack; Threlfall, Ent. M. M. xix. pp. 112–114.

On setting *Microlepidoptera*; Snellen, Tijdschr. Ent. xxv. pp. vi.–viii.

Von Nolcken (S. E. Z. xliii. pp. 186–199) remarks on the larvæ, &c., of various *Tineæ* observed at Cannes, and more especially the following:—*Tinea inquinatella*, Zell., supposed ♂ described; *Crynopteryx familiella*, Mill., habits of larva; *Depressaria putridella*, W. V., *Lita halymella*, Mill., structure, &c.; *Mesophleps corsicellus*, Herr.-Schäff., variation; *Pyroderces argyrogramma*, Zell., larva described; *Butalis*, sp. n. (?), *Elachista dispunctella*, Dup., *Nepticula suberis*, Staint. & N., sp. n. (?).

Meyrick (P. Linn. Soc. N. S. W. vii. pp. 184–202) notices the following

known Australian species :—*Hypertropha thesaurella*, Meyr., = *Orosana desumptana*, Walk. ; *Eupselia bentella*, Meyr. (*nec* Walk.), *O. carpocapsella*, Walk., *Glyphopteryx triselena*, Meyr., redescribed; *Eschatotypa melichryseu*, Meyr., = *Tinea derogatella*, Walk., *Gracillaria ida*, *alysidota*, and *didymella*, and *Stegommata sulfuratella*, Meyr., transformations noticed.

Tinea lapella, Hübn., and *Cerostoma vitellum*, L. Larvæ described ; Sorhagen, B. E. Z. xxvi. pp. 143–145.

Lemmatophila phryganella. Larva described ; Barrett, Ent. M. M. xix. p. 166.

Tinea : ovoviviparous species from Brazil ; Meldola & F. Müller, P. E. Soc. 1882, pp. xxii. & xxiii. *T. pellionella*, Linn. (= *carnariella*, Clem., *griseella*, Chamb., and *flavifrontella*, Pack., larva), *tapetzella*, Linn., and *biselliella*, Humm. (= *crinella*, Treitschke, *destructor*, Steph., *lanariella*, Clem., and *flavifrontella*, Pack., imago), discussed ; they are probably introduced species in N. America: Fernald, Canad. Ent. xiv. pp. 166–169 ; *T. vastella* : larvæ infesting a horse's hoof ; Waterhouse & Walsingham, P. E. Soc. 1882, p. xx.

Prodoxus and *Pronuba*: peculiar structure of the male generative organs ; Hagen, Zool. Anz. v. pp. 18–21. All the specimens of both genera visiting one flower of *Yucca* proved to be males ; Meehan, P. Am. Ass. xxx. pp. 205–207.

Prodoxus decipiens. Oviposition ; Riley, P. Am. Ass. xxx. p. 272.

Micropteryx. List of Italian species ; Bergamo, Nat. Sicil. i. pp. 88 & 89.

Bida crambella, Walk., = *Psecadia* (?) *radiosella*, Walk. ; Butler, Ann. N. H. (5) ix. p. 99.

Dichelia (?) *humerana*, Walk., is one of the *Tineina* allied to *Depressaria* ; Meyrick, P. Linn. Soc. N. S. W. vii. p. 174.

Gelechia ligulella, *taeniolella*, *sircomella*, and probably *corticella*, are identical ; Threlfall, Ent. M. M. xix. pp. 112 & 113. *G. maculiferella*, noticed ; Stainton, Ent. M. M. xix. p. 93. *G. terrella*, Hübn. : larva described ; Heylaerts, CR. Ent. Belg. xxvi. pp. cxlii. & cxliii.

Blabophanes monachella noticed from Java ; Snellen, Tijdschr. Ent. xxv. p. cxxvii.

Lita solanella, Boisd. Habits and transformations described ; Tepper, Tr. R. Soc. S. Austr. iv. pp. 57–60, *cf.* also p. 154.

Chelaria conscriptella. Larva described ; Richardson, Ent. M. M. xix. p. 114.

Anchinia griescens, Frey, is distinct from *daphnella*, W. V. ; Zeller, JB. Ges. Graub. xxv. p. 66.

Œcophora pseudospretella and *Endrosis fenestrella*. Larvæ destroyed by fleas ; Boden, Ent. xv. p. 70.

Coriscium sulphurellum. Observations on larvæ ; Stainton, Ent. M. M. xix. pp. 92 & 93.

Coleophora inulæ, Hein., noticed as new to Britain ; Machin, Ent. xv. p. 204.

Stathmopoda pedella noticed ; South, Ent. xv. p. 211.

Chauliodus insecurellus, Staint., and allies noticed ; Stainton, *l. c.* pp. 73–76.

Laverna ochraceella and *Cosmopteryx lienigiella* noticed; Stange, S. E. Z. xliii. pp. 513 & 514.

Laverna atra, Haw.: habits and synonymy noticed; Douglas, Ent. M. M. xix. pp. 91 & 92. *L. atra* and *hellerella*, Dup., are distinct; Threlfall, Ent. M. M. xix. p. 112. *L. parda*, Butl., var. *montivolans* from Honolulu described; Butler, Tr. E. Soc. 1882, p. 44.

Lithocolletis pomifoliella, Zell., var. *deflexella*, Staint., noticed; Steudel, JH. Ver. Württ. xxxviii. p. 231. *L. platani*, Staud., noticed; McLachlan, Ent. M. M. xix. p. 94.

Phyllocnistis: Chambers refers fossil Tineid mines referred to by Hagen (Nature, xxv. pp. 265 & 266) to *P. liriodendronella*, Clem. (*P. liquidamberisella*, Chamb., probably = *vitifoliella*, Chamb., is an allied species), and *Gracilaria sassafragella*, Chamb., Nature, xxv. p. 529.

Bucculatrix ambrosiifoliella, Chamb.: notes on larva, cocoon, &c.; Chambers, Canad. Ent. xiv. pp. 153–160, fig.

Nepticula agrimoniæ, Heyd., recorded as new to Britain; Fletcher, Ent. M. M. xviii. p. 211.

Bedellidæ, fam. n., Meyrick, P. Linn. Soc. N. S. W. v. p. 133. Allied to *Lithocolletidæ* and *Elachistidæ*; head roughly tufted; larvæ with sixteen legs. To include *Tischeria*, *Bedellia*, *Urodeta*, *Arctocoma* (g. n.), and perhaps *Œnophila*.

New genera and species:—

Pantelamprus, Christoph, Bull. Mosc. lvii., 1, p. 21. Allied to *Cryptolechia* and *Psoricoptera*; type, *P. staudingeri*, sp. n., *l. c.* p. 22, Vladivostok.

Cryptopeges, Butler, Ann. N. H. (5) ix. p. 100. Allied to *Cryptophasa* (?); type, *C. fulvia*, sp. n., *l. c.* p. 101, Melbourne.

Latometus, id. *l. c.* p. 101. *Gelechiidæ* (?): type, *L. pilipes*, sp. n., *l. c.* p. 102, Melbourne.

Zacorus, id. *l. c.* p. 102. Allied to *Œcophora*; type, *Z. carus*, sp. n., *l. c.* p. 103, Melbourne.

Epicephala, Meyrick, P. Linn. Soc. N. S. W. v. p. 168. Allied to *Ornix*; type, *E. colymbetella*, sp. n., *l. c.* p. 169, Sydney.

Arctocoma, id. *l. c.* p. 170. Allied to *Bedellia*; wings much broader; antennæ shorter than fore-wings. Type, *A. ursinella*, sp. n., *l. c.* p. 171, Paramatta, &c.

Stegommata, id. *l. c.* p. 171. Differs from *Lyonetia* in the strongly-tufted, rough head. Types, *S. leptomitella* and *sulfuratella*, spp. nn., *l. c.* p. 172, Sydney.

Atalopsycha, id. *l. c.* p. 176. Allied to *Phyllocnistis*, but with a superficial resemblance to *Bucculatrix*; type, *A. atyphella*, sp n., *l. c.* p. 177, Sydney.

Crobylophora, id. *l. c.* p. 177. Differs from *Stegommata* by the short antennæ, and from *Bucculatrix* by the presence of labial palpi; types, *C. daricella*, Queensland, and *chrysidiella*, Sydney, &c., spp. nn., *l. c.* p. 178.

Solenobia suifunella, Christoph, Bull. Mus. lvi. (4) p. 430, Vladivostok.

Morophaga (?) *barbata*, Christoph, *l. c.* p. 432, Askold.

Tinea simulans, Butler, Tr. E. Soc. 1882, p. 43, Honolulu ; *T. araliæ*, Fritsch, Beitr. Pal. Öst.-Ungarns, ii. p. 6, pl. ii. fig. 7 (Bohemian Limestone).

Incurvaria (?) *insignis*, Christoph, *l. c.* p. 433, Vladivostok.

Adela staudingerella, id. *l. c.* p. 435, Vladivostok ; *A. irroratella*, p. 5, *nobilis*, p. 7, *raddeella*, p. 8, and *rubro-fascia*, p. 9, *id. op. cit.* lvii. (1), Vladivostok and Raddefka.

Roeslerstammia incerta, id. *l. c.* p. 10, Vladivostok.

Hyponomeuta nigrifimbriatus[*-ta*], id. *l. c.* p. 11, Askold.

Corinea aurata, Butler, Ann. N. H. (5) x. p. 238, Duke of York Island.

Argyresthia huguenini, Frey, MT. schw. ent. Ges. vi. p. 369, Switzerland ; *A. semiflavella*, Christoph, *l. c.* p. 12, Vladivostok.

Cerostoma amœnella and *blandella*, id. *l. c.* pp. 12 & 14, Vladivostok.

Psecadia albarracinella, Ragonot, Bull. Soc. Ent. Fr. (6) ii. p. lxvi. Aragon; *P. septempunctata*, Christoph, *l. c.* p. 14, Vladivostok.

Depressaria mongolicella, Raddefka, p. 15, *abjectella*, p. 16, and *costæmaculella* [*costi-*], Vladivostok, &c., p. 18, *id. l. c.*

Cryptolechia catenulella, id. *l. c.* p. 19, Vladivostok.

Gelechia aurorella and *amœnella*, Frey, *l. c.* pp. 365 & 366, Switzerland ; *G.* (*Bryotropha*) *fuliginosella*, Snellen, Vlinders van Nederland, Micr. ii. p. 645, Holland.

Feleia [? *Teleia*] *inscriptella*, Christoph, *l. c.* p. 25, Raddefka, Askold.

Parasia inflammatella, id. *l. c.* p. 26, Vladivostok, &c.

Anacampsis splendens, Staudinger, Hor. Ent. Ross. xvi. p. 90, Amasia.

Tachyptilia solemnella, Christoph, *l. c.* p. 27, Amur.

Ceratophora modicella, id. *l. c.* p. 28, Vladivostok.

Eciteles flavimaculata, id. *l. c.* p. 29, Vladivostok.

Hypsilophus sparsellus and *consertellus*, id. *l. c.* pp. 29 & 31.

Nothris chinganella, id. *l. c.* p. 32, Raddefka and Vladivostok.

Lecithocera luridella, id. *l. c.* p. 33, Raddefka and Vladivostok.

Œcophora venustella and *zelleri*, id. *l. c.* pp. 34 & 35, same loc.

Glyphopteryx speculiferella and *simplicella*, id. *l. c.* pp. 37 & 38, Vladivostok ; *G. cyanochalca*, Blue Mountains, p. 185, *cyanophracta*, New South Wales, p. 186, *amblycerella*, Gippsland, Victoria, p. 189, *holodesma*, p. 190, *tetrasema*, Tasmania, p. 191, and *acinacella*, Gippsland, Victoria, p. 193, Meyrick, P. Linn. Soc. N. S. W. vii.

Gracilaria mandschurica, Christoph, *l. c.* p. 39, Amur; *G. œnopella*, Sydney, *xanthopharella*, Sydney, Paramatta, p. 141, *adelina*, New Zealand, p. 142, *auchetidella*, Illawarra, *æthalota*, Dunedin, p. 143, *lepidella*, *ordinatella*, Sydney, p. 145, *tricuneatella*, Paramatta, p. 146, *autadelpha*, Sydney, p. 147, *cænotheta*, Blue Mountains, p. 148, *hoplocala*, Sydney, p. 149, *chalcoptera*, Paramatta, p. 151, *ethela*, New Zealand, p. 152, *ida* (= *formosa*, pt. Staint.), p. 155, *mnesicala*, Sydney, Paramatta, &c., p. 156, *lyginella*, Paramatta, p. 157, *aellomacha*, Wellington, *thalassias*, New South Wales, p. 159, *eumetalla*, Brisbane, Sydney, *eupetala*, Sydney, Paramatta, p. 160, *alysidota*, p. 161, *ochrocephala*, p. 162, *nereis*, p. 163, *didymella*, and *laciniella*, Sydney, &c., p. 164, Meyrick, *l. c.* v. ; *G. argy-*

rodesma, p. 194, *chionoplecta*, p. 195, and *toxomacha*, p. 197, *id. l. c.* v., Sydney.

Coriscium ochridorsellum, Sydney, and *æolellum*, Wollongong, *id. l. c.* v. pp. 166 & 167.

Coleophora adjunctella, Hodgkinson, Ent. xv. p. 37, and Ent. M. M. xviii. p. 189, Ulverston; *C. tritici*, Lindeman, Bull. Mosc. lvi., 3, pp. 39–42; Ent. Nachr. viii. pp. 38–40; Ent. M. M. xix. pp. 101–104: destructive to wheat in Russia. *C. octagonella*, figs. 17, 17*a*, *b*, Southern States (case only), p. 431, *viridicuprella*, figs. 2 & 2*a*, California, Oregon, *cornella*, figs. 1 & 1*a*, California, p. 432, *glaucella*, figs. 3 & 3*a*, San Francisco, p. 433, *irroratella*, fig. 5, California, *wyethiæ*, figs. 4 & 4*a*, p. 434 *discostriata*, figs. 6 & 6*a*, p. 435, *accordella*, fig. 7, California and Oregon, *tenuis*, fig. 8, p. 436, *ochrostriata*, fig. 9, *lynosyridella*, figs. 10 & 10*a*, California, p. 438, *nigro-striata*, fig. 11, Oregon, p. 438, *bella*, fig. 12, *viscidiflorella*, figs. 13 & 13*a*, p. 439, *acutipennella*, fig. 14, California, *bipunctella*, fig. 15, Texas, p. 440, and *castipennella*, figs. 16 & 16*a*, California, p. 441, Walsingham, Tr. E. Soc. 1882, pl. xvii.

Goniodoma millierella, Ragonot, Bull. Soc. Ent. Fr. (6) ii. p. cxlix., Cannes.

Laverna seeboldiella, id. *l. c.* p. lxvi., Bilbao; *L. aspersa*, Butler, Tr. E. Soc. 1882, p. 44, Honolulu.

Butalis hydrargyrella, Hofmann, JH. Ver. Württ. xxxviii. p. 223, Würtemberg.

Pancalia sichotella, Christoph, *l. c.* lvii. (1) p. 40, Vladivostok.

Staintonia (?) *apiciguttella*, id. *l. c.* p. 42, Vladivostok.

Elachista occidentalis and *infuscata*, Frey, *l. c.* pp. 372 & 373, Switzerland.

Lithocolletis aglaozona, Meyrick, *l. c.* vii. p. 199, Sydney (probably introduced).

Phyllocnistis diaugella and *iodocella*, id. *l. c.* v. pp. 173 & 174, Sydney.

Cemiostoma chalcocycla, id. *l. c.* vii. p. 201, Gippsland, Victoria, Tasmania.

Bucculatrix eucalypti, p. 179, *lassella*, Sydney, p. 180, and *asphyctella*, Paramatta, p. 181, *id. l. c.* v.

Opostega snelleni, Von Nolcken, S. E. Z. xliii. p. 197, Cannes; *O. orestias*, Brisbane, *striella*, Paramatta, &c., p. 175, and *gephyræa*, Sydney, p. 176, Meyrick, *l. c.*

Pterophoridæ and Alucitidæ.

Barrett, C. G. Notes on British *Pterophori*. Ent. M. M. xviii. pp. 177–180.

An attempt to clear up the synonymy, and to harmonize it with that in use on the Continent. *Oxyptilus latus* and *distans*, Zell., are probably identical; *Mimæoptilus serotinus*, Zell., = *bipunctidactylus*, Haw.; *M. aridus* of British authors (? ? Zell.), probably = *plagiodactylus*, Staint., the variation of which latter insect is noticed at length; *M. hodgkinsoni*, Gregs., = *lewii*, Zell., = *zophodactylus*, Dup.

South, R. Contributions to the history of the British *Pterophori*. Ent. xv. pp. 31–36, 102–106, & 145–149, pls. ii. & iii.

Includes descriptions, frequently with transformations, of *Platyptilia trigonodactyla*, Haw., pl. iii. figs. 1 & 1*a–c*, *P. zetterstedti*, Zell., *P. tæniadactylus*, sp. n., and *Oxyptilus lætus*, Zell. (which is distinct from *distans*, Zell.), *Lioptilus microdactylus*, Hübn., figs. 1 1*a–1c*; *Œdematophorus lithodactylus*, Treitschke, figs. 2 & 2*a–c*; *Lioptilus lienigianus*, Zell., figs. 3 & 3*a–c*, and *tephradactylus*, figs. 4 & 4*a–c*, pl. ii., *Platyptilia dichrodactyla*, Müh., figs. 2 & 2*a–c*, *Aciptilia galactodactyla*, Hübn., figs. 3 & 3*a–c*, *Mimeseoptilus pterodactylus*, Linn., figs. 4 & 4*a–c*, pl. iii.

The *Pterophoridæ* and *Alucitidæ* probably mimic thistle-down, &c.; Taylor, Nature, xxvi. p. 447, and Sci. Goss. xviii. pp. 258 & 259.

List of Italian *Pterophoridæ* and *Alucitidæ*, Curo, Nat. Sicil. i. pp. 142–144, & 150–155.

Agdistis heydeni and *tamaricis*, Mann, *Œdematophorus giganteus*, Mann (*cf.* also p. 523), and *Aciptilia siceliota*, Zell., noticed from Cannes; Von Nolcken, S. E. Z. xliii. pp. 199–201.

Aciptilia similidactyla and *Lioptilus distinctus*. Larvæ noticed; Stange, S. E. Z. xliii. p. 514.

Œdematophorus inquinatus, Zell., and *Lioptilus homodactylus*, Walk. Transformations described; Coquillett, Papilio, ii. pp. 61 & 62.

Platyptilus cardui, Riley, *Œdematophorus cretidactylus*, Fitch, *Lioptilus homodactylus*, Walk., *kellicotti*, Fish, and *Aciptilia montanus*, Wals. Transformations described; Kellicott, Bull. Buff. Soc. iv. pp. 47–52.

Amblyptilia punctidactyla, Haw., and *acanthodactyla*, Hübn. Resemblance of larvæ; Williams, Ent. M. M. xviii. pp. 212 & 213.

Mimeseoptilus hodgkinsoni, Gregs. Hodgkinson asserts its distinctness from *loewii*; Ent. M. M. xviii. p. 212.

Pterophorus pterodactylus and *monodactylus*, Linn.: larvæ described; Porritt, Ent. xv. pp. 44, 45, 90 & 91. *P. serotinus*, Zell.: on the wing from June to October; *id. l. c.* p. 262.

Amblyptilia tæniadactylus [*tæniidactyla*], sp. n., South, Ent. xv. p. 34, North Devon.

Oxyptilus leonuri, sp. n., Stange, S. E. Z. xliii. p. 514, Germany.

Aciptilia amurensis, sp. n., Christoph, Bull. Mosc. lvii., 1, p. 43, Vladivostok, &c.

Platyptilus littoralis, sp. n., Butler, Tr. E. Soc. 1882, p. 44, Honolulu.

DIPTERA.

BY

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

THE GENERAL SUBJECT.

ADOLPH, E. Vorläufige Mittheilung über die Flügel der Dipteren. Zool. Anz. v. pp. 609 & 610.

Calls attention to his larger work on the subject.

ARRIBÁLZAGA, E. L. Catalogo de los Dipteros hastu ahora descritos que se encuentran en las Repúblicas del Rio de la Plata. Bol. Ac. Arg. iii. pp. 109–152.

The portion of this paper in the Recorder's hands, which is only a fragment, extends to *Midas*. No new species are described.

BECHER, E. Zur Kenntniss der Kopfbildung der Dipteren. Wien. ent. Z. i. pp. 49–54, figs.

The importance in classification of the presence or absence of a frontal protuberance is here indicated.

——. Zur Kenntniss der Mundtheile der Dipteren. Denk. Ak. Wien, xlv. pp. 123–162, pls. iv.

Includes an historical introduction and a description of the various parts, at first general, and then as observed in the various families of *Diptera*; a bibliography of the subject is added. No abstract of this paper can here be attempted.

BELING, —. Beitrag zur Metamorphose zweiflügeliger Insecten aus den Familien *Tabanidæ*, *Leptidæ*, *Asilidæ*, *Empidæ*, *Dolichopidæ*, und *Syrphidæ*. Arch. f. Nat. xlviii. pp. 186–240.

Relates to the following species:—*Sargus cuprarius*, L., *Chrysomyia polita*, L., *Chrysops relictus*, Meig., *Chrysopila lœta*, Zett., *nigrita*, Fabr., *nubecula*, Fall., *Symphoromyia crassicornis*, Panz., *Leptogaster cylindricus*, De Geer, *Dioctria œlandica*, L., *flavipes*, Meig., *linearis*, Fabr., *Laphria gilva*, L., *Asilus atricapillus*, Fall., *cyanurus*, Loew, *Empis tessellata*, Fabr., *stercorea*, L., *æstiva*, Loew, *Microphorus pusillus*, Macq., *Ocydromia glabricula*, Fall., *Rhamphomyia sulcata*, Fall., *nitidula*, Zett., *dentipes*, Zett., *Hilara interstincta*, Fall., *pilosa*, Zett., *maura*, Fabr., *matrona*, Hal., *Psilopus platy-*

pterus, Fabr., *Neurigona quadrifasciata*, Fabr., *Argyra vestita*, Wied., *Porphyrops crassipes*, Meig., *Systenus leucurus*, Loew, *Dolichopus discifer*, Staun., *popularis*, Wied., *trivialis*, Hal., *longicornis*, Staun., *Chrysotoxum bicinctum*, L., *Xanthogramma ornata*, Meig., and *Syritta pipiens*, L. A table of larvæ of various genera is added.

BIGOT, J. M. F. Diptères nouveaux ou peu connus. 19e partie. Ann. Soc Ent. Fr. (6) ii. pp. 1–22.

The author discusses the characters of the *Muscidæ* in general; the genus *Rœselia*, Desv., is one of the *Tachinides*, and *Tryptocera frontalis*, Macq. (? = *Actia tamia*, Desv.), is much nearer *Actia* than *Tryptocera*. The classification of the *Anthomyzidæ* is then discussed, and a table of genera given, a few new, but without indication of types. Lastly, the characters of the genus *Ctenostylum* are discussed.

BRANDT, E. Recherches sur le système nerveux des larves des insectes diptères. C. R. xciv. pp. 982–985; Ann. N. H. (5) ix. pp. 453–455; Zool. Anz. v. pp. 231–234; Troudy Ent. Ross. xiii. pp. liv.–lvii.

The larvæ of the *Leptidæ*, *Bibionidæ*, *Therevidæ*, *Xylophagidæ*, *Asilidæ*, *Dolichopezidæ*, and *Fungicolæ* have thirteen ganglia, two cephalic, three thoracic, and eight abdominal. Some of the *Fungicolæ*, however as *Rhyphus*, have only twelve, owing to the fusion of the last two abdominal ganglia. In the larvæ of the *Tabanidæ*, there are only seven ganglia, one cephalic, one thoracic, and five abdominal.

BRAUER, F. Über Latreille's Segment mediaire und das Metathorax-Stigma der Dipteren. Zool. Anz. v. pp. 306 & 307.

The author corrects his former opinions. There is no "segment mediaire" in *Diptera*; what Latreille regarded as such is partly the free mesophragma of the *Tipulidæ*, and partly the metanotum. The thorax of *Diptera* is constructed like that of *Cicadidæ* and *Lepidoptera*. A short description of the parts of the thorax (chiefly referring to the *Tipulidæ*) follows. All *Diptera* possess a metanotum, but the author's former views as to the existence of a metascutellum are entirely erroneous.

INCHBALD, P. [See *Insecta*, General Subject.]

JACOBS, —. De la presence des larves d'Œstrides et de Muscides dans le corps de l'homme. CR. Ent. Belg. xxvi. pp. cl.–clx.

A critical summary of previously recorded observations.

MEINERT, F. Die Mundtheile der Dipteren. Zool. Anz. v. pp. 570–574, 599–603.

A controversial article in reply to Becher's views.

OSTEN-SACKEN, C. R. *Diptera* from the Philippine Islands, brought home by Carl Semper. B. E. Z. xxvi. pp. 83–120, 187–252.

Semper's collection contained about 250 species; only 52 were previously known from the Philippines. The fauna appears to be remarkably specialized, but to exhibit considerable affinities with that of the Malay Archipelago. Many undetermined species are mentioned, without being described.

[Osten-Sacken, C. R.] On Professor Brauer's paper: Versuch einer Charakteristik der Gattungen der Notocanthen, 1882. *L. c.* pp. 363–380.

An elaborate criticism, containing inter alia the following notes:—Loew's *Xylophagidæ* is a heterogeneous group, in which *Xylophagus* and *Cænomyia* may be retained; they are allied to the *Leptidæ*, to which latter family *Arthropeas* and *Glutops* must be referred; and *Subula* may be referred to the *Beridina*; *Xylophagus*, Latr., however = *Subula*, and *Pachystomus*, Latr., = *Xylophagus*, auct. *Biastes*, Walk. (preocc.), = *Rosapha*, Big.; *Toxocera limbinervis*, Macq., = *Eudmeta marginata* (F.), Wied.; *Solva*, Walk., = *Subula*, Macq.; *Diphysa*, Macq., is a fictitious genus, founded on an error regarding the venation of *Xylophagus spiniger* (= *Beris servillii*, Macq.), and *rufipalpis*, Wied.; *Engonia*, *Thylacosoma*, and *Lagenostoma*, Brauer, = *Negritomyia*, Big., and *Ruba* and *Massicyta*, Walk., respectively; *Drasteria* and *Compsosoma*, Brauer, are preoccupied (Hübn., *Lep.*, & Serv., *Col.*); *Engonia aurata*, Br., = *Clitellaria festinans*, Walk.; *Ephippium spinigerum*, Dol., = *bilineatum*, F. (*bivittatum*, Wied.); but *E. maculipennis*, Macq., is distinct; *Antissa*, Walk., and *Cyanauges*, Phil., are probably distinct; the true type of *Cacosis*, Walk., is *Sargus niger*, Wied.

——. Referate über einige in russischer Sprache erschienene dipterologischen Schriften. Wien. ent. Z. i. pp. 149–151, 171–174.

Relates to papers of Jaroscheffski, Portchinsky, and Fedchenko.

Viallanes, H. Note sur la structure du nerf et sa terminaison dans les muscles striés chez quelques insectes. Mém. Soc. Biol. (2) vii. pp. 371 & 372; *cf.* also J. R. Micr. Soc. (2) ii. pp. 34 & 35.

Observations on larvæ of *Musca*, *Eristalis*, and *Ctenophora*.

——. On the Post-embryonic Development of the *Diptera*. Ann. N. H. (5) ix. pp. 61–63 (from C. R. xciii. pp. 800–812; *cf.* Zool. Rec. xviii. *Ins.* p. 285).

Wulp, F. M. Van der. Amerikaansche *Diptera* (Vervolg van deel xxiv.). Tijdschr. Ent. xxv. pp. 77–135, pls. ix. & x.

Includes *Bombyliidæ* to *Syrphidæ*. The remarks on many known species are highly important, but are too long to be reproduced. The figures represent wings and heads, and include, besides new species, those of several known species of *Anthrax*, *Argyramœba*, *Comptosia*, *Pteropezus*, and *Temnocera*.

——. Remarks on certain American *Diptera* in the Leyden Museum, and description of nine new species. Notes Leyd. Mus. iv. pp. 73–92.

The following known species are described:—*Anthrax halcyon*, Say, *hypomelas*, Macq., *festiva*, Phil., *Diogmites rufescens*, Macq., *Mallophora nigritarsis*, Fabr., *Erax rufinus*, Wied., *Volucella scutellata*, Macq., *Eristalis bogotensis*, Macq., *quadraticornis*, Macq. (= *testaceiscutellatus*, Macq.), *Dolichogyna fasciata*, Macq., *Syrphus calceolatus*, Macq., *Echinomyia immaculata*, Macq., *Phrissopoda splendens*, Macq., *Sarcophaga chlorogaster*, Wied., *rufipalpis* and *chilensis*, Macq., *Cyrtoneura stabulans*,

Fall. (= *Anthomyia cinerascens*, Wied., = *C. ricina*, Macq.), and *Heterochroa picta*, Schin.

The *Diptera Eromochæta* generally have contiguous eyes in the males, and are aerial species, while the *Diptera Chætophora* generally have non-contiguous eyes and strong legs; Osten-Sacken, Wien. ent. Z. i. pp. 91 & 92.

J. Mik publishes an abstract of Osten-Sacken's Essay on Comparative Chætotaxy: SB. z.-b. Wien, xxxii. pp. 8–16; Ent. Nachr. viii. pp. 219–229; *cf.* also Karsch, Biol. Centralbl. ii. pp. 178–181, and Mik, Wien. ent. Z. i. pp. 121–123: translated into Dutch, with remarks by Van der Wulp; Tijdschr. Ent. xxv. pp. xci.–cix., woodcuts.

On *Diptera* injurious to fruit in S. Italy and Sicily; Palumbo, Nat. Sicil. i. pp. 93–96.

Notes on *Diptera*, apparently relating to the wings and poisers; Poletaeff, Troudy Ent. Ross. xii. pp. 222–230.

Veronica. Various species fertilized by *Diptera*; Mackenzie, Stapley, & Ransom, Nature, xxvii. pp. 127, 149, 150, & 174.

Osten-Sacken protests against enforcing the law of priority in the nomenclature of *Diptera*; l. c. pp. 191–193.

Synonymic notes on *Diptera*; Bigot, Bull. Soc. Ent. Fr. (6) ii. pp. xviii. & xix.

Column of gnats; Sci. Goss. xviii. p. 282.

Dipterous ova attached to the tusks of female Indian elephants; Cobbold, Tr. L. Soc. (2) ii. pp. 248 & 249.

Notes on parasitic *Diptera*; Meade, Ent. xv. p. 24.

Cecidomyiidæ.

Dipterous galls on *Viola tricolor*, L., *Prunella grandiflora*, Jacq., and *Senecio nemorensis*, L., noticed; Thomas, SB. bot. Ver. Brandenburg, xxiii.; *cf.* Ent. Nachr. viii. pp. 12–14.

Cecidomyia leguminicola, Lintn., and *trifolii*, noticed as injurious to clover; Saunders, Rep. E. Soc. Ont. 1881, pp. 38–43, figs. 12–14, and p. 45, fig. 17.

Villigera frauenfeldi, Karsch, is not a Cecidomyid, but a Coccid; Mik, Wien. ent. Z. i. p. 63.

Cecidomyia piceæ, Henschel, CB. Forstwesen Wien, vii. pp. 505–507, figs. 27–30; *C. lœwii*, Mik, Wien. ent. Z. i. p. 265: both from Austria.

Hormomyia bergenstammi, sp. n., Wachtl, Wien. ent. Z. i. p. 289, pl. iv. figs. 1–1c (galls), Corfu.

Mycetophilidæ.

Sciara ocellaris, Ost.-Sack. Life-history; Comstock, Rep. Ins. 1881, pp. 10–12, and Riley, Rep. Ins. 1882, pp. 202–204, pl. xvii.

Bibionidæ.

Bibio pomonæ. Heaps of dead and dying flies observed on a road; Hanson & Meade, Naturalist, viii. p. 10.

Blepharoceridæ.

Brauer, F. Ueber die Verwandschaft und systematische Stellung der Blepharoceriden. Wien. ent. Z. i. pp. 1–4.

The larval characters show the relationship of this family to the *Orthorrhapha Encephala*, to which tribe Brauer had already conjecturally referred it.

Culicidæ.

On mosquitoes at Loango; Güssfeldt, Loango Expedition, iii. pt. ii. pp. 295 & 296.

Chironomidæ.

Balbiani, —. Sur la signification des cellules polaires des Insectes. C. R. xcv. pp. 927–929.

Contains a detailed account of the transformations of the polar cellules in the course of the development of the egg of *Chironomus*.

Chaoborus. Larva noticed; Pavesi, Rend. Ist. Lomb. (2) xiv. pp. 613–615.

Tanypus, Meig. The retractile antennæ of the larva described and figured; Meinert, Ent. Tidskr. iii. pp. 83–86, figs. 8–10.

Diplosis (?) *grassator*, sp. n., Fyles, Canad. Ent. xiv. pp. 237–239, fig. 25. Parasitic on *Phylloxera vastatrix* in Canada.

Tipulidæ.

Wallengren, H. D. J. Revision af Skandinaviens *Tipulidæ*. Ent. Tidskr. iii. pp. 13–30.

In the concluding portion of this paper the Swedish species of six genera are described (none new).

Westhoff, F. Ueber den Bau des Hypopygiums der Gattung *Tipula*, Meig., mit Berücksichtigung seiner generischen und specifischen Bedeutung, nebst einem systematischen Verzeichnisse aller bisher in der Provinz Westphalen aufgefundenen Arten aus der Familie der *Tipulidæ*. 1ster Theil, pp. 62, pls. 6. Inaugural Dissertation, Münster: 1882.

Not seen by the Recorder; an abstract is given in Wien. ent. Z. i. pp. 317–319.

Ptychoptera albimana, Fabr., noticed; Costa, Atti Acc. Nap. ix., 6, p. 44.

Dicranomyia saltans, Dol. Structure and habits noticed; Osten-Sacken, B. E. Z. xxvi. p. 88.

Ctenophora atrata, Linn., and var. *ruficornis*, noticed; Rossi, Ent. Nachr. viii. pp. 296 & 297.

Mongoma, Westw. Generic characters discussed; *Cylindrotoma albitarsis*, Dol., and *Limnobia trentepohli*, Wied., probably belong to this

genus, which may be placed provisionally among the *Limnobiina anomala*: id. *l. c.* pp. 89–91.

Tipula: larva supposed to occur as a human intestinal parasite; Mégnin, Bull. Soc. Ent. Fr. (6) ii. pp. cvi. & cvii. *T. pedata*, Wied., noticed; Osten-Sacken, *l. c.* p. 92. *T. rufina*, Meig.: transformations described; Mik, Wien. ent. Z. i. p. 35, pl. i. figs. 1–12.

Trichocera hirtipennis, Siebke, discussed; *id. l. c.* pp. 140–142, woodcut (wing).

Atomaria degeeri, Big., = *Epidapus atomarius*, De Geer; Mik, Wien. ent. Z. i. p. 65.

Scamboneura, g. n., Osten-Sacken, B. E. Z. xxvi. p. 95, fig. 1. General appearance of *Pachyrrhina*, but neuration of *Dolichopeza*. Type, *S. dotata*, sp. n., *l. c.*, Philippines. *Limnobia vittifrons*, Walk., probably belongs to this genus.

New species:—

Limnobia vormanni, Westhoff, Gattung *Tipula*, p. 56, Westphalia.

Trichosticha kollari, id. *l. c.* p. 57, Westphalia.

Dicranomyia osten-sackeni, id. *ibid.*, Westphalia.

Libnotes semperi, *termitina*, p. 88, and *familiaris*, p. 89, Osten-Sacken, B. E. Z. xxvi., Philippines.

Mongoma tenera, id. *l. c.* p. 89, Philippines.

Eriocera perennis and *mansueta*, id. *l. c.* pp. 91 & 92, Philippines.

Pachyrrhina laconica and *ortiva*, id. *l. c.* pp. 92 & 93, Philippines.

Ctenophora suspirans, p. 93, *idalia* and *dolens*, p. 94, Osten-Sacken, *l. c.*, Philippines.

Xylophagidæ.

Subula citripes, *Microdon mutabilis*, and *Microdon* or *Aphritis*, sp. Larvæ noticed; Laboulbène & Poujade, Bull. Soc. Ent. Fr. (6) ii. pp. xcvi. & xcvii.

Subula, Macq. Three species are found in France, *S. maculata*, Fabr., and *marginata* and *varia*, Meig., *S. maculata* and *atra*, Latr., and *citripes*, Duf., = *varia*; Laboulbène, Ann. Soc. Ent. Fr. (6) ii. pp. 313–315.

Stratiomyiidæ.

Viallanes, H. Note sur les terminaisons nerveuses sensitives des insectes. Bull. Soc. Philom. (7) vi. pp. 94–98.

The skin of the larva of *Stratiomyia* consists of three layers—the chitinous cuticle, the hypoderm, or chitinogenous layer, and the basal membrane. The nerves which rise below the basal membrane consist of a cylinder-axis and sheath, and emit branches right and left. Some of these branches extend to a tactile hair, and terminate in a fusiform organ, and others terminate in a multipolar ganglion-cellule; and their structure is minutely described.

Stratiomyia sp. Larvæ found in a hot spring in Colorado; Griffith & Packard, Am. Nat. xvi. pp. 599 & 600.

Odontomyia. Synopsis of North American species; most of the known species are redescribed: Day, P. Ac. Philad. 1882, pp. 74–88.

Rosapha bicolor, Big., may be distinct from *habilis*, Walk.; Osten-Sacken, B. E. Z. xxvi. p. 99.

Ptilocera amethystina, Voll., ? = *smaragdina*, Voll.; *id. l. c.* p. 100.

Odontomyia nigra, Kansas, p. 75, *flava*, Wyoming, *pilosus* [*-sa*], California, p. 76, *pubescens*, New York, California, *americana*, p. 77, *bicolor*, California, *willistoni*, New York, p. 78, and *extremis*, Connecticut, California, p. 80, Day, P. Ac. Philad. 1882, spp. nn.

Tabanidæ.

Gobert, E. Revision monographique des espèces françaises de la famille des Tabanides. Amiens: 8vo, pp. 53.

[Not seen by the Recorder.]

Chrysops unizonatus and *impar*, Rond., probably = *signifer*, Walk., and *dispar*, Fabr., respectively; Osten-Sacken, B. E. Z. xxvi. p. 97.

Dichælocera, Macq., = *Acanthocera*, Macq.; Bigot, Bull. Soc. Ent. Fr. (6) ii. p. xix.

Pangonia depressa, Macq., and *crocata*, Jaenn., = *lata*, Guer.; Von Röder, S. E. Z. xlvii. p. 510.

Atylotus nigrifacies, sp. n., Gobert, Bull. Soc. L. Nord France, v. p. 30, Provence.

Hæmatopota nigricornis and *bigoti*, spp. nn., *id. l. c.* p. 31, France.

Tabanus sviridowi, Portschinsky, Hor. Ent. Ross. xvi. p. 273, Caucasus; *T. vanderwulpi* (= *pictipennis*, Wulp, *nec* Macq.) and *ixion*, Osten-Sacken, B. E. Z. xxvi. pp. 97 & 99, Philippines: spp. nn.

Therioplectes californicus, *hæma* [*to*] *phorus*, p. 210, *captonis*, California, and *centron*, Colorado, p. 211, Marten, Canad. Ent. xiv., spp. nn.

Leptidæ.

Atherix limbata, sp. n., Osten-Sacken, B. E. Z. xxvi. p. 100, Philippines.

Chrysopila correcta, id. *l. c.* p. 101, fig. 2, Philippines; *C. apicalis*, Van der Wulp, Tijdschr. Ent. xxv. p. 119, Guadeloupe.

Asilidæ.

Arribálzaga, E. L. Asilides Argentinos. An. Soc. Arg. xiii. pp. 185–192; xiv. pp. 132–143.

A continuation of the papers mentioned in Zool. Rec. xviii. *Ins.* p. 242.

Damalis, Loew, discussed, and Asiatic species tabulated; Osten-Sacken, B. E. Z. xxvi. pp. 103–105.

Damalina, Dol., recharacterized; *id. l. c.* pp. 106 & 107.

Scytomedes menstrua, Löw, MS., = *Triclis* (*Dasypogon*) *hæmorrhoidalis*, Fabr.; Von Röder, S. E. Z. xliii. pp. 244 & 245.

Acnecephalum olivieri, Macq., noticed; *id. l. c.* p. 245.

Laphria taphius, Walk., ? = *dimidiata*, Macq.; Osten-Sacken, *l. c.* p. 109.

Dasythrix leucophæa, Arribálzaga, redescribed by him; An. Soc. Ar[illegible] xiv. p. 138.

Mallophora ruficauda, *pluto*, *robusta*, Wied., *ventralis* and *rufiventris*, Macq., tabulated; *id. l. c.* pp. 142 & 143.

Phellus glaucus, Walker, figured by Waterhouse, Aid, ii. pl. cxxiv.

Asilus barbarus, Fabr., noticed from Sardinia; Costa, Atti Acc. Nap. ix., 11, p. 40.

New genera and species:—

Myelaphus, Bigot, Bull. Soc. Ent. Fr. (6) ii. p. xci. Allied to *Dasypogon*; type, *M. melas*, sp. n., *l. c.*, California.

Rhathimomyia, Arribálzaga, An. Soc. Arg. xiv. p. 135. Allied to *Atomosia*; scutellum convex, sloping, rather prominent, without setæ, hind femora thickened, with a few short thick bristles below; hind tibiæ not ciliated, abdomen ob-triangular, less convex above (in ♂), or ovate and somewhat depressed (♀), with the apex not broadly rounded, but rather obtusely pointed; 7th segment distinct, especially in ♂, male organs slightly exserted. Type, *R. nitidula*, sp. n., *l. c.*, Buenos Aires.

Leptogaster princeps, Osten-Sacken, B. E. Z. xxvi. p. 102, Philippines.

Damalis immerita and *vitripennis*, id. *l. c.* pp. 105 & 106, Philippines.

Damalina semperi and *cyanella*, id. *l. c.* pp. 107 & 108, Philippines.

Stichopogon peregrinus, id. *l. c.* p. 108, Philippines; *S. dziedzicki*, Schnabel, Deutsche E. Z. xxvi. p. 9, Poland.

Laphria phalaris and *pseudolus*, Osten-Sacken, *l. c.* pp. 109 & 110, Philippines.

Emphysomera aliena, id. *l. c.* p. 111, Philippines.

Deromyia weyenberghi and *placida*, Van der Wulp, Tijdschr. Ent. xxv. pp. 93 & 94, Argentine Republic.

Laparus argentinus, id. *l. c.* p. 95, Argentine Republic.

Holopogon bullatus, id. *l. c.* p. 100, Argentine Republic.

Hypenetes asiliformis, id. *l. c.* p. 101, pl. x. figs. 2–4, Argentine Republic.

Proctacanthus virginianus, pl. x. figs. 5 & 6, Virginia, p. 109, *senectus*, p. 110, and *brevistylatus*, Argentine Republic, p. 111, *id. l. c.*

Erax bilineatus, id. *l. c.* p. 115, Argentine Republic.

Epithriptus albisetosus, id. *l. c.* p. 116, Argentine Republic.

Holcocephala uruguayensis, Arribálzaga, An. Soc. Arg. xiv. p. 133, Uruguay.

Mallophora vegeta, id. *l. c.* p. 140, Buenos Aires.

Doryclus guentheri, id. *l. c.* p. 186, Buenos Aires.

Ceratotænia rhopalocera, id. *l. c.* p. 189, Buenos Aires.

Nemestrinidæ.

Hirmoneura obscura, Meig. Habits and transformations described; Handlirsch, Wien. ent. Z. i. pp. 224–228.

Trichophthalma landbecki, Phil., and *amœna*, Big., = *latipalpis*, Macq., of which an amended description is given; *T. vicarians*, Schin., = *T.*

(*Hirmoneura*) *nemestrinoides*, Jaenn.; Von Röder, S. E. Z. xliii. pp. 510 & 511.

Nemestrina anthophorina, sp. n., Portschinsky, Hor. Ent. Ross. xvi. p. 136, Caucasus.

Bombyliidæ.

Scinax sphenopterus, Loew. The following are its synonyms:—*Cyllenia elegantula*, Big., *Bombylisoma decoratum*, Rond., *Bombylius paulseni*, Phil., and *Ostentator punctipennis*, Jaenn.; Von Röder, S. E. Z. xliii. p. 510.

Anthrax argyropyga, Dol. ? = *Argyramœba distigma*, Wied.; *Exoprosopa flavicentris*, Dol., is probably distinct from *œnomaus*, Rond.; *E. ventrimacula*, Dol., *pelops*, Walk., and *leuconoe*, Jaenn., = *doryca*, Boisd.; Osten-Sacken, B. E. Z. xxvi. p. 112.

Anthrax melasoma, fig. 2 (*cf.* also Notes Leyd. Mus. iv. p. 74), Arizona, and *leucocephala*, fig. 6, Argentine Republic, spp. nn., Van der Wulp, Tijdschr. Ent. xxv. pp. 80 & 83, pl. ix.

Systœchus trisignatus, sp. n., Portschinsky, Hor. Ent. Ross. xvi. p. 136, Caucasus.

Cyrtidæ.

Lasia cœrulea, Rond., = *nigritarsis*, Blanch., and *L. œnea*, Westw., = *rufipes*, Westw.; Von Röder, S. E. Z. xliii. p. 510.

Empidæ.

Hemerodromia precatoria, Fall., and *melanocephala*, Hal., differentiated, and details figured; Mik, Wien. ent. Z. i. pp. 39–42, pl. i. figs. 13–18.

Elaphropeza exul, sp. n., Osten-Sacken, B. E. Z. xxvi. p. 113, Philippines.

Empis nodosa, sp. n., Beling, Arch. f. Nat. xlviii. p. 208, Harz.

Enoplempis cinerea, sp. n., Bigot, Bull. Soc. Ent. Fr. (6) ii. p. xci., California.

Dolichopodidæ.

Psilopus crinicornis, Wied., ? = *longicornis*, Dol., and *Diaphorus resumens*, Walk., probably includes 2 species; Osten-Sacken, B. E. Z. xxvi. pp. 114 & 115.

Psilopus longisetosus, sp. n., Van der Wulp, Tijdschr. Ent. xxv. p. 120, pl. x. fig. 7, Brazil.

Leucostola miki, sp. n., Kowarz, Wien. ent. Z. i. p. 32, Bohemia.

Diaphorus maurus, sp. n., Osten-Sacken, B. E. Z. xxvi. p. 114, Philippines.

Syrphidæ.

On the distribution of *Syrphidæ* in North America; Williston, Canad. Ent. xiv. p. 77.

Microdon mutabilis. Larvæ and pupæ occurring in nests of *Lasius niger*; Mayet, Bull. Soc. Ent. Fr. (6) ii. p. cvi.

Pipiza radicum destructive to *Phylloxera*, noticed and figured; W. Saunders, Canad. Ent. xiv. p. 127, fig. 18.

Lycastrirrhyncha, Bigot, is a good genus; Bigot, Bull. Soc. Ent. Fr. (6) ii. p. xviii.

Cryptoneura, Bigot, may stand as a section of *Chrysogaster*; *C. hieroglyphica*, Big., = *nitida*, Wied.: *id. l. c.* p. xix.

Catabomba, Ost.-Sack. ? = *Lasiophticus* [*-opticus*], Rond.; *id. ibid.*

Syrphus consequens, Walk., ? = *striatus*, Wulp; Osten-Sacken, B. E. Z. xxvi. p. 115.

Graptomyza, Wied., recharacterized, and Indo-Malayan species tabulated; *id. l. c.* pp. 117 & 118.

Sericomyia borealis singing while at rest; Swinton & Hellins, Ent. M. M. xviii. pp. 189 & 190.

Eristalis tenax. The larva is almost unaffected by powerful odours, but the imago is as sensitive to odours as any other insect; Nathan, Kosmos, xi. pp. 298 & 299, xii. p. 50.

Cyphipelta, Big., and the typical species, *Eristalis vesicularis*, Erichs. (= *C. conifrons*, Big.) recharacterized; Röder, Wien. Ent. Z. i. pp. 61 & 62.

Solenaspis, Osten-Sacken, = *Plagiocera*, Macq.; Bigot, *l. c.* p. xix.

Mallota eristaloides, Löw. Larva and pupa described; Becker, Wien. ent. Z. i. p. 253.

Milesia, Latr. Table of species of the Malay Archipelago and Philippine Islands; Osten-Sacken, *l. c.* pp. 188 & 189.

Plocota apiformis, Schrank. Pupa described; Becker, Wien. ent. Z. i. pp. 249 & 250.

Eumerus truquii, Rond., var. from Sardinia noticed; Costa, Atti Acc. Nap. ix., 11, p. 40.

Meropioides, Big., recharacterized; Williston, Canad. Ent. xiv. p. 77.

New genera and species:—

Endoiasimyia, Bigot, Bull. Soc. Ent. Fr. (6) ii. p. cxxxvi. Allied to *Volucella* and *Phalachromyia*; type, *E. indiana*, sp. n., *l. c.*, India.

Atemnocera, id. *l. c.* p. cxiv. Allied to *Temnocera*; third joint of antennæ oval, moderately long, face strongly tuberculated, chætum and eyes hairy, scutellum sex-spinose. Type, *Volucella scutellata*, Macq.

Kirimyia, id. *l. c.* p. cxxxvi. Allied to *Myolepta*; type, *K. eristaloidea*, sp. n., *l. c.*, Japan.

Eugeniamyia, Williston, Canad. Ent. xiv. p. 80. Allied to *Brachyopa*; face tuberculate, not carinate, more produced and less punctate; abdomen long; well-developed scutellar, postular, dorsopleural and mesopleural bristles. Type, *E. rufa*, sp. n., *l. c.*, Washington Territory.

Ischyrosyrphus, Bigot, *l. c.* p. lxviii. Allied to *Syrphus*; type, *S. sivæ*, sp. n., *l. c.*, India.

Ancylosyrphus, id. *l. c.* Differs from *Syrphus* in the ♂ organs being armed at the tip beneath with two opposing hooks; type, *S. salviæ*, Fabr.

Simosyrphus, id. *l. c.* Allied to *Syrphus*; face with no projection, third joint of the antennæ twice as long as the first and second. Types, *S. grandicornis* and *flavifacies*, Macq.

Doliosyrphus, id. *l. c.* p. cxx. Allied to *Eristalis*; chætum bare, eyes hairy, contiguous in ♂, hind femora much thickened, hind tibiæ sometimes dilated, densely ciliated behind. Types, *D. geniculatus*, Buenos Aires, *scutellatus*, p. cxx., and *hirtipes*, Panama, p. cxxii., spp. nn.

Prionotomyia, id. *l. c.* p. cxxi. Allied to *Helophilus*; front conical, rather prominent; face slightly concave and tuberculated, hind femora moderately thickened, hind tibiæ a little dilated, moderately bituberculate within; basal joint of the hind tarsi long, thickened, thickly velvety beneath; chætum and eyes bare. Type, *P. tarsata*, sp. n., *l. c.*, Senegal.

Tigridemyia, id. *l. c.* p. cxxi. Allied to *Helophilus*; femora much thickened and curved, face slightly tuberculate below the front; abdomen conical, chætum and eyes naked. Type, *T. pictipes*, sp. n., *l. c.*, Java.

Ascmosyrphus, id. *l. c.* p. cxxviii. Allied to *Helophilus*; to include *A. oculiferus* [*-fer*], *nigro-scutatus*, *flavo-caudatus*, p. cxxviii., and *bicolor*, p. cxxix., spp. nn., Mexico.

Eumerosyrphus, id. *l. c.* Allied to *Helophilus*; type, *E. indianus*, sp. n., *l. c.*, India.

Eurhinomallota, id. *l. c.* p. lxvii. Allied to *Mallota*; type, *E. metallica*, sp. n., *l. c.*, Mexico.

Brachymyia, Williston, *l. c.* p. 77. Allied to *Eriophora* (?); types, *B. lupina* and *nigripes*, spp. nn., *l. c.* pp. 77 & 78, California.

Hadromyia, id. *l. c.* p. 78. Allied to last; type, *B. grandis*, sp. n., *l. c.*, Washington Territory.

Ortholophus, Bigot, *l. c.* p. cxxix. Allied to *Syritta*; type, *O. notatus*, sp. n., *l. c.*, Chili.

Romaleosyrphus, id. *l. c.* Allied to the *Xylotidæ*; type, *R. villosus*, sp. n., *l. c.*, Mexico.

Ptilostylomyia, id. *l. c.* p. cxiv. Differs from *Graptomyza* by the bare chætum. To include *G. gibbula*, Walk., *meliponiformis*, Dol., *brevirostris* and *interrupta*, Wiedem., *literata*, Ost.-Sack., and *triangulifera*, sp. n., *l. c.*, Sierra Leone.

Temnocera recta, Van der Wulp, Tijdschr. Ent. xxv. p. 125, pl. x. fig. 9, Argentine Republic.

Myiolepta obscura, Becker, Wien. ent. Z. i. p. 250, Vienna.

Eristalis unicolor, Van der Wulp, *l. c.* p. 131, pl. x. figs. 11–13, Guadeloupe.

Syrphus sexguttatus, id. *l. c.* p. 135, Argentine Republic.

Sericomyia volucellina, Portschinsky, Hor. Ent. Ross. xvi. p. 137, Caucasus.

Helophilus celeber, Osten-Sacken, B. E. Z. xxvi. p. 116, Philippines.

Milesia semperi, *bigoti*, and *ritsemæ*, id. *l. c.* pp. 189–191, Philippines.

Brachypalpus (?) *pulcher*, Williston, Canad. Ent. xiv. p. 79, Oregon, Washington Territory.

Graptomyza literata and *microdon*, Osten-Sacken, *l. c.* p. 119, Philippines.

Conopidæ.

Conops. North American species discussed, tabulated, and described (several new); Williston, Tr. Conn. Ac. iv. pp. 325-342: the descriptions of unrecognized species are reproduced. *C. vittata*, Fabr., noticed; Costa, Atti Acc. Nap., ix. 6, p. 44.

Ptychoproctus, Bigot, = *Stylomyia*, Westw.; Bigot, Bull. Soc. Ent. Fr. (6) ii. p. xviii.

Conops obscuripennis, Virginia, California, Massachusetts, p. 328, *sylvosus*, Massachusetts, Connecticut, p. 329, *xanthopareus*, Texas, Massachusetts, Connecticut, p. 332, *furcillatus*, White Mountains, p. 336, *burgessi*, Colorado, California, p. 337, *texanus*, Texas, p. 338, *affinis*, Kansas, California, Washington Territory, p. 339, Williston. Tr. Conn. Ac. iv., spp. nn.

Ctenostylidæ.

Ctenostylidæ, fam. n., Bigot, Ann. Soc. Ent. Fr. (6) ii. p. 22. Proposed for the anomalous genus *Ctenostylum*, Macq.; the apparent atrophy of the mouth organs approaches it to the *Œstridæ*, and its pseudo-reticulated wings to the *Nemestrinidæ*: but the preponderance of its characters allies it with the *Conopidæ* and *Myopidæ*.

Œstridæ.

On the nervous system of the *Œstridæ*; Brandt, Troudy Ent. Ross. xii. pp. lvii. & lviii., and Hor. Ent. Ross. xvi. pp. vi. & vii.

Habits of *Œstridæ*; Guillebeau, MT. Ges. Bern, 1881 (2), pp. 7–11.

Horse killed by larvæ of *Œstridæ*; Mégnin, Mém. Soc. Biol. (7) ii. pp. 193-194.

Undetermined botfly attacking the box-turtle (*Cistudo carolina*); Packard, Am. Nat. xvi. p. 598, fig.

Œstrus elephantis, sp. n., Steel, Med. Exam. 1878, p. 886; *Œstrus* of the elephant, Cobbold, Cat. Entozoa Mus. Roy. Coll. Surg. 1866, p. 24; *Gastrophilus elephantis*, Cobb, Tr. L. Soc. (2) ii. pp. 246-248, 255 & 256, fig. 12, in stomach of *Loxodonta africana* and *Elephas indicus*, quite distinct from *Gastrophilus rhinocerotis*, Owen, and *Pharyngobolus africanus*, Brauer.

Muscidæ.

Osten-Sacken & Bigot (Wien. ent. Z. i. pp. 20 & 21) make the following synonymic notes:—*Pollenia stygia*, Fabr. (*Calliphora villosa*, Desv., *Musca australis*, Boisd., *læmica*, White, *indecora*, Walk.); *Calliphora quadrimaculata*, Swed. (*Musca violacea*, Walk., *Calliphora dasyophthalma*, Macq.); *Cephaloconus tenebrosus*, Walk. (*Callistorrhina vittigera*, Big.); *Dryomyza formosa*, Wied. (*gigas*, Voll., *maculipennis*, Macq.); *Rhachiptera limbata*, Big. (? *Percnoptera angustipennis*, Phil.); *Pterocalla ulula*, Loew (*Elaphromyia melas*, Big.); *Cœlometopia trimaculata*, Fabr.,

(*Dacus flavus*, Fabr., *Odontomera maculipennis*) and *Cælometopia ferruginea*, Macq.); *Euchalcota decora*, Macq. (*Ortalis punctifrons*, Macq.).

Cyrtoneura aculeata, Egg., = *curvipes*, Macq.; *C. pilipes*, Rond., = *hortorum*, W., *nec* Rond., which = *simplex*, Loew; *C. penicillata*, Egg., = *Dasyphora versicolor*, Meig., Rond.; *Pyrellia suda*, Rond., and *fasciata*, Gimm., = *ænea*, Zett.; *Gonia viridescens*, Gimm., = *Rhynchomyia speciosa*, Loew; *Dexia petiolata*, Bennersd., = *Dinera cristata*, Meig., Rond.; *Dexia pellucens*, Egg., = *Morphomyia tachinoides*, Fall., Rond.; *Dinera maritima*, Rond., = *Spathomocera picta*, Meig.; *Limnophora scripta*, Now., = *polystigma*, Meig., ♂; *Hydrotæa brevipennis*, Loew, = *velutina*, Zett.; and *Lasiops armipes*, Meig., = *aculeipes*, Zett.: Portschinsky, Hor. Ent. Ross. xvi. p. 145.

Masicera pupiphaga, Rond., = *M. flavo-scutellata*, Zett., = *Tachina bella*, Meig.; *Meigenia bombivora*, Wulp, = *Brachycoma devia*, Fall.; *Theria persica*, Big., = *Sarcophila tetripunctata*, L. Duf., = *S. maxima*, Portsch.; *Aricia carbo*, Schin., = *A. umbratica*, Meig.; *Vetodesia semidiaphana*, Rond., = *Aricia cincta*, Zett.; *Adapsilia picta*, Portsch., = *Pyrgota wagæ*, Big.: *id. op. cit.* xvii. p. 12.

Hylemyia strigosa, F., *Spilogaster divisa*, *Dasyphora pratorum*, Meig., and *Musca corvina*, Fabr., noticed as viviparous; *Cynomyia mortuorum*, L., is oviparous: *id. l. c.* pp. 3–6.

Remarks on the disease myiasis; Löw, Wien. mediz. Wochenschrift, 1882, pp. 248–250.

Dipterous larvæ parasitic on man; Axen and others, Brit. Med. Journ. Oct. 1, 1881, Med. Press & Circular, March and April, 1882, Ent. xv. pp. 164 & 165, Ent. M. M. xix. p. 45.

Limosina pumilio, Meig., and *Homalomyia* sp. Larvæ vomited by a boy at Rotterdam; Veth, Tijdschr. Ent. xxv. p. xiv. Further remarks by Van der Wulp, *l. c.* pp. xiv.–xvi.

Lucilia and *Sarcophila*. Several species noticed by Portschinsky; Troudy Ent. Ross. viii. p. viii.

Phasinæ.

Hyalomyia aurigera, Egg., *H. bonapartea*, Rond., *H. helleri*, Palm., and *Alophora kriechbaumeri*, Schin., are synonymous; Von Röder, B. E. Z. xxvi. p. 386.

Hyalemyia coarctata: note on transformations; Ormerod, J. R. Agric. Soc. (2) xviii. pp. 601 & 602.

Alophora obscuripennis, Meig., = *hemiptera*, Fabr., var.; Poujade, Bull. Soc. Ent. Fr. (6) ii. p. xc.

Gymnosomatinæ.

Gymnosoma rotundatum: larva parasitic during hibernation on a *Pentatoma*; Kunckel, Mém. Soc. Biol. (6) v. p. 385.

Tachininæ.

Echinomyia macularia, Wied., ♂, and *persica*, Portsch., ♀, described; Portschinsky, Hor. Ent. Ross. xvi. p. 174, xvii. p. 11.

Thryptocera bicolor parasitic on *Bombyx quercus*; Bignell, Ent. xv. p. 140.

Microcephalus lœwi, Schin.: habits and locality discussed; Schnabl, Deutsche E. Z. xxvi. pp. 13 & 14.

New genera and species :—

Hystriomyia, Portschinsky, Hor. Ent. Ross. xvi. p. 274. Allied to *Echinomyia*; type, *H. fetissowi*, sp. n., *l. c.* p. 275; add *H. lata*, sp. n., *op. cit.* xvii. p. 6, both from Central Asia.

Sarcotachina, id. *l. c.* xvi. p. 277. Allied to *Macronychia*; type, *S. subcylindrica*, sp. n., *ibid.*, S. Russia.

Pachycheta, id. *l. c.* p. 278. Allied to *Thryptocera*; type, *P. jaroschewsky*[*-skii*], sp. n., *ibid.*, S. Russia.

Tachinella, id. *l. c.* p. 281. Allied to *Tachina* and *Macquartia*; type, *T. meigeni*, sp. n., *ibid.*, W. Russia (? = *Tachina hæmatodes* and *nigripennis*, Meig.).

Pseudalophora, id. *l. c.* p. 282. Placed after *Tachinella*; type, *P. parva*, sp. n., *ibid.*, Caucasus.

Microcephalus neugebaueri, Portschinsky, Hor. Ent. Ross. xvi. p. 137, Switzerland.

Echinomyia brevipalpis, id. *ibid.*, S. Russia; *E. jakovlewi*, Siberia, Amur, p. 7, *danilewsky*[*-skii*], S. Tauria, *albido-pilosa*, Central Asia, p. 8, *popeli*, Volga, p. 9, *balassogloi*, Central Asia, and *erschoffi*, Astrabad, p. 10, *id. op. cit.* xvii.

Phorocera curvinervis, id. *op. cit.* xvi. p. 275, S. Russia.

Pachystylum fasciatum, id. *l. c.* p. 276, S. Russia.

Macquartia olivaceomaculata and *M.* (?) *longipennis*, id. *l. c.* pp. 279 & 280, Caucasus.

Lœwia setigena, id. *l. c.* p. 280, W. Russia.

Jurinia nigriventris, Chili, Argentine Republic, and *nitida*, Arizona, Van der Wulp, Notes Leyd. Mus. iv. pp. 81 & 82.

Nemoræa erythropyga, id. *l. c.* p. 83, Chili.

Belvosia leucopyga, id. *l. c.* p. 84, Brazil.

Masicera insignis, id. *l. c.* p. 85, Chili.

Dexinæ.

Phorostoma nigrifasciatum, Portschinsky, recharacterized by him, Hor. Ent. Ross. xvi. p. 138.

Phorostoma parvula[*-lum*], Volga, and *intermedia*[*-ium*], spp. nn., Caucasus, *id. l. c.* pp. 138 & 139.

Dexia biserialis (? = *marmorata*, Meig.) and *D.* (?) *masiceræformis*[*-rif-*], spp. nn., *id. l. c.* pp. 139 & 283, Caucasus.

Zeuxia latifrons, sp. n., *id. l. c.* p. 140, Caucasus.

Syntomocera tricolor, p. 140, *acuta*, and *angustifrons*, p. 141, *id. l. c.*, Caucasus, spp. nn.

Sarcophaginæ.

Sarcophila tetripunctata, Duf. (= *maxima*, Portsch.), and *Sarcophaga*

maculata, Meig. (= *matertera*, Rond.), noticed; Portschinsky, Hor. Ent. Ross. xvi. pp. 283 & 284.

Sarcophaga atropos, Meig., ♂, and *ruralis*, Fall. (*nec* Meig.). Larvæ described; *id. op. cit.* xvii. p. 5.

Sarcophila ruralis, Fall., Zett. (*nec* Meig.), redescribed; *id. op. cit.* xvi. pp. 141 & 142.

Sarcophila megacephala and *balassogloi*, spp. nn., *id. l. c.* p. 142, Orenburg, &c.

Muscinæ.

PRIMA, F. Considerations sur la *Lucilia hominivora*, observations recueillies à la Guyane française. Paris: 1882, 8vo, pp. 47.

[Not seen by the Recorder.]

VIALLANES, H. Note sur la structure et la developpement des centres nerveux et de l'appareil visuel des Insectes. Bull. Soc. Philom. (7) vi. pp. 210–214.

On examining a transverse section of the head of a fully developed pupa of *Musca vomitoria*, the following parts are visible:—1. The compound eye; 2. The post-retinal layer of fibres; 3. The ganglionic layer; 4. The layer of pre-ganglionic fibres; 5. The optic ganglion. The manner in which the compound eye is gradually formed, from the rudimentary structure existing in the larva, is also described.

Anthrax in New Caledonia attributed to *Stomoxys*, &c.; Macleay, P. Linn. Soc. N. S. W. vii. pp. 202–205.

Cyrtoneura stabulans. Parasitic on *Aletia argillacea*; Meade, Ent. xv. p. 141. It probably infests only rotten pupæ; Riley, Am. Nat. xvi. pp. 746 & 747.

Musca domestica abundant in uninhabited districts, but destroyed by *Vespa occidentalis*, Cress.; Snow, Psyche, iii. p. 339.

Parasites on "bluebottle flies;" Maceo, Sci. Goss. xviii. p. 47.

Lucilia nosocomiorum, Dol., probably = *fortunata*, Walk.; Osten-Sacken, B. E. Z. xxvi. p. 193.

Glossina morsitans, Westw. Distribution in Loango; Güssfeldt, Loango Expedition, ii. pt. ii. p. 299.

Cyrtoneura minor, sp. n., Portschinsky, Hor. Ent. Ross. xvi. p. 143, Caucasus.

Dasyphora æneo-micans, Caucasus, xvi. p. 143, xvii. p. 4, and *viridescens*, Transcaucasia, xvii. p. 4, *id. l. c.*, spp. nn.

Pollenia dasypoda, sp. n., *id. op. cit.* xvi. p. 143, Caucasus.

Calliphora phacoptera (Phil., MS.), sp. n., Van der Wulp, Notes Leyd. Mus. iv. p. 88, Chili.

Anthomyiinæ.

MEADE, R. H. Annotated list of British *Anthomyiidæ* (continued). Ent. M. M. xviii. pp. 172–175, 201–205, 221–224, 265–270, xix. pp. 29–33, 145–148.

The genera discussed are *Drymia*, Meig., *Pogonomyia*, Rond., *Ophyra* Desv., *Trichopticus*, Rond., *Homalomyia*, Bouché, *Piezura*, Rond.,

Azella, Desv., *Cælomyia*, Hal., *Hylemyia*, Desv., *Lasiops*, Meig., *Anthomyia*, Meig., and *Chortophila*, Macq.

On leaf-mining *Anthomyiidæ*; Lintner, Canad. Ent. xiv. pp. 96 & 97.

Anthomyia floralis and allies noticed, with hints for their destruction; Ormerod, J. Agric. Soc. (2) xviii. pp. 602 & 603. *A. betæ* noticed, Gard. Chron. (2) xv. [1881] pp. 438, 439 & 796, fig.

New genera and species:—

Ytodesia, Bigot, Ann. Soc. Ent. Fr. (6) ii. p. 13 (= *Aricia*, Desv.; Rond.) First transverse nervure placed before the extremity of the second longitudinal; second transverse nearer the first than the extremity of the fifth longitudinal. (The types of this and the following genera are not indicated.)

Parapsilogaster, id. *l. c.* p. 15 (= *Spilogaster*, pt., Schin., Rond.). Abdomen usually dotted, first segment relatively very short.

Syllegoptera, id. *l. c.* p. 16 (? = *Zabia*, Desv., Rond.). Third joint of antennæ comparatively short, not reaching the epistoma; femora not swollen.

Paranthomyia, id. *l. c.* p. 17 (= *Anthomyia*, pt., Rond., Schin.) Seventh longitudinal nervure extending to the margin, axillary nervure nearly straight, cheta tomentose or naked.

Parmalomyia, id *l. c.* p. 18 (= *Homalomyia*, pt., Desv., Schin., *Cælomyia*, Hal., *Myiantha*, pt., Desv.), cheta naked, four hind tibiæ provided with macrochetæ besides the apical ones.

Parazelia, id. *l. c.* p. 18 (= *Azelia*, pt., Desv., Rond.). Cheta naked; four hind tibiæ naked, except the apical macrochetæ.

Parachortophila, id. *l. c.* p. 21 (= *Chortophila*, pt., Rond.). Second transverse nervure scarcely or not at all oblique; ♂ organ thickened, or provided with prominent lobes.

Dasyphyma, id. Bull. Soc. Ent. Fr. (6) ii. p. clxxxviii. Allied to *Ophyra*; hind femora much curved, with a strong tooth, densely ciliated, at the tip beneath. Type, *D. armata*, sp. n., *l. c.*, Chili.

Hydrotæa meridionalis, Portschinsky, Hor. Ent. Ross. xvii. p. 3, Tauria.

Limnophora calcarata, id. *l. c.* xvi. p. 144, Caucasus.

Trichopticus pulcher and *rostratus*, Meade, Ent. M. M. xviii. pp. 175 & 176, England.

Homalomyia spissata, ? = *armata*, Macq., *nec* Meig.; *id. l. c.* p. 203, Buckingham.

Dryomyzinæ.

Neottiophilum, Frauenf., discussed; the type is *Dryomyza præusta*, Meig. (= *N. fringillarum*, Frauenf., = *Blepharoptera cartereaui*, Big.). Mik, Wien. ent. Z. i. pp. 194–197.

Tetanocerinæ.

Sepedon juvenis, Desv. Variation discussed; Osten-Sacken, B. E. Z. xxvi. p. 193.

Adapsilia picta, sp. n., Portschinsky, Hor. Ent. Ross. xvi. p. 144, Caucasus.

Micropezinæ.

Micropezidæ. Chætotaxy described; *Nothybus*, *Grammicomyia*, *Teleostylus* (*Canurgia remipes*, Walk., = *T. binotatus*, Big.), and *Anaropsis* (*A. lorquini*, Big., = *Phytalmia guttipennis*, Walk.), Big., and *Taniopteræ*, Macq., described; these and other genera, and the Eastern species of *Calobata*, Meig., tabulated; Osten-Sacken, B. E. Z. xxvi. pp. 194–201.

Telostylus, Bigot, has priority over *Canurgia*, Walk.; Bigot, Bull. Soc. Ent. Fr. (6) ii. p. xviii.

Eurybata, g. n., Osten-Sacken, B. E. Z. xxvi. p. 204. Allied to *Nostima*, Ost.-Sack., but the upper portion of the metanotum is separated by a groove from the lower, and has the shape of a transverse swelling, and not of a cone. Type, *E. hexapla*; add *E. semilauta* (? = *Micropeza fragilis*, Walk.), spp. nn., *l. c.* pp. 206 & 207, Philippines.

Telostylus maccus, sp. n., *id. l. c.* p. 207, Philippines.

Calobata (*Taniopteræ*) *chrysopleura*, p. 201, *C.* (*T.*) *galbula*, p. 202, *monedula* and *territa*, p. 203; *id. l. c.*, Philippines: spp. nn.

Ortalinæ.

Osten-Sacken recharacterizes his genera *Antineura*, *Philocompus*, *Xenaspis*, *Naupoda*, and *Asyntoma*; B. E. Z. xxvi. pp. 213–223.

Trachycephala, Dol. (pre-occupied), renamed *Notopsila*; id. *l. c.* p. 209.

Stenopterina. Table of species of the Malay Archipelago, with notes on several; *id. l. c.* pp. 211–213.

Carlottamyia mœrens, Bigot, = *Diacrita costalis*, Loew; Bigot, Bull. Soc. Ent. Fr. (6) ii. p. xviii.

Zygothrica, Wied. Orthography of name discussed; Mik, Wien. ent. Z. i. pp. 63 & 64.

New species:—

Notopsila sexpunctata and *curta*, Osten-Sacken, B. E. Z. xxvi. p. 210, Philippines.

Antineura stolata, fig. 3, and *sericata*, id. *l. c.* pp. 215 & 216, Philippines.

Philocompus cupidus, id. *l. c.* p. 217, fig. 4, Philippines.

Xenaspis polistes, id. *l. c.* p. 220, fig. 5, Philippines.

Naupoda platessa, id. *l. c.* p. 223, fig. 6, Philippines.

Asyntoma doleschalli, id. *l. c.* p. 224, fig. 7, Philippines.

Trypetinæ.

Characters of *Rioxa*, Walk., *Ptilona* and *Henicoptera*, Macq., discussed; *Trypeta paritii*, Dol., probably = *modesta*, Wied.; Osten-Sacken, B. E. Z. xxvi. pp. 226, 227, & 232.

Trypeta pomonella, Walsh. Life-history; Comstock, Rep. Ins. 1881, pp. 3–6. pl. xiv., and Riley, Rep. Ins. 1882, pp. 195–198, pl. xiv.

Myopites inulæ, Roser, and *Urophora macrura*, Loew, noticed as new to Britain; Fitch, Ent. xv. pp. 138 & 139.

Anomœa antica, Wied., and *Urellia* (*Tephritis*) *eluta*, Meig., noticed; Handlirsch, Wien. ent. Z. i. p. 269.

Dacus icarus, sp. n., Osten-Sacken, B. E. Z. xxvi. p. 224, fig. 8, Philippines.

Trypeta cassandra, p. 228, *alkestis* [sic], p. 229, and *manto*, p. 231, *id. l. c.* figs. 9–11, Philippines, spp. nn.

Henicoptera proditrix, sp. n., *id. l. c.* p. 233, Philippines.

Urophora diaphana, sp. n., Van der Wulp, Notes Leyd. Mus. iv. p. 90, Isle St. Martin.

Myiopites sardoa, sp. n., Costa, Atti Acc. Nap. ix. 11, p. 40, Sardinia.

Diopseinæ.

Philippine species tabulated: *Sphyrocephala*, Say, discussed, and known species tabulated ; Osten-Sacken, B. E. Z. xxvi. pp. 233–238.

Diopsis argentifera, Big., = *abnotata*, Westw. ; *id. l. c.* p. 237.

Teleopsis motatrix and *selecta*, spp. nn., *id. l. c.* p. 236, figs. 12 & 13, Philippines.

Piophilinæ.

Piophila atrata, Meig. Transformations described ; Jacobs, CR. Ent. Belg. xxvi. pp. cxxiv. & cxxv.

Psilinæ.

Platystyla hoffmannseggi, Meig., discussed ; Von Röder, B. E. Z. xxvi. pp. 384 & 385.

Chyliza selecta, sp. n., Osten-Sacken, *l. c.* p. 193, Philippines.

Chloropinæ.

Eurhina lurida and *clypeata*, Meig., are probably varieties ; Von Röder, S. E. Z. xliii. p. 511.

Oscinis dimorpha, sp. n., Osten-Sacken, B. E. Z. xxvi. p. 245, Philippines.

Ephydrinæ.

Discomyza incurva, Fall., noticed as new to Britain ; Billups, P. E. Soc. 1882, p. xiv.

Dryxo, Desv., recharacterized ; Osten-Sacken, B. E. Z. xxvi. pp. 238–241.

Dryxo digna and *spreta*, spp. nn., *id. l. c.* pp. 241 & 242, Philippines.

Drosophilinæ.

Drosophila ampelophila, Löw, pp. 6–9, and *amœna*, Löw, pp. 9 & 10: life-history ; Comstock, Rep. Ins. 1881, pls. xv. & xvi. ; also Riley, Rep. Ins. 1882, pp. 198–202, pls. xv. & xvi. *D. ampelophila*, Löw: transformations described and figured ; Bowles, Canad. Ent. xiv. pp. 101–104, figs. 10 & 11. *Cf.* also Williston, *tom. cit.* pp. 137 & 138.,

Drosophila hypocausta, sp. n., Osten-Sacken, *l. c.* p. 245, Philippines.

Geomyzinæ.

Diplocentra, Löw. (= *Cyrtonotum*, Macq.), recharacterized ; Osten-Sacken, B. E. Z. xxvi. pp. 243 & 244.

Diplocentra arenata, sp. n., *id. l. c.* p. 244, Philippines.

Heterochroa pictipennis, sp. n., Van der Wulp, Notes Leyd. Mus. iv. p. 91, Chili.

HIPPOBOSCIDÆ.

Lipoptena cervi, var. *alcis* parasitic on elk described; Schnabl, Deutsche E. Z. xxvi. p. 13. *Cf.* also Mik, Wien. ent. Z. i. pp. 64 & 65

Lynchia, g. n., Weyenbergh, An. Soc. Arg. xi. [1881] p. 195. Intermediate between *Ornithomyia* and *Olfersia*; antennæ gemmiform [moniliform ?], long, setose, inserted on the sides of the hypostoma. Ocelli absent; ungues tridentate, wings broad, incumbent, much longer than the abdomen, and acuminate. Type, *M. penelopes*, sp. n., *l. c.* p. 199, Tucuman.

Nycteribia flava, sp. n., *id. l. c.* p. 194, Cordoba.

BRAULIDÆ.

Braula cæca described and figured; Fedarb, Sci. Goss. xvii. pp. 108–110, figs. 69–74.

(APHANIPTERA.)

PULICIDÆ.

Pulex feeding on the larvæ of *Tinеina*; Boden, Ent. xv. p. 70. *P. irritans*: oviposition, &c.; Scott, Sci. Goss. xviii. p. 9.

Sarcopsylla penetrans, Westw.: distribution in Loango. It is said to have been introduced by an English ship from Rio in 1872; Güssfeldt, Loango Expedition, iii. pt. ii. pp. 297 & 298 [long recorded by the late J. J. Monteiro, in his work "Angola and the River Congo," London: 1875.—ED.]. Noticed by White, Cameos from the Silver Land, ii. pp. 426 & 427.

NEUROPTERA.

BY

ROBERT MCLACHLAN, F.R.S., F.L.S., &c.

THE GENERAL SUBJECT.

COOKE, BENJAMIN. Contribution to a List of the *Neuroptera* (in the Linnean sense) of Lancashire and Cheshire. Naturalist, vii. pp. 110, 111, 121, & 122.

Enumerates 39 *Trichoptera*, 17 *Planipennia*, and 47 *Pseudo-Neuroptera*.

JAROSHEVSKY, W. A. *Neuroptera* of Kharkoff. Tr. Soc. Nat. Kark. Univ. xv. [In Russian. The Recorder has only seen a separate copy, pp. 1–11, dated 1881.]

Enumerates 37 species of *Odonata*, 3 *Ephemeridæ*, 1 *Perlidæ*, 2 *Panorpidæ*, 7, *Trichoptera*, 2 *Sialidæ*, and 9 *Megaloptera*.

KING, J. J. Notes on the *Neuroptera* of Strathglass, Inverness-shire. Ent. M. M. xix. pp. 8–12.

In July and August 111 species were observed, viz., 63 *Trichoptera*, 13 *Planipennia*, and 35 *Pseudo-Neuroptera*.

——. Notes on the *Neuroptera* of Langdale. *L. c.* pp. 82–84.

A contribution to the fauna of the English Lake District. In August 83 species were obtained, the majority of which were *Trichoptera*.

MCLACHLAN, ROBERT. The *Neuroptera* of Madeira and the Canary Islands. J. L. S. xvi. pp. 150–183.

In consequence of having to examine a collection made by the Rev. A. E. Eaton in these islands at the end of the year 1880, the author put together all that was known on the subject. The paper commences with a bibliographical sketch, followed by a tabular analysis. 53 species are known from the islands, 37 are found in Madeira, 31 in the Canaries, and 16 are common to both: of these 19 are known inhabitants of Europe proper; the purely African element is small; about 25 species appear to be endemic. The list comprises 14 *Trichoptera*, 15 *Planipennia*, and 24 *Pseudo-Neuroptera* (2 *Termitidæ*, 6 *Psocidæ*, 2 *Ephemeridæ*, and 14 *Odonata*); cf. Ent. xv. p. 48.

Majewski, Erazm. Insecta *Neuroptera* Polonica. Warszawa : 1882, pp. 1–42.

The Latin title of a name-list (with localities, &c.) in the Polish language, preceded by an introduction of 13 pp. Judging from the names and occasional synonymy it is of a crude nature, compiled from various discrepant sources. It professes to include all the species (sens. Linn.). One feature is that the author has coined a vernacular name for each genus.

Gryllacris bohemica, Novák, belongs to *Lithosialis* ; Scudder, P. Bost. Soc. xxi. p. 167.

A list of species in all families taken in Limburg, is given by A. H. Maurissen in Tijdschr. Ent. xxv. Verslag, pp. cxix. & cxx.

A list of 16 species taken in the island of Sardinia in September, 1881, by Achille Costa, is given in Atti Acc. Nap. ix. p. 22.

Popular notes "On the Linnæan Order *Neuroptera*" are given by J. J. King in Ent. xv. pp. 25–30.

Trichoptera.

McLachlan, Robert. A Revised List of British *Trichoptera* brought down to date ; compiled with especial regard to the "Catalogue of British *Neuroptera*," published by the Society in 1870. Tr. E. Soc. 1882, pp. 329–334.

Enumerates (with special synonymy in some cases) 152 species, 20 of which have been added since 1870, and 30 since 1865.

——. On a Marine Caddis-fly (*Philanisus*, Walker, = *Anomalostoma*, Brauer) from New Zealand. J. L. S. xvi. pp. 417–422, woodcuts; *cf.* Ent. M. M. xviii. p. 278, xix. p. 46.

An insect bred by Hutton lives in the larva state in rock-pools in New Zealand, and constructs tubular cases of coralline sea-weed. It is identified with *Philanisus plebeius*, Walker, and according to the larva and case *Philanisus* should be transferred to the *Leptoceridæ* as an abnormal form. The figures represent the larva, case, and fragments of an imago on the point of emergence.

Meyer-Dür, L. R. Uebersichtliche Zusammenstellung aller bis jetz in der Schweiz einheimisch gefundenen Arten der Phryganiden. MT. schw. ent. Ges. vi. pp. 301–333.

Supplementary (so far as the *Trichoptera* are concerned) to the author's "Neuropteru-Fauna der Schweiz," 1874–5, the nomenclature based upon that of McLachlan's "Revision and Synopsis." Much additional local information is given, with valuable critical notes, but no new species are described. 206 species are enumerated as pertaining to the Swiss fauna. An analysis of these according to families gives the following results:—9 *Phryganeidæ*, 78 *Limnophilidæ*, 19 *Sericostomatidæ*, 30 *Leptoceridæ*, 32 *Hydropsychidæ*, 28 *Rhyacophilidæ*, and 10 *Hydroptilidæ*. About 87 species have been apparently added since his previous list (1875), but

the actual number is by no means so great, the discrepancy resulting from synonymic causes.

Important local lists of British species are given by J. J. King in Ent. M. M. xix. pp. 9–11, 83 & 84.

The Recorder, in exhibiting a block of indusial limestone from Auvergne, stated as his belief that the rock was mainly (as has always been supposed) composed of the shell-covered cases of caddis-worms, which must have pertained to the *Limnophilidæ*, and perhaps to *Limnophilus* itself. The formation was assigned by geologists to the Upper Eocene Period, but no fossil remains of the perfect insects of *Limnophilidæ* were known from so old a period, and from a purely entomological point of view he would be inclined to consider it of very much later date. P. E. Soc. 1882, p. xviii.

Phryganeidæ.

Phryganea obsoleta very abundant in Inverness-shire; a ♀ was observed to descend below the surface of the water three times to a depth of about eighteen inches, apparently for oviposition; J. J. King, Ent. M. M. xix. p. 9.

Limnophilidæ.

Mesophylax, g. n., McLachlan, J. L. S. xvi. p. 157. Allied to *Stenophylax*, but differs in the spur of the anterior tibiæ of the male being very minute, without any reduction in the length of the corresponding tarsal joint; includes *Stenophylax oblitus*, Hag., and *S. aspersus*, Ramb., with var. n. *canariensis* (p. 157), from Grand Canary.

Sericostomatidæ.

Helicopsyche sperata, McLach. De Rougemont's memoirs on this insect [*cf.* Zool. Rec. xvi. *Ins.* p. 204, & xvii. *Ins.* p. 199] are reproduced (with plate) in MT. schw. ent. Ges. vi. pp. 261–284, following an obituary notice of the author by Maurice de Tribolet.

Leptoceridæ.

Setodes argentipunctella, McLach., very abundant near Ambleside; J. J. King, Ent. M. M. xix. p. 84. Notes on the distribution of the species; McLachlan, *l. c.* p. 21.

Molanna palpata, McLach., occurs in Perthshire; J. J. King, Ent. M. M. xix. p. 67.

Hydropsychidæ.

Tinodes grisea, Hag. McLachlan describes what he believes to be the male; J. L. S. xvi. p. 159.

Tinodes canariensis (p. 159), Canaries, and *merula* (p. 160), Madeira, spp. nn., McLachlan, *l. c.*

Ecnomus. A new species indicated (without name) from Belgium and Portugal; *id.* CR. Ent. Belg. xxvi. p. lxxviii.

Rhyacophilidæ.

Rhyacophila meyeri, McLach., and a new species, recorded from the Val Anzasca; McLachlan, P. E. Soc. 1882, p. xviii.

Hydroptilidæ.

Hydroptila. A new species obtained near Ambleside, England; J. J. King, Ent. M. M. xix. p. 84. A probable new species from the Canaries noticed by McLachlan, J. L. S. xvi. p. 161.

Hydroptila atra, Hagen, is a *Stactobia*; id. *ibid.*

NEUROPTERA-PLANIPENNIA.

Panorpidæ.

OSTEN-SACKEN, C. R. Ueber das Betragen des californischen flügellosen *Bittacus* (*B. apterus*, McLach.). Wien. ent. Z. i. pp. 123 & 124.

Concerns the habits of this creature, according to personal observation. It is acrobatic, and can swing itself from one grass-stem to another, often hanging by the anterior tarsi. Its apterous condition is, perhaps, best suited to the windy district it inhabits. With it occurs a semi-apterous form of *Tipula* (*T. præcisa*, Löw, var.). [*Cf.* Am. Nat. xvi. p. 596.]

Panorpa picta, Hagen. The species given under this name by McLachlan in 1869 is probably distinct, and should take the name *P. nigrirostris*, Zeller, MS.; McLachlan, Ent. M. M. xix. p. 132.

Bittacus tipularius. Laboulbène announces the capture of this insect at St. Denis d'Anjou, France, and explains the method by which it attaches itself to grass-stems by means of the terminal joints of the tarsi; Bull. Soc. Ent. Fr. (6) ii. pp. cxxxiii. & cxlviii.

Boreus hiemalis, L., in the Departement de l'Aisne, France; E. Simon, *l. c.* p. clxxiii.

Panorpa hybrida, sp. n., McLachlan, Ent. M. M. xix. pp. 130–132, woodcuts, Oesel, Finland, and Saxony.

Rhaphidiidæ.

Rhaphidia xanthostigma, Schum. The larvæ found in the galleries of *Synoxylon muricatum*, F., in vine-stems; F. A. Wachtl, Wien. ent. Z. i. p. 276.

Mantispidæ.

BOLIVAR, IGNACIO. Sobre la estructura de las patas pressores de la *Mantispa perla*, Pall. An. Soc. Esp. xi. pp. 35–40, woodcuts.

Points out the real structure of the anterior legs, but contains nothing new, the descriptions in the authors mentioned having long been known as erroneous.

Osmylidæ.

Osmylus langi and *multiguttatus*, McLach., figured in C. O. Waterhouse's Aid to Identification, the former on pl. lxxi., the latter on pl. xc.

Hemerobiidæ.

Hemerobius elegans, Steph., in Grand Canary; McLachlan, J. L. S. xvi. p. 162. Notes on other species of the genus; *id. ibid.*

Psectra diptera, Burm. Note on an example from Italy, with general remarks on distribution, etc.; McLachlan, CR. Ent. Belg. xxvi. p. lxxvii.

Chrysopidæ.

SAUNDERS, WILLIAM. On the mouth of the larva of *Chrysopa*. Am. Nat. xvi. pp. 825 & 826.

The larva thrusts its mandibles into the body of an *Aphis*, and proceeds to pump it dry, in which it is aided by a sac-like dilatation at the base of each mandible; when the abdomen is emptied, the mandibles are thrust into the head and thorax, and in a few moments nothing remains but the empty skin.

Chrysopa minima, Kiljander, = *C. dasyptera*, McLach.; McLachlan, Ent. M. M. xix. p. 117.

Chrysopa flaviceps, Brullé, redescribed from the original type; McLachlan, J. L. S. xvi. p. 168.

Chrysopa fortunata (p. 164), Canaries, *subcostalis* (p. 166), Canaries, and *atlantica* (p. 167), Canaries and Madeira, spp. nn., McLachlan, *l. c.*

Ascalaphidæ.

Two described species are figured in C. O. Waterhouse's Aid to Identification, i., viz., *Helcopteryx rhodiogramma*, Ramb., pl. lxvii., and *Ascalaphus ramburii*, McLach., pl. xcix.

Myrmeleonidæ.

Myrmeleon formicarius, L., erroneously quoted by Kiljander as a British species; McLachlan, Ent. M. M. xix. p. 117.

Myrmeleon distinguendus, Rbr. *M. hyalinus*, Brullé (from the Canaries), is believed to be identical, according to an examination of the type. A description of examples from Portugal is given; McLachlan, J. L. S. xvi. p. 172.

DEWITZ, H. Mundtheile der Larve von *Myrmeleon*. B. E. Z. xxvi. pp. 61–66.

An expansion of the author's previous notes on the subject (*cf.* Zool. Rec. xviii., *Ins.* p. 259), elucidated by diagrams.

Coniopterygidæ.

SCHLECHTENDAL, D. H. R. VON. *Coniopteryx psociformis*, Curtis, als Schmarotzer in Spinneneiren. JB. Ver. Zwickau, 1882. [Only separate copy seen, pp. 1–6, with one plate.]

An important biological paper. The author found, in the middle of March, under bark of oak, nests of spiders (*Philodromus*, &c.), in which, instead of eggs, were the larvæ of *C. psociformis* (which were themselves frequently the prey of a hyper-parasitic Proctotrypid). They changed to pupæ in the beginning of April (indoors), and the imagos appeared in the middle of the same month. A critical description of the imago is

given, and also of the larva, and a very full account of the manner of pupation, the whole illustrated by excellent figures. The author is of opinion that, in early life, the larva may live upon *Coccidæ* (as is said to be the case with *C. tineiformis*), and subsequently transfer itself to the spiders' nests.

New forms from Switzerland alluded to; McLachlan, P. E. Soc. 1882, p. xviii.

Coniopteryx pulchella, sp. n., McLachlan, J. L. S. xvi. p. 173, Canaries.

Pseudo-Neuroptera.

Thysanura.

Brook, George. On a new genus of *Collembola* (*Sinella*), allied to *Degeeria*. J. L. S. xvi. pp. 541–545, woodcuts.

A detailed paper, in which points of general interest occur.

Parona, C. Di alcune *Collembola* e *Thysanura* raccolte dal Prof. P. M. Ferrari con cenno corologica della Coll. e Thys. italianæ. Ann. Mus. Genov. xviii. pp. 453–464. [*Cf.* Bull. Ent. Ital. xv. p. 189.]

In noticing certain species collected at Stazzano, the author gives a new list of Italian species, enumerating 50 *Collembola* and 11 *Thysanura*.

Rossi, Gustav de. Zur Lebensweise der *Lepisma saccharina*, L. Ent. Nachr. viii. pp. 22 & 23 (translated in Ent. M. M. xix. p. 22).

This creature may be injurious in various ways, and to the entomologist in particular, by destroying specimens and damaging the paper in boxes, &c.

Lepisma saccharina very destructive to books, papers, &c., in New South Wales; A. Liversidge, J. R. Micr. Soc. (2) ii. p. 500.

Gustav Joseph, in a general memoir on the *Arthropoda* of the caves of Carniola (B. E. Z. xxvi. pp. 24–30), describes numerous new species, and indicates the following known species as inhabitants, viz.:—*Dicyrtoma pygmæa*, Wankel, *Tritomurus scutellatus*, Frauenf., and *T. macrocephalus*, Kolenati, *Heteromorus margaritaceus*, Wankel, *Cyphoderus albinus*, Nic., *Anurophorus stillicidii*, Schiödte, *A. gracilis*, Müll., and *A. ambulans*, De Geer. Some apparently novel ideas of classification into "families" and "sub-families" are presented.

New genera:—

Tetrodontophora, Reuter, Anz. Ak. Wien, xix. p. 173; noticed, no species described.

Troglodromius, Joseph, *l. c.* p. 24. Allied to *Lepisma*; type, *T. cavicola*, sp. n., p. 25, Carniola.

Sinella, Brook, *l. c.* p. 541. Differs from all described *Collembola* with one exception, in having two eye-patches on each side; type, *S. curviseta*, sp. n., p. 544, England.

New species :—

Machilis bruneo-flava [sic], Joseph, *l. c.* p. 24, Carniola.
Nicoletia cavicola, id. *l. c.* p. 25, Carniola.
Campodea nivea, id. *ibid.*, Carniola.
Iapyx forficularius (cf. also SB. schles. Ges. lix. p. 254) and *cavicola*, id. *l. c.* p. 26, Carniola.
Smynthurus niveus, *longicornis*, *gracilis*, p. 27, and *cæcus*, p. 28, *id. l. c.*, Carniola.
Isotoma (*Desoria*) *spelæa*, id. *l. c.* p. 29, Carniola.
Achorutes spelæus, id. *ibid.*, Carniola.
Tomocerus niveus, id. *ibid.*, Carniola.
Cyphoderus monocerus, id. *ibid.*, Carniola.
Anurophorus cæcus, id. *l. c.* p. 30, Carniola.
Anura infernalis, id. *ibid.*, and *hirta*, p. 31, Carniola.

Mallophaga.

Simonetta, Luigi. Elenco sistematico del Pediculini appartenuneti al Museo Zoologico della R. Università di Pavia. Bull. Ent. Ital. xiv. pp. 204-220 [*cf.* Zool. Rec. xviii. *Ins.* p. 260].

Excluding the three ordinary human lice, there are enumerated 11 species of *Docophorus*, 11 of *Nirmus*, 1 of *Goniodes*, 4 of *Lipleurus*, 1 of *Colpocephalum*, 9 of *Menopon*, 1 of *Trinoton*, and 1 of *Lœmobothrium*. The notes give important information concerning the "hosts."

Thysanoptera.

Habits of *Thrips*. Herbert Osborn, Psyche, iii. p. 369, is of opinion that these insects cause much damage to fruit and other trees by devouring the style in unopened buds, and thus preventing fertilization ; in 80 per cent. of unopened buds the style was found to be more or less injured. Theodor Pergande, *l. c.* p. 381, thinks this idea exaggerated, and that the secreted nectar is the main object sought ; moreover, he believes they materially assist in fertilization. Furthermore some species are carnivorous, and destroy *Acari*, &c., that infest certain plants. He mentions that on the 14th November he found *Heliothrips hæmorrhoidalis*, Bouché, very lively on leaves of apple in an orchard, and he discovered *H. dracænæ*, Heg., in a conservatory in America.

Heliothrips destructive to fuchsia ; E. Lefevre, Ent. xv. p. 240.

Termitidæ.

Baumann, E. Chemische Untersuchung von Bruchstücken einer von Hrn. Reuleaux aus Australien mitgebrachten Ameisen oder Termiten-nestes. SB. Ak. Berl. 1882, pp. 419–424 (with introductory remarks by E. Du Bois-Reymond), woodcuts.

The nest, of which a portion was analyzed, was found at Somerset, N. Australia ; it then contained ants, but was believed to have been origin-

ally the work of *Termites*. A comparison is given with the results obtained by analyses made by other experimenters.

S. E. Peal, according to observations made in Assam, is of opinion that the substance of which the inner cells of a termitarium is composed, consists of the excreted refuse of the wood on which they feed. Diagrams of sections of nests are given; Nature, xxvi. p. 343.

When the galleries of white ants are formed on the surface of glass, it is found that the surface is eroded as if by some powerful chemical action; G. Bidie, Nature, xxvi. p. 549.

Leidy's memoir on the parasites of *Termitidæ* is abstracted in Kosmos, xi. p. 50 [*cf.* Zool. Rec. xviii. *Ins.* p. 261].

Embiidæ.

Embia solieri, Ramb., captured in the larval state under stones at Amélie-les-Bains; H. Lucas, Bull. Soc. Ent. Fr. (6) ii. p. clxxxv.

Psocidæ.

Bertkau, P. Ueber einen auffallenden Geschlechts-dimorphismus bei Psociden, nebst Beschreibung einiger neuer Gattungen und Arten. Arch. f. Nat. xlix. pp. 97–101, pl. i.

——. Ueber den Geschlechtsdimorphismus und die Speicheldrüsen der Psociden. Verh. Ver. Rheinl. xxxix. pp. 127–133.

Contains also synonymical corrections to his previous paper, and a list of 26 species found near Bonn.

Hagen, H. A. Beiträge zur Monographie der Psociden. S. E. Z. xliii. pp. 265–276 & 217–237 (under the title "Ueber Psociden in Bernstein"), 276–300 & 524–526 (Erklärung der Tafeln), pls. i. & ii. (folded). [An editorial note at p. 265 explains how this error in sequence occurred.]

An amplification of the species of *Psocidæ* found in amber, described or noticed by the author in Berendt's "Organische Reste im Bernstein," in 1845 (including Pictet's species), with notices of much further materials (including new genera and species), from Künow's collection. The previously known species are redescribed in great detail. Some comparative tables follow, showing the gradual increase of materials observed. The memoir concludes with a lengthened critique of Kolbe's recent Monograph, so far as regards certain views expressed by that author regarding the oldest forms of *Psocidæ* in an evolutionary sense, the forms with abbreviated wings are considered examples of atavism, and there are also allusions to points of structure, some of which had previously appeared in the author's paper in "Psyche" [*cf.* Zool. Rec. xxiii. *Ins.* pp. 261 & 262]. The plates are mostly occupied by details, and are not entirely confined to illustrations of amber species. On pl. i. are figured:—*Psocus affinis* (fig. 1), *Caecilius proavus* (fig. 2), *C. pilosus* (fig. 3), *C. debilis* (fig. 4), *Epipsocus ciliatus* (fig. 5), *Amphientomum paradoxum* (fig. 6), *Elipsocus abnormis* (fig. 7), *Empheria reticulata* (fig. 8), *E. villosa*

(fig. 9), *Archipsocus puber* (fig. 10), *Psocus tener* (fig. 11). Pl. ii. applies partly to the author's monograph of the *Atropina* (published in 1883), it includes:—*Sphæropsocus kunowi* (fig. 1), *Atropos succinica* (fig. 3), *Hyperetes tessulatus*, from N. America (fig. 2), *Atropos divinatoria* (fig. 4), *A. resinata* (fig. 5), *Clothilla inquilina* and *annulata*, from N. America (figs. 6 & 7), *Tropusia* (*Atropos*) *oleagina* (fig. 8), and *Atropos formicaria* (fig. 9).

KOLBE, H. Neue Psociden der paläarktischen Region. Ent. Nachr. viii. pp. 207–212.

Stated to be supplementary to the author's "Monographie der deutschen Psociden" (1880). Contains descriptions of new genera and species, with notes and tabular diagnoses concerning others already described.

——. Das phylogenotische Alter der europäischen Psocidengruppen. JB. westf. Ver. x. pp. 18–27.

An ingenious and speculative essay. The genus *Amphientomum*, Hag., is considered the earliest representative of the *Psocidæ* (according to materials discovered). The *Atropina* are degenerative. The imago state of the older groups corresponds with the nymph-stage of the younger, and vice versâ, according to the laws of Ontogeny. A multitude of minute characters are given in support of the author's theory. The family is divided into three "Sections":—i. *Progenesia* (subdivided into the "tribes" *Neurosemini*, *Calopsocini*, *Perientomini*, *Polypsocini*, *Dypsocini*, *Caeciliini*, *Hemipsocini*, and *Stenopsocini*); ii. *Holophania*, with, for tribes *Thyrsophorini*, *Psocini*, *Elipsocini*, *Peripsocini*, and *Bertkauiini*); iii. *Epistantia* (with the tribes *Psoquillini*, *Troctini*, and *Atropini*).

——. Neue Psociden des königl. zoologischen Museums zu Berlin. S. E. Z. xliv. pp. 65–87. (Contained in Nos. 1–3 of the vol. for 1883, stated to have been published "Anfang November, 1882.")

MÜHLEN, MAX VON ZUR. Die Psociden Liv- Est- und Kurlands. SB. Ges. Dorp. vi. pp. 328–334.

A list of 25 species (one or two of which are given as doubtful), with remarks, chiefly of local interest.

Cæcilius, Curtis. An analytical table of the European species is given by Kolbe in Ent. Nachr. viii. pp. 210 & 211. 9 species are differentiated. *C. dalii*, McLach., is transferred to *Philotarsus*.

Peripsocus papillatus, Dale, is distinct from *albo-guttatus*, Dalm.; Kolbe, *l. c.* p. 211.

Psocus personatus, Hag., occurs in the Canaries, *Stenopsocus cruciatus*, L., in Madeira, *Cæcilius dalii*, McLach., in Madeira and the Canaries; McLachlan, J. L. S. xvi. pp. 174 & 175 (other species already recorded from the islands are indicated).

New genera:—

Neopsocus, Kolbe, Ent. Nachr. viii. p. 207. Allied to *Psocus* (restricted). Male with complete wings, female sub-apterous. Neuration in ♂ similar to

that of *Psocus*, but the pterostigma has a rudimentary spur-vein at its lower angle. Body (especially in ♀) clothed with incrassate hairs. Type, *N. rhenanus*, sp. n., *ibid.*, Rhenish Prussia (under a stone).

Bertkauia, id. *l. c.* p. 208. Apterous; no ocelli; prothorax distinct; antennæ 13-jointed; tarsi bi-articulate; maxillary palpi long and thin, with acuminate terminal joint. (Placed in the division *Psocina*.) Type, *B. prisca*, sp. n., Siebengebirge (under stones).

Pseudopsocus, id. *ibid.* Apterous; ocelli prominent; antennæ 13-jointed; tarsi tri-articulate; prothorax free. (Placed in the division *Psocina*.) Type, *P. rostocki*, sp. n., p. 209, Westphalia.

Cerobasis (*Atropina*) id. p. 212. Antennæ 18-jointed; tarsi tri-articulate; no wing-scales. Allied to *Hyperetes*; type, *C. muraria*, sp. n., *ibid.*, Westphalia.

Tichobia (*Atropina*) id. *ibid.* Antennæ 14-jointed; tarsi tri-articulate; no wing-scales; palpi not spurred. Type, *T. alternans*, sp. n., *ibid.*, Westphalia.

Cerastis, id. S. E. Z. xliv. p. 65. Allied to *Psocus* (restricted), but the first discoidal areole of the anterior wings twice or thrice larger than the second, &c. Includes *Psocus venosus*, Burm. (and var. n. *mexicana*, p. 75, Mexico), *fuscipennis*, Burm., *infectus*, McLach., and the following sp. nn.:—*crassicornis*, p. 70, Brazil, *colorata*, p. 71, Brazil, *ocularis*, p. 72, Brazil, *mœsta*, ibid., Colombia, *pallidinervis*, p. 73, Colombia, *bogotana*, ibid., Bogota, *vetusta*, p. 74, Colombia. A species is indicated in the table at p. 70, as "*nigrofasciata*, Hag." (with a var. *elegantula*, at p. 75, from Venezuela); this is probably *P. trifasciatus*, Provancher.

Syngonosoma, id. *l. c.* p. 76. Allied to *Eremopsocus*, but the antennæ 13-jointed, and only the third and fourth joints thickened, &c.; type, *S. flagellicorne*, sp. n., p. 78, Colombia.

Blaste, id. *l. c.* p. 79. Allied to *Amphigerontia*; differs in the form of the pterostigma, &c.; type, *B. juvenilis*, sp. n., p. 80, Pennsylvania.

Trocticus (*Atropina*), Bertkau, Arch. f. Nat. xlix. p. 99. No ocelli; wings rudimentary; antennæ thread like, 13 jointed; type, *T. gibbulus*, sp. n., *id. l. c.* pl. i. fig. 2, Rhenish Prussia (= the short-winged form of *Mesopsocus unipunctatus*, Müller; *cf.* Bertkau, Verh. Ver. Rheinl. xxxix. p. 128).

Lapithes, id. *l. c.* p. 100. Type, *L. pulicarius*, sp. n., *id. ibid.* pl. i. fig. 3 (= *Bertkauia prisca*, Kolbe, see *suprà*; cf. Bertkau, *l. c.* p. 128).

Kolbia, id. Verh. Ver. Rheinl. xxxix. p. 129. Allied to *Cœcilius*, differs in the pterostigma being elongate, and not dilated at the end, in the short tenth-joint of the antennæ, in the rudimentary wings of the ♀, &c. Type, *K. quisquiliarum*, sp. n., *ibid.*, Rhenish Prussia (under stones).

Archipsocus, Hagen, S. E. Z. xliii. p. 225. Allied to *Empheria*, but the imperfect neuration and long first-joint of the palpi separate it from all known genera; type, *A. puber*, sp. n., p. 222, pl. i. fig. 10 (fossil in amber).

Spharopsocus, id. *l. c.* p. 230. A remarkable genus with elytriform anterior wings; type, *S. kunowii*, sp. n., p. 226, pl. ii. fig. 1 (fossil in amber).

New species :—

Cœcilius corsicus, Kolbe, Ent. Nachr. viii. p. 209, Corsica ; *perlatus*, p. 210 (= *obsoletus*, id. var. *olim*); *piceus*, p. 210, Saxony ; *pilosus*, Hagen, S. E. Z. xliii. p. 283, pl. i. fig. 3 (in amber).

Peripsocus parvulus, Kolbe, *l. c.* p. 211 (= *alboguttatus*, id. var. *olim*).

Psocus japonicus, id. *l. c.* p. 209, Japan ; *fumigatus*, id. S. E. Z. xliv. p. 81, *pyralinus*, ibid., and *pictiventris*, p. 83, Brazil ; *heteromorphus*, Bertkau, Arch. f Nat. xlix. p. 98, pl. i. fig. 1, Rhenish Prussia (= *Neopsocus rhenanus*, Kolbe).

Atropos sericea, Kolbe, S. E. Z. xliv. p. 86, Silesia ; *succinica*, Hag., *l. c.* xliii. p. 289, pl. ii. fig. 3 (fossil in amber).

Empheria villosa, Hagen, *l. c.* p. 221, pl. i. fig. 9 (fossil in amber).

Perlidæ.

Perla ferreri, Pict., rediscovered in the Val Anzasca, the ♀ described ; McLachlan, Ent. M. M. xix. p. 109.

Ephemeridæ.

Eaton, A. E. An announcement of new genera of the *Ephemeridæ*. Ent. M. M. xviii. pp. 207 & 208. [Supplementary, *cf.* Zool. Rec. xviii. *Ins.* p. 263.]

Vayssière, Albert. Recherches sur l'organisation des Larves des Ephémériens (Thèse présentée à la facultée des sciences de Paris pour obtenir le grade de docteur en sciences naturelles). Ann. Sci. Nat. (6) xiii. pt. 1, pp. 1–137, pls. i.–x.

The most important memoir on the subject that has yet appeared, divided conveniently into six chapters, of which chap. i. is occupied by a critical bibliography ; ii. treats on the general morphology and organs of respiration, and is the most important of all ; iii. deals with the circulatory system ; iv. with the digestive ; v. with the nervous ; and vi. concerns parasites. In Chap. ii. the author recognizes five subdivisions :—(1) Those larvæ in which each external respiratory organ forms a plate furnished with a fringe of long tubes, or filaments, all round ; in this subdivision the genera *Leptophlebia*, *Potamanthus*, and *Polymitarcys* are considered. (2) The respiratory apparatus lamellate, without any trace of marginal filaments ; comprising *Oniscigaster*, *Centroptilum*, and *Cloeon*, with the addition of *Cloeopsis*, originally proposed by Eaton for *C. dipterum*, and afterwards abandoned, but which the author thinks should be maintained. (3) The apparatus consisting of a "protecting" lamina, at the base of which is a tuft of filaments, or a double bunch of very delicate filaments ; in this subdivision come such genera as *Heptagenia*, *Oligoneuria*, *Jolia*, and *Ephemerella*. (4) In *Cœnis* and *Tricorythus* the second pair of branchiæ form "protective" organs covering all the other pairs ; the first pair atrophied. (5) Here the apparatus is completely concealed and protected by the mesothoracic development ; comprising *Batisca* and *Prosopistoma*. All

these genera are treated upon more or less in detail; *Prosopistoma* in great detail. In Chap. vi. certain parasites are mentioned, all belonging to microscopic organisms, for the most part animal, but in the case of *Prosopistoma* of an external vegetable nature. The eleven plates, from the author's own drawings, are beautifully executed; the figures are all numbered consecutively from 1 to 120. Excluding details, the principal figures are as follows:—Pl. i. *Leptophlebia fusca* and *Ephemera vulgata*; ii. *Polymitarcys virgo* and *Oniscigaster wakefieldi*; iii. *Heptagenia longicauda*; iv. *Cloeon dipterum*; v. & vi. are occupied solely by details; vii. *Oligoneuria garumnica*; viii. *Ephemerella ignita* and *Tricorythus* sp.; ix.–xi. *Baetisca* and *Prosopistoma*, and on xi. are also represented the parasites before alluded to.

WALLENGREN, H. D. J. Förteckning på de Ephemeriden som hittels blifvit funna på Skandinaviska halfön. Ent. Tidskr. iii. pp. 173–178, 204 & 205.

A list of 22 species, with notes. The following synonymic notes are of importance:—*Ephemera vespertina*, Zett., = *Leptophlebia fusca*, Curt.; *E. brevicauda*, F., Zett., is a *Cænis*, and = *C. macrura*, Steph.; *E. horaria*, L., is also a *Cænis*, and = *dimidiata*, Steph. *E. vitreata*, Zett., is a distinct boreal species of *Baetis*.

WESSELY, T. Die Eintagsfliege. Bl. böhmisch. Vogel-schutz Ver. Prag, ii. pp. 55–57. (*Cf.* also Orn. Centralbl. 1882, pp. 54–56.)

Probably concerns *Polymitarcys virgo*. The masses of the insect are collected at swarming time at Prague, and sold as food for insectivorous birds. The author discountenances this practice, and is of opinion that such food causes diseased livers in birds fed with it.

A species of May-fly in Ceylon has the abdomen sufficiently luminous to enable the insect to be captured on a very dark night. It is probably *Teloganodes tristis*, Hag.: Waterhouse, Lewis, & Eaton, P. E. Soc. 1882, p. xiii.

Oniscigaster wakefieldi, McLach., received from Nelson, New Zealand; H. Lucas, Bull. Soc. Ent. Fr. (6) ii. p. xxxii.

Prosopistoma punctifrons, Latr. Lucas has captured the larvæ on several occasions in the neighbourhood of Paris. The insect should take the specific name "*foliaceum*," Fourcroy, which was bestowed upon it in 1785; *l. c.* p. xcvi.

Cloeon dipterum. An abstract of Ciaccio's memoir on the structure of the eyes of this species [*cf.* Zool. Rec. xviii. *Ins.* p. 263], is given by Cavanna in Bull. Ent. Ital. xiv. p. 154.

New genera:—

Hagenulus, Eaton, *l. c.* p. 207. Allied to *Adenophlebia*; type, *H. caligatus* (Hag., MS.), sp. n., *ibid.*, Cuba.

Teloganodes, id. *l. c.* p. 208. Allied to *Ephemerella*; type, *Cloe tristis*, Hag.

Leptohyphes, id. *ibid.* Allied to *Tricorythus*; type, *L. eximius*, sp. n., *ibid.*, Argentine Republic.

New species :—
Baetis sardoa, Costa, Atti Acc. Nap. ix. p. 34, Sardinia.
Cloe apicalis, id. *ibid.*, Sardinia.

Odonata.

Liniger, E. Die Odonaten der bernischen Mittellandes. MT. schw. ent. Ges vi. pp. 215–230.

Enumerates (with local information) 16 *Libellulina*, 4 *Corduliina*, 5 *Gomphina*, 9 *Æschnina*, 2 *Calopteryginа*, and 16 *Agrionina*, or 52 in all; but *Sympetrum vulgatum* appears to have been accidentally omitted (*l. c.* p 348), hence the number is 53.

Poletaiew, Nicolaus. Speicheldrüsen bei den Odonaten. Hor. Ent. Ross. xvi. pp. 3–5, pl. i.

The author has found the salivary glands to exist in *Libellulina*, *Æschnina*, and *Agrionina*; their development commences in the latter part of the aquatic life; they are double and compound, and lie in the prothoracic region. The figures given refer to *Lestes sponsa*, *Æschna grandis*, and *Libellula scotica*.

——. Du developpement des muscles d'ailes chez les Odonates. *L. c.* pp. 10–31, pls. iv.–viii.

It is impossible to give a brief summary of this paper; it should be studied in connection with the crowded anatomical figures on the five plates, which are more important than the text.

Santos, F. Mattozo. Contributions pour la faune du Portugal. Notes Entomologiques. i. (1) Pseudo-Névroptères Amphibiotiques, Fam. *Odonata*. J. Sc. Lisb. No. xxxiv. pp. 88–104.

Apparently the first of a series of lists on the Zoology of Portugal in general, and of the Estrella in particular. According to the author 37 species of *Odonata* have been noticed in Portugal, 7 of which are here recorded for the first time. The list comprises 7 *Libellulina*, 1 *Corduliina*, 6 *Æschnina*, 5 *Gomphina*, 3 *Calopteryginа*, and 15 *Agrionina*.

Selys-Longchamps, E. de. Sur la distribution des Insectes Odonates en Afrique. Congr. Sc. x. pp. 663–669.

A sketch of the African Fauna in connection with the geographical distribution of Insects in general and of the genera of *Odonata* in particular (an outline of the subject so far as concerns Algeria was given in Zool. Rec. xviii. *Ins.* p. 266). Of 40 groups cited 17 are exclusively proper to Africa or its islands, but no special genus of *Libellulina* is peculiar, the endemic fauna being especially rich in *Corduliina*, *Gomphina*, *Calopteryginа*, and *Agrionina*. The author objects to the term "European" as applied to insects that do not occur in Europe proper. Some new genera are indicated. The memoir concludes with an approximate enumeration of the number of species now known, according to the subfamilies. The total is given as 1676, composed of 461 *Libellulina* (84 African), 100 *Corduliina* (11 African), 225 *Gomphina* (19 African), 150

Æschnina (17 African), 205 *Calopterygina* (19 African), 535 *Agrionina* (55 African). The number of the actual European species is given as 103.

[Selys-Longchamps, E. de.] Odonates des Philippines. An. Soc. Esp. xi. pp. 5–34, pl. i.

Based principally on the materials collected by Semper. 77 species are enumerated (or described), of which 41 are peculiar to the Philippines, the others being found also in the neighbouring islands. Only one genus (*Hypocnemis*) is peculiar.

A list of five species (of no importance) collected by Cavanna in southern Italy is given by Targioni-Tozzetti & Stefanelli in Bull. Ent. Ital. xiv. p. 54.

F. Sordelli notices in some detail two fossil species found at Montescano near Stradella, Lombardy; he inclines to refer them to *Libellula carynome* and *L. doris*, Heer; Bull. Ent. Ital. xiv. pp. 226–228.

Silvanus Wilkins, Midl. Nat. v. pp. 228–234, has a popular article "On a Dragon-Fly," in which, among other extraordinary statements, we find the British species of *Odonata* estimated at about 200. [There are only about 100 in all Europe.—Rec.]

Libellulina.

Elmer's note on the migration of *Libellula scotica* (cf. Zool. Rec. xviii. *Ins.* p. 265), reproduced in S. E. Z. xliii. p. 260; an extended abstract in JH. Ver. Württ. xxxviii. pp. 105–113.

Libellula quadrimaculata, L. Every year a prodigious migration of this species takes place in the Charente Inférieure at the end of September, from north to south. They are always paired, the mandibles of one sex holding the extremity of the abdomen of the other [!]; C. Riveau, Feuill. Nat. xii. p. 123. An immense swarm appeared in Holland, at Zierikzee, May 30th, from 11 in the morning till 11 at night, they came from the south-west; Fokker, Tijdschr. Ent. xx. Verslag, p. xvi.

Libellula chrysostigma, Burm. McLachlan (J. L. S. xvi. pp. 177–179) gives the results of a detailed investigation regarding this Canarian insect; it is not identical with *trinacria*, Selys, as was supposed, but = *barbara*, Selys (= also *olympia*, Brullé), and hence is an *Orthetrum* (= *Libella*, Brauer). *L. trinacria* not a true *Lepthemis*, but is more allied to *Orthetrum*.

Libellula rubella, Brullé, = *L. arteriosa*, Burm., and hence is a *Trithemis*; McLachlan, *l. c.* p. 179.

Rhyothemis phyllis, Sulz., race n., *subphyllis*; Selys, An. Soc. Esp. xi. p. 9, Philippines.

Diplacina bolivari, Selys, An. Soc. Esp. xi. p. 14, and *braueri*, id. *l. c.* p. 15, Philippines, spp. nn.

Corduliina.

Selys-Longchamps, E. de. Note sur le genre *Gomphomacromia*, Brauer. CR. Ent. Belg. xxvi. pp. clxvi.–clxix.

Under this title is given a partial re-arrangement of the Légion *Cor-*

duliina, with analytical tables, in which the Légion is made to include the "genera" *Cordulia*, *Gomphomacromia*, *Cordulephya*, and *Nesophya*, the two former with numerous "sub-genera"; a special table deals with *Gomphomacromia* which, on neural characters, includes *Oxygastra*, *Gomphomacromia* (as subgenus), and three new subgenera.

Syncordulia, subg. n. of *Gomphomacromia*, Selys, *l. c.* p. clxviii. Sectors of the arculus separated at their origin; one row of post-trigonal cellules; the tenth segment in the ♂ not prolonged, and the inferior appendage triangular. Type, *Epophthalmia gracilis*, Burm.

Neocordulia, subg. n. of *Gomphomacromia*, id. *ibid.* Differs from *Gomphomacromia* (as subg.) in having two rows of post-trigonal cellules, the inferior appendage of the ♂ long-oval, emarginate at the apex, &c. Includes *G. androgynis*, *setifera*, *volxemi*, and *batesi*, Selys.

Nesocordulia, subg. n., McLachlan, *l. c.* p. clxx. (included in Selys's tabular synopsis of *Gomphomacromia*. Sectors of the arculus united at their origin; two rows of post-trigonal cellules; tenth segment prolonged into a conical point; inferior appendage triangular. *N. flavicauda*, sp. n., *ibid.*, Madagascar.

Æschnina.

STEFANELLI, P. Osservazioni sui costumi e sullo sviluppo del l'*Æschna cyanea*, Müll. Bull. Ent. Ital. xiv. pp. 236–238; *cf.* Nature, xxvi. p. 89.

The nymphs come out of the water at night and attack and devour the newly-emerged imagos of the same species.

Anax ephippiger in great numbers on the West Coast of Africa far from fresh water; G. F. Mathew, Ent. M. M. xviii. p. 258.

C. Marchal, Feuill. Nat. xii. p. 111, narrates the proceedings of an *Æschna grandis*, which struck the sand with its abdomen very rapidly at one centimetre from the edge of the water; he thinks it was covering eggs already laid, and not laying them.

Anax mauricianus, Ramb. A male of what is believed to be this insect is recorded from Madeira, with notes on the close affinity to, and slight differences between, it and *A. formosus*; McLachlan, J. L. S. xvi. p. 182.

A. H. Mundt records an enormous migration of *Æschna heros*, F., in Illinois on Aug. 13th, 1881, the course was south-westerly; Canad. Ent. xiv. pp. 56 & 57.

Heliæschna, g. n., De Selys, Congr. Sc. x. p. 667. Differs from *Gynacantha* by the basal area being reticulated (no type stated). Cameroons.

Gynacantha hyalina, p. 19, *basiguttata*, p. 20, Selys, An. Soc. Esp. xi. Philippines, spp. nn.

Gomphina.

Hagenius brevistylus, Selys. Remarks on the nymph-skins of this species are given by McLachlan in P. E. Soc. 1882, p. xx.

Hagen, Nature, xxvii. p. 173, alludes to certain tracks on the sand towards a willow tree a hundred feet from the river, made by the nymphs

of a new species of *Ophiogomphus* in search for a convenient place for transformation, the tracks being in a straight line from the water to the tree. He suggests that certain imprints in fossil slabs may have been due to an analogous cause.

Calopterygina.

Rhinocypha albistigma, Selys, was probably founded on adult examples of *R. semitincta* in which the white pterostigma of immature specimens is retained ; Selys, An. Soc. Esp. xi. p. 22.

Euthore mirabilis, McLach., ♂ & ♀ figured in C. O. Waterhouse's Aid to Identification, i. pls. lxv. & lxvi.

Agrionina.

Sympycna pædisca. Brauer, Verh. z.-b. Wien, xxxii. pp. 75 & 76, maintains that the species so described by him [*cf.* Zool. Rec. xvii. *Ins.* p. 215] is distinct from *S. fusca*, and proposes to retain the specific name in spite of its prior use by Eversmann.

Hypocnemis, Hagen. A tabular view of the eight species now known is given by De Selys in An. Soc. Esp. xi. pp. 24–26.

New genera and species :—

Neurolestes, g. n., Selys, Congr. Sc. x. p. 668. Differs from *Chlorolestes* (and from other *Agrionina*) in having three antecubital nervules; (no type given) Cameroons.

Hemicnemis, g. n., *id. ibid.* Founded on *Trichocnemis cyanops* and *bilineata*, Selys, which differ from the other species in the form of the quadrilateral (Seychelles).

Amphilestes philipna, sp. n., *id.* An. Soc. Esp. xi. p. 26, Philippines.

Hypocnemis hæmatopus, p. 27, pl. i. figs. 1–10, and *flammea*, p. 28, *id. l. c.*, Philippines : spp. nn.

Alloneura integra, p. 32, and *obsoleta*, p. 33, *id. l. c.*, Philippines : spp. nn.

ORTHOPTERA.

BY

ROBERT MCLACHLAN, F.R.S., F.L.S., &c.

THE GENERAL SUBJECT.

BERLESE, ANTONIO. Ricerche sugli organi genitali degli Ortotteri (*Mantidæ, Locustinæ, Gryllidæ, Gryllotalpidæ, Truxalidæ, Acrydiidæ*). Atti Acc. Rom. (3) xi. pp. 259–298, pls. i. & ii.

A very elaborate article, divided into two parts, viz., (1) "Anatomia descrittiva e comparata," (2) "Morfologia." A number of mostly common species are selected by the author as types of the generative system, both internal and external, for both sexes of each of the larger divisions. For the most part, the paper is purely anatomical and physiological; the two plates are full of beautifully executed details for both sexes.

BOLIVAR, IGNACIO. Descriptions d'Orthoptères et observations synonymiques diverses. Ann. Soc. Ent. Fr. (6) ii. pp. 459–464.

Principally concerns species from New Caledonia.

——. Études sur les Insectes d'Angola qui se trouvent au Muséum National de Lisbonne. Orthoptères. J. Sci. Lisb. No. xxx. pp. 107–119.

Notes on 48 species of various families, some new.

BORMANS, A. DE. Faune Orthoptérologique des iles Hawaï ou Sandwich. Ann. Mus. Genov. xviii. pp. 338–348.

Enumerates 5 species of *Forficulidæ* (1 new), 8 of *Blattidæ*, 2 of *Locustidæ* (1 new), and 2 of *Gryllidæ*. The Orthopterous Fauna is Australian or Malayan, as opposed to American.

BRUNNER VON WATTENWYL, C. Prodromus der europäischen Orthopteren. Leipzig: 1882, 8vo, pp. i.–xxxii. & 1–466, pls. i.–xi., and map.

By far the most important work on the subject since Fischer's "Orthoptera Europæa" (1853). In his introductory remarks the author states that the number of species has doubled since the publication of Fischer's work. He explains the limits of the European fauna as defined by him, which are elucidated in the map, indicating the sub-regions by different colours; this is followed by a chapter on the capture and preparation of *Orthoptera*: then comes a full bibliography, and, finally, a systematic list of genera and species. The monographic portion de-

scribes 463 species (including a few new), distributed as follows according to families, viz.:—*Forficularia*, 26 species, *Blattodea*, 23, *Mantodea*, 13, *Phasmodea*, 4, *Acridiodea*, 150, *Locustodea*, 214, *Gryllodea*, 33. The alphabetical list is full and complete. The eleven plates contain 108 principal figures, with innumerable subsidiary details. Many of the additional species were captured in Servia by Von Schulters-Rechberg, and the latter alludes to them in an account of his excursion published in MT. schw. ent. Ges. vi. pp. 382–385.

CATANI, TOMMASO. La Classificazione degli Ortotteri. Cenno storico. Bull. Ent. Ital. xiv. pp. 302–311.

An historical sketch of the many systems suggested; the author adopts Erichson's ideas in the main, with the later improvements of Gerstäcker in nomenclature.

COLENSO, W. On some new and undescribed species of New Zealand Insects of the Orders *Orthoptera* and *Coleoptera*. Tr. N. Z. Inst. xiv. pp. 277–281.

The two cave-frequenting species of *Hemidina* are of special interest.

HUTTON, F. W. Catalogues of the New Zealand *Diptera*, *Orthoptera*, and *Hymenoptera*, with descriptions of the species. Wellington, N. Z.: 1881. [*Cf.* Zool. Rec. xviii. *Ins.* p. 6.]

A classified reprint of previous descriptions, without critical remarks. The *Orthoptera* occupy pp. 71–74. The number of species is given as 38.

TARGIONI-TOZZETTI, A., & STEFANELLI, P. Catalogo degli animali [*Orthoptera*] raccolti al Vulture, al Pollino ed in altri luoghi dell' Italia meridionale e centrale. Bull. Ent. Ital. xiv. pp. 50–54.

Forficulidæ, 5 species, *Blattidæ*, 3, *Mantidæ*, 1, *Acridiidæ*, 10, *Locustidæ*, 23, *Grylidæ*, 3. Collected by G. Cavanna; a name-list only.

——. Armature genitali mascheli degli Ortotteri saltatori. Bull. Ent. Ital. xiv. pp. 384 & 385.

A brief comparison of the parts in *Locustidæ* and *Acridiidæ*, according to the views of Lacaze-Duthiers, Brunner von Wattenwyl, &c.

Notes on species occurring in Livonia and Esthonia are given by Bruttan in SB. Ges. Dorp. vi. pp. 431 & 432.

A local list of species by A. M. Lomnicki appears in Sprawozd. Kom. fizogr. xvi. pp. 243 & 244.

A list of 27 species captured at Cauterets, Hautes Pyrenées, in July, is given by Finot, Bull. Soc. Ent. Fr. (6) ii. pp. xiv. & xv.

Observations on the recent invasions of various injurious species in Italy, and on the parasites tending to destroy them, appear in Bull. Ent. Ital. xiv. pp. 402 & 403.

A list of nearly 50 species taken in the Island of Sardinia in September, 1881, is given by Achille Costa in Atti Acc. Nap. ix. pp. 21 & 22.

Targioni-Tozzetti & Cavanna give a list of 25 species of all families collected at Lavaiano, in the Province of Pisa; Bull. Ent. Ital. xiv. pp. 367–369.

Carlos Berg gives a list of 15 species collected in the Rio Negro district of Patagonia. Roca's Espedic. al Rio Negro, pt. i. Zoologia, pp. 77–80.

Forficulidæ.

Forficula targionii, Brunner, Prodr., p. 14, Calabria, *ætolica*, p. 18, Asia Minor; *F. hawaiensis*, Bormans, Ann. Mus. Genov. xviii. p. 34 (woodcuts), Hawaiian Islands : spp. nn.

Blattidæ.

Butler, A. G. On some new genera and species of *Blattariæ* in the Collection of the British Museum. Ann. N. H. (5) ix. pp. 383-388.

Cholodkowsky, N. Zur Frage über den Bau und über die Innervation der Speicheldrüsen der Blattiden. Hor. Ent. Ross. xvi. pp. 6–9, pls. i.–iii.

Deichmüller, J. V. Ueber einige Blattiden aus der Brandschiefern der unteren Dyas von Weissig bei Pillnitz. Abh. Ges. Isis, 1882, pp. 33–44, pl. i.

Homœogamia sinensis, Sauss., pertains to the genus *Polyphaga*; Bolivar, Ann. Soc. Ent. Fr. (6) ii. p. 463.

New genera :—

Æluropoda, Butler, *l. c.* p. 385. Allied to *Gromphadorhina*; type, *Æ. gigantea*, sp. n., p. 386 (woodcut, p. 384), Madagascar.

Dicellonotus, id. *l. c.* p. 387. Allied to *Panesthia*; types, *D. lucanoides*, p. 387 (fig. p. 384), and *morsus*, p. 388, South India, spp. nn.

New species :—

Gromphadorhina brunneri, Butler, *l. c.* p. 384, Madagascar.

Polyzosteria [*Polyrosteria* in error] *sedilloti* (p. 459) and *variolosa* (p. 460), Bolivar, Ann. Soc. Ent. Fr. (6) ii., New Caledonia.

Polyphaga plancii, id. *l. c.* p. 462, Peking.

Ectatoderus noumeensis, id. *l. c.* p. 460, New Caledonia.

Deropeltis paulinii, id. J. Sci. Lisb. No. xxx. p. 108, Benguela.

Ischnoptera bocagii, id. *l. c.* p. 107, Angola.

Aphlebia pallida, Brunner, Prodr. p. 42, Greece and Asia Minor, *græca*, p. 43, Greece and Asia Minor, spp. nn.

Oryctoblattina oblonga, Deichmüller, *l. c.* p. 41, pl. i. fig. 4, fossil at Weissig.

Etoblattina flabellata, Germ., var. n. *stelzneri*, id. *l. c.* p. 34, pl. i. fig. 1, fossil at Weissig; *E.* (?) *carbonaria*, Germ., var. (not named), *id. l. c.* p. 31, pl. i. figs. 2 & 3, fossil at Weissig.

Mantidæ.

Wood-Mason, J. On new and little known *Mantodea*. J. A. S. B. li. pt. 2, pp. 21–36.

In addition to the descriptions of new species and varieties, there are various notes on known species :—*Amorphoscelis annulicornis*, Stål, redescribed, p. 21. *Eremophila arabica*, Sauss., ♂ described, p. 22. *Pyrgocotis*

gracilipes, Stål, = *Didymocorypha ensifera*, W.-M., the latter having priority, p. 24. *Episcopus chalybeus*, Burm., ♀ described, p. 24. *Dysaules longicollis*, Stål, redescribed, p. 25., with var. n. *brevipennis*, Bangalore. *Euchomena thoracica*, De Haan:—*Mantis heteroptera*, De H., has been considered a synonym, but the ♀ from Celebes is a distinct species, and the name *heteroptera* should be reserved for it only, p. 27. *Hierodula quinquedens*, McLeay, belongs to the section *Sphodropoda*, Stål, p. 28. *H. bicarinata*, Sauss., stridulates louder than the hissing of a snake, and the fact is well known in South Africa, p. 29. *H.* (*Rhombodera*) *atricoxis*, W.-M., var. n. *grandis*, p. 31, Torres Straits. *Mesopteryx platycephala*, Stål, ♀ described, p. 34. There are also local notes on other species.

Mantis religiosa. E. Lelièvre states that, having captured a pair of this insect *in copulâ*, and placed them in a closed box, he was surprised to find, several days after, that the female had devoured the male; Feuill. Nat. xii. p. 45.

New species:—

Chæradodis brunneri, Wood-Mason, *l. c.* p. 21, Bogota.

Trachodes insidiator, id. *l. c.* p. 22, Nyassa, *dissimulator*, p. 23, Cameroons.

Conypeta authæmon, id. *l. c.* p. 26, Mergui.

Hierodula (*Sphodromantis*) *arabica*, id. *l. c.* p. 29 (= *trimacula*, W.-M., *nec* Sauss.), Arabia; *H.* (*S.*) *muta*, p. 30, Cameroons; *H.* (*H.*) *sternosticta*, p. 31, Australia.

Mantis callifera, id. *l. c.* p. 32, Cape of Good Hope; *M. novæ-zelandiæ*, Colenso, Tr. N. Z. Inst. xiv. p. 277, New Zealand.

Iris orientalis, Wood-Mason, *l. c.* p. 32, Kangra.

Polyspilota insignis, id. *l. c.* p. 33, Cameroons.

Mesopteryx robusta, id. *l. c.* p. 36, Andamans or Assam.

Callimantis eximia, Pascoe, Ann. N. H. (5) ix. p. 423, Para.

Ameles heldreichi, Brunner, Prodr. p. 67, fig. 18, Greece and Asia Minor.

PHASMATIDÆ.

MACLEAY, WILLIAM. On a species of *Phasmatidæ* destructive to *Eucalypti*. P. Linn. Soc. N. S. W. vi. pp. 536-539.

Concerns a new species which is said to denude the trees completely of their leaves.

THOMSON, ARTHUR. Notes on a species of Stick Insect reared in the Insect House in the Society's Gardens. P. Z. S. 1882, pp. 718 & 719, pl. lii.

Concerns *Bacillus patellifer*, Bates, reared from eggs sent from Cachar; these were received in October, and hatched in March following; the young fed upon grass and also upon leaves of orange; the ♀ is figured.

Phasma fayoli, g. & sp. nn., Brongniart, Bull. Soc. Ent. Fr. (6) xvi. (fossil in the Carboniferous of Commentry, France).

B. sylvaticus, Colenso, Tr. N. Z. Inst. xiv. p. 278, Hawkes Bay, ; *B. atticus*, Brunner, Prodr. p. 75, Athens: spp. nn.

Podocanthus wilkinsoni, sp. n., Macleay, *l. c.* p. 538, Westmoreland, New South Wales.

Heteropteryx rollandi, sp. n., Lucas, Bull. Soc. Ent. Fr. (6) ii. p. xxxii, Malacca.

Gryllidæ.

Homœogryllus japonicus, De Haan. Female described; Bolivar, Ann. Soc. Ent. Fr. (6) ii. p. 464.

Gryllus frontalis, Fieb., redescribed, with figures; N. Arnold, Hor. Ent. Ross. xvi. pp. 38–42, pl. ix.

Gryllodes ibericus, sp. n., Brunner, Prodr. p. 438, fig. 100, Spain.

Platyblemmus finoti, sp. n., *id. l. c.* p. 442, Algeria.

Gryllomorphus alienus, sp. n., *id. l. c.* p. 444, Spain.

Locustidæ.

Conocephalus ensiger, Harris (?), found alive in a hot-house near London; J. J. Weir, P. E. Soc. 1882, p. xxi.

New genera and species:—

Talitropsis, Bolivar, Ann. Soc. Ent. Fr. (6) ii. p. 461. Between *Troglophilus* and *Ceuthophilus*; type, *T. sedilotti*, sp. n., p. 462, New Zealand.

Analota, Brunner, Prodr. p. 316. Allied to *Paradrymadura*; includes *Pterolepis alpina*, Yersin, and "*Omalota*" *appenninigena*, Targioni.

Antaxius, id. *l. c.* p. 324. Allied to *Platycleis*; includes *Pterolepis spinibrachius*, Fisch., *pedestris*, F., *kraussi*, Boliv., *brunneri*, Krauss, and *difformis*, Brun.

Anterastes, id. *l. c.* p. 328. Allied to *Pterolepis*; includes *P. raymondi*, Yersin, and *A. serbicus*, sp. n., p. 329, fig. 84, Servia.

Callimenus pancici, Brunner, Prodr. p. 252, fig. 58, Servia, *inflatus*, p. 253, Amasia.

Orphania scutata, id. *l. c.* p. 256, Balkans.

Isophya modestior, id. *l. c.* p. 276, Servia, *obtusa*, p. 279, Servia, *fusconotata*, p. 281, Servia.

Drymadusa brevipennis, id. *l. c.* p. 315, Astrabad, *grisea*, ibid., Syra.

Paradrymadusa longipes, id. *l. c.* p. 316, South Russia.

Rhacocleis bormansi, id. *l. c.* p. 322, Italy.

Pachytrachelus frater, id. *l. c.* p. 331, Dalmatia.

Thamnotrizon brevicollis, Costa, Atti Acc. Nap. ix. p. 33, Sardinia, *smyrnensis*, Brunner, Prodr. p. 336, Greece, Turkey, Asia Minor, *annulipes*, ibid., Asia Minor, *prasinus*, p. 337, Smyrna, *castaneo-viridis*, ibid., Brussa, *bucephalus*, p. 338, Asia Minor.

Platycleis laticauda, Brunner, *l. c.* p. 349, Sicily and Algeria, *incer*[illegible] p. 352, Prussia?, *fusca*, p. 358, Greece, *domogledi*, p. 360, Hun[illegible] Servia, &c., *oblongicollis*, ibid., Servia, *amplipennis*, p. 361, Servia[illegible]

Ephippigera finoti, id. *l. c.* p. 376, Algeria, *gracilis*, p. 37[illegible] *algerica*, p. 382, Algeria, *antennata*, p. 383, Algeria, *luca*[illegible] Algeria, *transfuga*, p. 389, Algeria, *bormansi*, p. 393, Italy.

Pycnogaster bolivari, id. *l. c.* p. 404, fig. 92, Spain.

Dolichopoda bormansi, id. *l. c.* p. 414, Corsica.

Conocephalus blackburni, Bormans, Ann. Mus. Genov. xviii. p. 346 (woodcuts), Hawaiian Islands.

Hemidina gigantea, p. 278, and *speluncæ*, p. 280, Colenso, Tr. N. Z. Inst. xiv., New Zealand (in caves).

Pterolepis pedata, Costa, Atti Acc. Nap. ix. p. 33, Sardinia.

Enyalius obuncus, Bolivar, J. Sci. Lisb. No. xxx. p. 119, Angola.

ACRIDIIDÆ.

DEWITZ, H. Legescheide der Acridier. B. E. Z. xxvi. pp. 51–57, with diagrams.

STOLL, OTTO. Ueber die Wanderheuschrecke von Central-Amerika, *Schistocerca* (*Acridium*) *peregrina*, Oliv. MT. schw. ent. Ges. vi. pp. 199–211.

A very interesting historical and biological paper. The insect is known in Guatemala as "El Chapulin." It seems that the subject was first brought forward in the beginning of the seventeenth century by Thomas [illegible]ge, an English Catholic priest, who resided in the country. Full accounts of habits, &c., are given. Raptorial birds are the greatest enemies of the "Locust," especially a species of *Buteo*. They are also greatly infested by a parasitic *Mermis*, which was present in six out of ten examples dissected by the author. A dissertation on political economy, based partly on the damage caused by the insect, concludes the memoir.

Pachytylus migratorius in Esthonia; Bruttan, SB. Ges. Dorp. vi. pp. 412 & 413.

Proscopia. 5 distinct species of this genus occur near Porto Alegre, South Brazil, some of which are described in Burmeister's recent memoir. Notes given on their mimicry, &c.; W. Breitenbach, Ent. Nachr. viii. pp. 160 & 161.

Article "Locust," McLachlan, Encyc. Brit. (9th ed.) xiv. pp. 765–767; *Pachytylus migratorius*, *Acridium peregrinum*, and *Caloptenus italicus* and *spretus* are figured.

New genera :—

Humbe, Bolivar, J. Sci. Lisb. No. xxx. p. 117. Allied to *Œdipoda*; type, *H. pachytyloides*, sp. n., *ibid.*, Angola.

Camoensia, id. *l. c.* p. 111. Allied to *Petasia*; type, *C. insignis*, sp. n., *ibid.*, Angola.

Cyathosternum, id. *l. c.* p. 115. Allied to *Euprepocnemis*; type, *C. pre[illegible]ensile*, sp. n., *ibid.*, Angola.

Exochoderes, id. *l. c.* p. 113. Allied to *Teratodes*? ; type, *E. aurantia[illegible]*. 114, Angola.

[illegible]rodes, Brunner, Prodr. p. 191. Allied to *Nocarodes*; includes the [illegible] species formerly placed in *Nocarodes*, viz. :—*brunneri*, Boliv., [illegible]ol., *canonicus*, Fisch., *micropterus*, Bris., *nigro-punctatus*, Lucas, [illegible]liv., and *longicornis*, Boliv.

New species :—
Ochrophlebia subcylindria, Bolivar, *l. c.* p. 109, Angola.
Petasia anchietæ, id. *l. c.* p. 110, Angola.
Phymateus iris, id. *ibid.*, Ambriz.
Pyrgomorpha breviceps, id. *l. c.* p. 109, Angola.
Acridium asperatum, id. *l. c.* p. 112, *magnificum*, p. 113, Angola.
Caloptenus nigro-punctatus, id. *l. c.* p. 114, Angola.
Oxyrrhepes elegans, id. *l. c.* p. 116, Ambriz.
Ochrilidia pruinosa, Brunner, Prodr. p. 92, Rhodes.
Gomphocerus pallidus, id. *l. c.* p. 134, Sarepta.
Sphingonotus imitans, id. *l. c.* p. 153, Granada.
Glyphanus heldreichi, id. *l. c.* p. 183, Greece.
Nocarodes fieberi and *opacus*, id. *l. c.* p. 189, Asia Minor and Khiva.
Pamphagus verrucosus and *zebratus*, id. *l. c.* p. 199, Syria, *gracilis*, p. 200, Cyprus, *yersini*, ibid., Crete and Beyrut, *algericus*, p. 204, Algeria, *expansus*, p. 206, Gibraltar and Algeria.

RHYNCHOTA.

BY

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

THE GENERAL SUBJECT.

MOLEYRE, L. Recherches sur les organes du vol chez les insectes de l'ordre des Hémiptères. C. R. xcv. pp. 349–352.

On account of the peculiar structure of the wings in this Order, the folds connecting the hemelytra and the wings (sometimes reduced to a denticulated flap, or to a mere ridge), are of unusual importance. Their structure in the various families is correctly described.

REUTER, O. M. Verzeichniss palæarctischer Hemipteren, beschrieben von December, 1875, bis Januar, 1879. Ent. Nachr. viii. pp. 105–116.

Notes on the nervous system of the *Hemiptera* (in Russian); Brand
Troudy Ent. Ross. xii. pp. vi.–viii.

Notes on the *Hemiptera* contained in Wesmael's collection ; Leth
CR. Ent. Belg. xxvi. pp. cxxxvii.–cxxxix.

Additions to Perthshire *Hemiptera* ; Norman, Ent. M. M. xv

Contributions to a list of the *Hemiptera* and *Homoptera* of

and Cheshire (the north of Lancashire excepted); B. Cooke, Naturalist, vii. pp. 144 & 145, viii. pp. 33 & 34, 71–73.

Captures of *Hemiptera* at Deal, Hurst Green, Sussex, and at Chobham; E. Saunders & E. A. Butler, Ent. M. M. xix. pp. 87, 88, 115, & 140.

Localities for various French *Hemiptera*; Puton, Rev. d'Ent. i. p. 239.

List of *Hemiptera* collected by Krüper in Greece; Chicote, Ann. Ent. Belg. xxvi. pp. 87–90.

HEMIPTERA-HETEROPTERA.

Reuter, O. M. Finlands och den Scandinaviska Halföns Hemiptera-Heteroptera. Ent. Tidskr. iii. pp. 65–81, 105–121, 163.

Extends from *Peritrechus* to *Gerris*; no new species described.

Catalogue of the *Hemiptera-Heteroptera* of the Caucasian district with descriptions of new species (chiefly from Derbent); Jakovleff, Troudy Ent. Ross. xii. pp. 3–176, xiii. pp. 85–140.

Notes on various *Hemiptera-Heteroptera* new to Sweden; Reuter, Ent. Tidskr. iii. pp. 63 & 64.

Cimex and *Acanthia*. Use of these generic names discussed; *id.* Wien. E. Z. i. pp. 301–306.

Pentatomidæ.

Signoret, V. Groupe des Cydnides. 5e–8e parties. Ann. Soc. Ent. Fr. (6) ii. pp. 23–42, 145–168, 241–266, 465–484, pls. i., ii., vi.–ix., xiii. & xiv.

Extends from *Æthus*, Dall., to *Halmia*, Ellenr.

Pangæus uhleri, var. *xanthopus*, from Brazil, described; Signoret, *l. c.* p. 254.

Odontoscelis. Table of Russian species; Jakovleff, Bull. Mosc. lvi., 4, p. 347.

Belodera troberti, Muls., variation noticed; Rey, Ann. Soc. L. Lyon (2) xxviii. pp. 128 & 129.

Psacasta conspersa, Kunze, noticed as French; *id. l. c.* p. 129.

Podops annulicornis, Jak., redescribed; Horváth, Term. füzetek, v. p. 218.

Eusarco[co]ris perlatus, var. *ventralis* from Hungary described, *id. l. c.* p. 219.

Eurydema decoratum, Herr.-Schäff., var. *mehadiense* from Mehadia described; *id. l. c.*

New genera and species :—

Ceratocephala, Jakovleff, Troudy Ent. Ross. xii. p. 9. Allied to *Psacasta*; type, *C. caucasica*, sp. n., *l. c.* p. 10, from the Caucasus.

Micro[r]rhynchus, Signoret, Bull. Soc. Ent. Fr. (6) ii. p. lxiii. Allied to *Machymenus*; second joint of antennæ rudimentary, scarcely visible. Type, *M. beccarii*, sp. n., *ibid.*, Ké Island.

Trochiscus, Jakovleff, *l. c.* p. 46. Placed after *Strachia*; type, *T. hemipterus*, sp. n., *l. c.* p. 47 Caucasus.

Carenoplistus, id. Bull. Mosc. lvi., 4, p. 349. Allied to *Mustha*, but with 4-jointed antennæ; type, *C. faceni*, sp. n., *l. c.* p. 351, Transcaucasia.

Neosalica, Distant, Ent. M. M. xix. p. 157. Allied to *Piezosternum*, but with the sternal keel not produced beyond the intermediate coxæ; type, *N. forbesi*, sp. n., *l. c.*, Sumatra.

Stiraspis sardoa, Costa, Atti Acc. Nap. ix., 11, p. 38, Sardinia.

Trigonosoma umbrosum, Jakovleff, Troudy Ent. Ross. xiii. p. 145, Caucasus.

Phimodera protracta, id. *l. c.* p. 7, Caucasus.

Odontoscelis comaroffi, id. *l. c.* p. 14; *O. minuta*, id. Bull. Mosc. lvi., 4, p. 345: both from Derbent.

Sciocoris capitatus, id. *l. c.* p. 347, Shahrud.

Corimelæna comaroffi, id. Troudy Ent. Ross. xii. p. 21, Derbent.

Æthus similis, fig. 66, Cape, p. 24, *horridus*, Senegal, Sierra Leone, p. 26, *proximus*, Chinchoxo, p. 27, *vollenhoveni*, fig. 70, Sumatra, Java, p. 29, *convexus*, fig. 72, pl. i., Madagascar, p. 31, *borrii*, fig. 73, Silhet, p. 32, *parvulus*, fig. 74, Australia, p. 33, *politus*, fig. 77, California, Nicaragua, p. 36, *distinctus*, fig. 79, Monte Video, p. 37, *ferrugineus*, fig. 82, pl. ii., Mexico, p. 40, Signoret, Ann. Soc. Ent. Fr. (6) ii.

Cydnus thoreyi (? = *ovatulus*, Dall.), Rockhampton, pl. vi. fig. 90, p. 152, *pauculus*, fig. 96, Africa, p. 160, and *laticeps*, fig. 98, pl. vii., Hong-Kong, p. 162, *id. l. c.*

Pangæus levigatus, Ocana, pl. viii. fig. 110, p. 250, *vicinus*, Guayaquil, p. 255, *stæli*, Brazil, p. 256, *douglasi*, fig. 115, Australia, p. 258, *spangbergi*, fig. 116, Texas, *scotti*, fig. 117, New Zealand, p. 259, *buchanani*, fig. 118, Amazons, p 260, *sallæi*, fig. 119, Laguayra, Mexico, p. 262, *dallasi* (? = *docilis*, Walk.), fig. 121, Brazil, Guiana, p. 263, *petersi*, fig. 122, Peru, p. 264, and *minimus*, fig. 123, pl. ix., Mexico, p. 265, *id. l. c.*

Macroscytus reflexus, fig. 124, S. Africa, p. 466, *pfeifferi*, fig. 126, Borneo, p. 468, *acutus*, fig. 127, Africa, p. 469, *lobatus*, fig. 128, Bourbon, p. 470, *ruficornis*, fig. 129, Guinea, *excavatus*, fig. 130, Lake Nyassa, Africa, p. 471, *punctiventris*, fig. 132, pl. xiii., Zanzibar, p. 473, *nitidus*, fig. 133, Sherborough Island, p. 474, *niponensis* (Vollenh., MS.), fig. 134, Japan, p. 475, *expansus*, fig. 138, Bombay, p. 479, and *spinicrus*, fig. 139, pl. xiv., Cape St. Vincent, p. 480, *id. l. c.*

Geotomus latiusculus, Horváth, Term. füzetek, v. p. 217, Lenkoran.

Sehirus congener, Jakovleff, *l. c.* p. 25, Derbent.

Brachynema signata, id. *l. c.* p. 37, Derbent, &c.

Barbiger montanus, id. *l. c.* p. 40, Caucasus.

Strachia distincta, id. *l. c.* p. 44, Caucasus; *S. colorata*, id. Bull. Mosc. lvi., 4, p. 352, Shahrud.

Eusarco[co]ris kolenatii, Reuter (= *binotatus*, Kolen., *nec* Hahn), Wien. ent. Z. i. p. 113, Caucasus.

Tropi[do]coris japonicus, Distant, Ent. M. M. xix. p. 76, Tokei.

Odontotarsus oculatus, Amasia, Syria, and *irroratus*, Brussa, Horváth, *l. c.* pp. 217 & 218. (The former is redescribed as *O. freyi*, Puton, Rev. d'Ent. i. p. 22; *cf.* also p. 240.)

Eurydema spectabilis[-le], Horváth, *l. c.* v. p. 219, pl. v. figs. 3 & 4, Syria.

Memmia cowani, Distant, Ent. M. M. xix. p. 108, Madagascar.

Canthecona cognata, id. *l. c.* p. 157, Sumatra.

Coreidæ.

Distant (Biol. Centr. Am. *Rhynch. Het.*) notices and figures:—*Anfeius impressicollis*, Stål, pl. xv. fig. 20, *Corizus hyalinus*, fig. 7, p. 169, *punctatus*, Sign., fig. 8, *lateralis*, Say, figs. 9 & 10, pl. xvi. p. 170, *pictipes*, Stål, and var. *luteolus*, figs. 24 & 25, *ventralis*, Sign., fig. 23, p. 171, *Jadera obscura*, Stål (= *lateralis*, Stål), fig. 21, p. 172, *avola*, Dall, fig. 22, pl. xv., and *hæmatoloma*, Herr.-Schäff., pl. xvii. fig. 5, p. 173.

Prionotylus brevicornis, Muls. & Rey. Macropterous form described; Puton, Rev. d'Ent. i. pp. 114 & 115.

Coreus neglectus, Herr.-Schäff., = *Nemocoris falloui*, Sahlb.; *id. l. c.* p. 240.

Metapodius femoratus, Fabr., destroying larvæ of *Leucania unipuncta*, and hanging the empty skins on plants; Howard, Am. Nat. xvi. pp. 597 & 598.

Harmostes incisuratus, Distant, figured by Waterhouse, Aid, i. pl. xci.

Apodesmius, g. n., Scott, Ent. M. M. xix. p. 42. Not characterized; type, *Mictis* (?) *jansoni*, sp. n., *l. c.* p. 41, Chontales.

Eremoplanus, g. n., Reuter, Wien. ent. Z. i. p. 89. Allied to *Mirperus* and *Tupalus*; type, *E. mucronatus* (Klug, MS.), sp. n., *l. c.* p. 90, Arabia Deserta.

Spathocera tuberculata, sp. n., Horváth, Term. füzetek, v. p. 219, Hungary.

Macecevethus persicus, sp. n., Jakovleff, Bull. Mosc. lvi., 4, p. 354, Shahkuh.

Centrocarenus coroniceps, sp. n., id. Troudy Ent. Ross. xii. p. 52, Ararat.

Elasmonia serrata, sp. n., Signoret, Bull. Soc. Ent. Fr. (6) ii. p. lxiv., Silhet.

Sulpicia vicina, sp. n., *id. ibid.*, Gaboon.

Lygæidæ.

Distant (Biol. Centr. Am. *Rhynch. Het.*) notices and figures:—*Oncopeltus gutta*, Herr.-Schäff., pl. xvi. fig. 22, *sexmaculatus*, Stål, fig. 1, *varicolor*, Fabr., fig. 21, p. 174, and varr. *A. alternans*, Herr.-Schäff., and *stæli*, Dist. (from Mexico), fig. 20, *cingulifer*, Stål, figs. 24 & 25, p. 175, *fasciatus*, Herr.-Schäff., fig. 23, pl. xvi. p. 176, *Lygæus kalmi*, fig. 2, p. 178, *ruficeps*, Stål, fig. 3, *truculentus*, fig. 4, pl. xvii., *trux*, Stål, fig. 19, p. 179, *bicolor*, Herr.-Schäff., fig. 17, p. 180, *uhleri*, fig. 12, pl. xvi. p. 181, *pyrrhopterus*, pl. xvii. fig. 6, *dispar*, pl. xviii. fig. 5, *thoracicus*, fig. 16, p. 182, *pallido-cinctus*, fig. 11, pl. xvi., *pallescens* (and var. *a*), pl. xvii. figs. 7 & 10, *nigrinervis*, Stål, pl. xviii. fig. 7, *bicrucis*, Say, pl. xvi. figs. 14 & 15, p. 185, *nigriguttulus*, pl. xvii. fig. 11, *circumlitus*, pl. xvi. fig. 3, p. 186, *zubriger*, fig. 12, *vittiscutis*, fig. 14, pl. xvii., *lateralis*, Dall., fig. 1, p. 187, *variegatus*, De Geer, fig. 9, pl. xviii. p. 188, *Acroleucus brevicollis*, fig. 15, and *tullus*, Stål, fig. 16, p. 189, *Geocoris lividipennis*, Stål, fig. 27, pl. xvii., *flavilineus*, Stål, fig. 19, *thoracicus*, Fieb., figs. 15 & 16, *punctipes*, Say, fig. 14, p. 198, *borealis*, Dall., fig. 17, pl. xviii. p. 199, *Pachygrontha ædancalodes*, Stål, fig. 17, p. 200, *Ligyrocoris multispinus*, Stål, fig. 18, *litigiosus*, Stål, fig. 19, p. 201, *balteatus*, Stål, fig. 20, *abdominalis*, Guér., fig. 21,

p. 202, *Myodocha longicollis*, Stål, fig. 22, p. 203, *giraffa*, Stål, fig. 22, pl. xvii., *unispinosa*, Stål, pl. xviii. fig. 22, p. 204, *Heræus guttata*, Dall. pl. xix. fig. 11, p. 205, *Pamera longula*, Dall., pl. xvii. fig. 26, *parvula*, Dall., pl. xix. fig. 12, p. 206, *bilobata*, Say, pl. xvii. fig. 25, p. 207, and *globiceps*, Stål, pl. xix. fig. 16, p. 208, *Plociomera oblonga*, Stål, pl. xvii. fig. 24.

Horváth describes the following known species and varieties:—*Dimorphopterus spinolæ*, Sign., var. *geniculatus* from Hungary, *Microplax lineolata*, Herr.-Schäff. (= *Oxycarenus interruptus*, Fieb.), p. 220, *Metopoplax origani*, Kol. (= *Stenogaster ditomoides*, Herr.-Schäff., and *Microplax interruptus*, Fieb.), and var. *cingulata*, pp. 220 & 221; *Drymus sylvaticus*, Fabr., var. *orthopus* from Hungary and Transcaucasia, *Peritrechus nubilus*, Fall., var. *tibialis* from S. France and Lenkoran; *Tropidostethus sabuleti*, Hahn, var. *majusculus* from Transcaucasia, p. 222: Term. füzetek, v. *Cymus glandicolor*, Hahn, var. *simplex* from Lenkoran, p. 145, *Heterogaster nepetæ*, Fieb., var. *cinnamomeus* from Hungary, *Pachymerus bardanæ*, Preyssl., var. *flavatus* from the Caucasus, p. 147, and *Platyplax inermis*, p. 148; Wien. ent. Z. i.

Notes on the "Chinch Bug"; Riley's Rep. Ins. 1882, pp. 87–89. Noticed as infested with *Bacteria*; Forbes, Am. Nat. xvi. pp. 824 & 825.

Nysius. The synonymy of the species described by Fieber is as follows:—*N. thymi*, Wolff, Fieb. (= *maculatus* and *fuliginosus*, Fieb.); *helveticus*, Herr.-Schäff. (= *obsoletus*, Fieb.); and *N. punctipennis*, Herr.-Schäff. (= *brunneus*, Fieb.). Horváth, Wien. ent. Z. i. pp. 143–145. Puton, however (*l. c.* p. 223), maintains that *N. brunneus*, Fieb., is a variety of *obsoletus*, Fieb.

Plinthisus. Most of the species are both macropterous and micropterous; Horváth, *l. c.* pp. 146 & 147.

Cymus melanocephalus, malformation of antennæ; E. A. Butler, Ent. M. M. xix. p. 140.

New genera and species:—

Acompomorpha, Jakovleff, Troudy Ent. Ross. xii. p. 89. Allied to *Beosus*; type, *A. aterrima*, sp. n., *l. c.* p. 91, Derbent, Tiflis.

Hadrocnemis, id. *op. cit.* xiii. p. 147. Allied to *Hyalocoris*, Jak.; basal joint of hind tarsi as long as joints 2 and 3 together; legs and antennæ with rather long hair. Type, *H. crassicornis*, sp. n., *l. c.* p. 149, Kirghis Steppes.

Leptomelus, id. *l. c.* p. 150. Allied to *Lasiocoris*, Fieb.; head and pronotum with long hair; antennæ very slender; scutellum much shorter than the pronotum. Type, *L. dorsatus*, sp. n., *l. c.* p. 151, Shahrud.

Neoninus, Distant, Biol. Centr. Am. *Rhynch. Het.* p. 192. Allied to *Ninus*; first joint of antennæ distinctly passing the apex of the head, the second joint much longer than the fourth, which is about as long as the third, fourth joint strongly incrassated; head more elongate, eyes less prominently exserted, and the pronotum more elongate and narrowed anteriorly. Type, *N. illustris*, sp. n., *l. c.* p. 192, pl. xix. fig. 5, Guatemala.

Ninyas, id. *l. c.* p. 194. Allied to *Ninus* and *Neoninus*; eyes very

large and strongly exserted; antennæ with the basal joint passing the base of the head, second and fourth joints subequal in length, apical joint fusiform; anterior margin of the pronotum with a transverse lævigate callosity. Type, *N. strabo*, sp. n., *l. c.* pl. xix. fig. 6, Chiriqui.

Pseudopamera, id. *l. c.* p. 209. Allied to *Pamera*; type, *P. aurivilliana*, sp. n., *l. c.* pl. xx. fig. 8, Mexico.

Cholula, id. *l. c.* p. 210. Allied to *Pamera* and *Plociomera*; types, *C. variegata* and *bicolor*, spp. nn., *l. c.* p. 211, pl. xix. figs. 17 & 18, Guatemala.

Pephysena, id. *l. c.* p. 211. Allied to *Erlacda*; anterior tibiæ unarmed; and anterior lobe of pronotum only twice as long as posterior. Types, *P. lecis*, pl. xviii. figs. 24 & 25, Guatemala, and *insignis*, pl. xx. fig. 9, Panama, spp. nn., pp. 211 & 212.

Neocattarus, id. *l. c.* p. 213. Allied to *Cattarus* and *Pamphantus*; to include *N. firmus*, fig. 19, p. 213, *vegetus*, fig. 20, Panama, *vigens*, figs. 21 & 22, pl. xix., Guatemala, Panama, p. 214, *parvus* and *gracilis*, pl. xx. figs. 1 & 2, Guatemala, p. 215, spp. nn.

Trapezus, id. *l. c.* p. 217. Allied to *Trapezonotus*; head fully as long as broad, and (including margin of eyes) distinctly narrower than the anterior margin of pronotum; anterior femora thickened, but not spined, colour shining, not opaque. To include *T. trimaculatus*, fig. 4, Guatemala, *apicatus*, Mexico, Guatemala, and *fasciatus*, fig. 5, pl. xx., Guatemala, Panama, spp. nn., *l. c.*

Macropterna foveicollis, Costa, Atti Acc. Nap. ix., 6, p. 42, fig. 14, Calabria (= *marginalis*, Fieb., *sec.* Puton, Rev. d'Ent. i. p. 240).

Lygæosoma gibbicollis, Costa, Rend. Acc. Nap. xxi. p. 200, note, Sardinia.

Pterotmetus parnassius, Horváth, Wien. ent. Z. i. p. 254, Greece.

Diplonotus capitatus, id. Term. füzetek, v. p. 221 Lenkoran.

Nysius thoracicus, Horváth, Wien. ent. Z. i. p. 143, Baku.

Plinthisus (*Plinthisomus*) *pygmæus*, and *P. putoni*, id. *l. c.* pp. 145 & 146, Spain; *P.* (*Plinthosomus*) *fasciatus*, id. Term. füzetek, v. p. 222, Lesina; *P.* (*Isioscytus*) *heyi*, Puton, Rev. d'Ent. i. p. 185, E. Pyrenees and Catalonia.

Lygæus bilimeki, Mexico, *guatemalanus*, fig. 2, Guatemala, p. 181, *plagiatus*, fig. 11, Mexico, p. 182, *conjunctus*, fig. 3, pl. xviii., *interstinctus*, fig. 8, p. 183, *cruentatus*, fig. 9, pl. xvii., Panama, *venosus* (= *poeyi*, Guér., var. ?), pl. xvi. fig. 18, Mexico, Guatemala, Panama, p. 184, *verecundus*, pl. xviii. fig. 6, p. 185, *circumlinitus*, pl. xvii. fig. 13, *circumplicatus*, fig. 4, Guatemala, p. 186, *consanguinitus*, fig. 12, Mexico, p. 187, and *aureus*, fig. 13, pl. xviii., Mexico, p. 188, Distant, Biol. Centr. Am. *Rhynch. Het.*

Acroleucus subniger, Costa Rica, and *vicinalis*, Panama, *id. l. c.* pp. 188 & 189, pl. xviii. figs. 10 & 8.

Ninus notabilis, id. *l. c.* p. 191, pl. xix. fig. 4, Guatemala.

Ischnorrhynchus championi, fig. 3, *godmani*, fig. 1, p. 193, and *salvini*, fig. 2, p. 194, *id. l. c.* pl. xix., Guatemala.

Ischnodemus præcultus, id. *l. c.* p. 196, pl. xix. fig. 7, Guatemala; *I. obsoletus*, Jakovleff, Troudy Ent. Ross. xii. p. 71, Derbent.

Geocoris hirticornis, id. Bull. Mosc. lvi., 4, p. 355, Shahrud; *G. imperialis*, Distant, *l. c.* p. 197, pl. xviii. fig. 18, Guatemala.

Ligyrocoris delitus, pl. xviii. fig. 20, p. 201, *oblitus*, fig. 9, and *infamatus*, fig. 8, pl. xix. p. 202, Distant, *l. c.* Guatemala.

Myodocha intermedia, Mexico, Guatemala, and *inermibus*, pl. xvii. fig. 23, Chiriqui, *id. l. c.* pp. 203 & 204.

Heræus eximius, pl. xviii. fig. 21, p. 204, *percultus*, pl. xix. fig. 10, Guatemala, and *illitus*, Guatemala, Panama, p. 205, *id. l. c.*

Pamera vicinalis, Guatemala, p. 207, *dallasi* (= *lineatus*, Dall., *nec* Fabr.), Mexico, Guatemala, and *vivida*, Guatemala, p. 208, *id. l. c.* pl. xix. figs. 13–15.

Plociomera formosa and *cæca*, id. *l. c.* p. 210, pl. xix. figs. 25 & 24, Guatemala.

Rhyparochromus plenus, id. *l. c.* p. 216, pl. xix. fig. 23, Guatemala.

Emblethis solitarius, Jakovleff, *l. c.* p. 356, Kirghis Steppes.

Trapezonotus breviceps, id. *l. c.* p. 358, Batum; *T. caliginosus*, Distant, *l. c.* p. 216, pl. xx. fig. 3, Guatemala, Panama.

Eremocoris tropicus, id. *l. c.* p. 218, pl. xx. fig. 7, Guatemala.

Pyrrhocoridæ.

Distant (Biol. Centr. Am. *Rhynch. Het.*) figures *Largus convivus*, Stål, figs. 13 & 14, *longulus*, Stål, fig. 15, *cinctus*, Herr.-Schäff., figs. 16–18, *bipustulatus*, Stål, figs. 20 & 21, *Fibrenus globicollis*, Burm., figs. 24 & 25, pl. xx., and *gibbicollis*, Stål, pl. xxi. fig. 1.

Lohita grandis, Gray, var. *sumatrana*, described; *id.* Ent. M. M. xix. p. 158.

Gonatas, g. n., Distant, Biol. Centr. Am. *Rhynch. Het.* p. 219. Placed next to *Eremocoris*; to include *G. typicus* (type) and *divergens*, spp. nn., *l. c.* pl. xx. figs. 6 & 10, both from Guatemala and Panama.

Largus subligatus and *affinis*, spp. nn., *id. l. c.* pp. 221 & 222, pl. xx. figs. 11 & 12, Guatemala.

Tingididæ.

Tingis hystricellus, Richter. Sudden re-appearance in abundance; Green, Sci. Goss. xviii. p. 161. *T. pyri* produces three kinds of spots on leaves, (1) round spots (its excrements), (2) raised spots, each containing an egg, and (3) minute punctures; it is the excrements which are most injurious to infested trees: Carlet, C. R. xcv. p. 1012.

Eurycera brevicornis, sp. n., Jakovleff, Troudy Ent. Ross. xii. p. 103, Derbent.

Monanthia (*Platychila*) *balassogloi*, and *M.* (*Tropidochila*) *angustipennis*, id. *l. c.* pp. 105 & 107, Derbent, &c., spp. nn.

Campylostira orientalis, sp. n., Horváth, Term. füzetek, v. p. 223, Hungary, Dalmatia, Transcaucasia.

Orthostira subtilis, sp. n., Reuter, Bull. Soc. Ent. Fr. (6) ii. p. cxxx., Lenkoran.

Aradidæ.

Aradus depressus, Fabr., var. *leptocerus* from Lenkoran described; Horváth, Term. füzetek, v. p. 223.

CAPSIDÆ.

Globiceps selectus, Fieb., = *flavo-maculatus*, Fabr., Fall.; *flavo-maculatus*, Fieb., = *cruciatus*, Reut.; *flavo-maculatus*, var. 1, Sahlb., = *fulvipes*, Reut., *nec* Scop., = *salicicola*, Reut.; *dispar*, Boh., discussed; *flavo-quadri-maculatus*, De Geer(= *flavo-notatus*, Boh.), belongs to *Cyllocoris*: Reuter, Ent. Tidskr. iii. pp. 191 & 192.

Sthenarus vittatus, Fieb., and *Systratiotus holosericeus*, Hahn, recorded as new to Belgium; Lethierry, CR. Ent. Belg. xxvi. p. ciii.

Orthocephalus tennicornis, Muls., *vittipennis*, Herr.-Schäff., and *bivit-tatus*, Fieb.: forma macroptera, ♀, described, Horváth, Term. füzetek, v. p. 224. *O. debilis*, Reut., noticed; Rey, Ann. Soc. L. Lyon (2), xxviii. p. 129.

Malacotes mulsanti, Reuter, ♂ described by him; Rev. d'Ent. i. pp. 136 & 137.

Isometopius mirificus, Rey, various forms described by him; *l. c.* pp. 278 & 279.

Lamocoris, g. n., Jakovleff, Bull. Mosc. lvi., 4, p. 364. Affinities not stated; placed between *Myrmecocoris* and *Macrotylus*. Type, *L. reitteri*, sp. n., *l. c.* p. 365, Krasnovodsk.

New species:—

Calocoris sanguineus, Jakovleff, Bull. Mosc. lvi., 4, p. 359, Batum; *C. suturalis*, Amur, and *fulvus*, Vladivostok, *id.* Troudy Ent. Ross. xiii. pp. 169 & 170; *C. reuteri*, Horváth, Term. füzetek, v. p. 223, Brussa.

Pœciloscytus (*Systratiotus*) *carpathicus*, id. *l. c.* p. 224, North Hungary.

Labops putoni, Reuter, Rev. d'Ent. i. p. 277, France.

Pachytoma nigrita, Jakovleff, Bull. Mosc. lvi., 4, p. 360, Orenburg.

Anapus longicornis, id. *l. c.* p. 361, Orenburg.

Myrmecocoris rubricatus, id. *l. c.* p. 362, Orenburg.

Macrotylus fulvicornis, id. *l. c.* p. 364, Sarepta; *M. attenuatus*, id. Troudy Ent. Ross. xiii. p. 172, Sarepta.

Criocoris fuscipennis and *ater*, id. *l. c.* pp. 173 & 174, Sarepta.

Lygus elegantulus and *L.* (*Orthops*) *caucasicus*, id. *l. c.* xii. pp. 123 & 125, Caucasus.

Euryopicoris reuteri, id. *l. c.* p. 134, Derbent.

Oncotylus affinis, Krasnovodsk, and *plumicornis*, Sarepta, *id.* Bull. Mosc. lvi., 4, pp. 367 & 369; *O. komaroffi*, id. Troudy Ent. Ross. xii. p. 139, Derbent.

Amblytylus (?) *ornatulus*, id. *l. c.* xii. p. 140, Derbent.

Atractotomus nigritarsis, id. Bull. Mosc. lvi., 4, p. 370, Orenburg.

Leucopterum transversum, id. Troudy Ent. Ross. xiii. p. 127, Derbent.

Campylomma similima[*-mum*], id. *l. c.* p. 129, Petrovsk.

Gnathoconus notatus, id. *l. c.* p. 141, Amur.

ANTHOCORIDÆ.

Dicyphus pallidus, Reut., Thoms. (*nec* Herr.-Schäff.), = *constrictus*, Boh.; *collaris*, Fall., = *errans*, Wolff; *collaris*, Flor, = *stachydis*, Reut.; *globulifer*, Fall., discussed: Reuter, Ent. Tidskr. iii. pp. 192, 193, & 208.

Anthocoris nemoralis, Sahlb., Reut. (*nec* Fabr.), renamed *confusus*; *A. pratensis*, Hahn, Fieb., = *nemoralis*, Fabr., = *gallarum-ulmi*, De Geer, *pratensis*, Fabr., = *sylvestris*, L., = *nemorum*, L.: *id. l. c.* pp. 193, 194, & 208.

Schizoptera cicadina, Fieb. Genus and species recharacterized, and 3 new species described; *id.* Rev. d'Ent. i. pp. 162–164.

Cimex. *C. lectularius* is the only species yet detected in Holland; Fokker, Tijdschr. Ent. xxv. p. xvii.

Schizoptera flavipes, Rio Janeiro, *apicalis*, p. 163, and *brachycera*, Pernambuco, p. 164, Reuter, Rev. d'Ent. i.: spp. nn.

Cimex improvisus, sp. n., *id.* Wien. ent. Z. i. p. 307, Austria.

Piezostethus signatus, sp. n., Jakovleff, Troudy Ent. Ross. xii. p. 148, Derbent.

Saldidæ.

Salda gracilipes and *fenestrata*, Jakovleff, Troudy Ent. Ross. xii. pp. 151 & 152, Caucasus; *C. longicornis*, id. *op. cit.* xiii. p. 133, Derbent: spp. nn.

Reduviidæ.

Reuter, O. M. Ad cognitionem Reduviidarum mundi antiqui. Not. Fenn. xii. pp. 269–339. [*Cf.* Zool. Rec. xviii. *Ins.* p. 290.]

Only mentioned here to give the pagination in the completed volume.

——. Monographia generis *Oncocephalus*, Klug, proximeque affinium. *L. c.* pp. 673–758, pls. i.–iii.

Contains descriptions and figures of *Oncocephalus* (55 species), *Nurvesus*, Stål (1 species), and *Caunus*, Stål (3 species), including many new ones. 4 species and a variety, described by Fairmaire and Walker, are mentioned as unknown to the author.

Acanthothorax siculus, Costa, nymph, 11, p. 38, *Metapterus linearis*, Costa, and *Harpactor hæmorrhoidalis*, Fabr., 6, p. 44, noticed; Costa, Atti Acc. Nap. ix.

Pirates hebridus. Severe effects of its puncture; Waga, Le Nat. ii. pp. 45 & 46.

Ectmetacanthus, g. n., Reuter, Wien. ent. Z. i. p. 111. Allied to *Acanthaspis*; type, *E. annulipes*, sp. n., *ibid.*, Chinchoxo.

New species:—

Holotrichius grimmi and *apterus*, id. *l. c.* pp. 162 & 163, Baku, &c.
Reduvius ciliatus, id. *l. c.* p. 165, Derbent.

Notonectidæ.

New species:—

Oncocephalus (*Bæbius*) *obscurus*, fig. 1, Cape, p. 684, *O. gularis*, fig. 7, Portugal, p. 692, *15-spinulosus*, fig. 8, Guinea, p. 693, *germari*, fig. 9, Manilla, p. 694, *annulirostris*, fig. 10, Cape, p. 695, *angulatus*, Mauritius, Johanna, fig. 11, p. 696, *acutangulus*, fig. 12, Morocco, Algeria, p. 697, *brevipennis*, fig. 14, Andalusia, p. 699, *schiœdtii*, Serampore, p. 702,

femoratus, fig. 16, Philippines, p. 704, *fuscescens*, fig. 17, Sierra Leone, p. 705, *assimilis*, fig. 19, Philippines, Java, p. 707, *confusus*, fig. 20, Australia, p. 708, *scutellaris*, fig. 21, China, Borneo, p. 709, *curvispina*, fig. 22, pl. i., Australia, New Caledonia, p. 710, *dasycnemis*, fig. 23, Caffraria, p. 711, *tibialis*, fig. 24, Adelaide, p. 712, *antipodus*, Ecuador, Guayaquil, p. 713, *validispinis*, fig. 25, Bahia, *impudicus*, figs. 26 & 27, India, Java, Sumatra, Borneo, p. 715, *modestus*, fig. 28, Calcutta, p. 716, *fuscicornis*, fig. 30, Adelaide, p. 718, *parvulus*, fig. 31, Addah, p. 720, *putoni* (= *notatus*, Stål, *nec* Klug), fig. 33, p. 722, *curtipennis*, Algeria, p. 723, *cincticrus*, fig. 34, Adafoah, p. 725, *apiculatus*, fig. 36, N. America, p. 728, *signoreti*, fig. 37, Sierra Leone, p. 729, *brachymerus*, fig. 38, S. Russia, Cyprus, Astrachan, Turkestan, p. 730, *fuscinotum*, fig. 39, Lahore, p. 731, *pilosulus*, fig. 41, pl. ii., Pulo Penang, p. 734, *pilosus*, fig. 42, N. India, p. 735, *breviscutum*, fig. 42, Batavia, p. 736, *fuscipes*, fig. 43, Tangiers, p. 738, *aspericollis*, fig. 44, Syria, p. 739, *aurivillii*, fig. 48, Madagascar, p. 745, *variegatus*, fig. 49, p. 747, and *dilatatus*, fig. 50, pl. iii., Chinchoxo, p. 747, Reuter, Act. Fenn. xii.

Caunus dolichomerus, Caffraria, Guinea, and *farinator*, Tranquebar, *id. l. c.* pp. 751 & 752, pl. iii. figs. 53 & 55.

Corynus leucopterus, id. Term. füzetek, v. p. 225, Syria; *C. lateralis*, Jakovleff, Troudy Ent. Ross. xii. p. 158, Caucasus.

Panthous cocalus and *talus*, Distant, Ent. M. M. xix. pp. 158 & 159, Sumatra.

Notonecta heydeni, sp. n., Deichmüller, Verh. L.-C. Ak. xlii. p. 328, pl. xxi. figs. 16–18, Kutschina (fossil).

Corisidæ.

Gerris lacustris hibernating far from water; Douglas, Ent. M. M. xix. p. 20.

Corisa assimilis, Fieb. Shower during a storm in Turkistan; Balassoglo & Puton, Rev. d'Ent. i. pp. 22 & 23.

HEMIPTERA-HOMOPTERA.

Lichtenstein, J. Les Pucerons des Orangers. Assoc. Fr. x. pp. 676–679.

The following species are noticed:—*Mytilaspis flavescens*, Targ.-Tozz., *Parlatoria zizyphi*, Luc. (=*Chermes aurantii*, Boisd., and *Diaspis monserrati*, Colvé), *Aspidiotus limenii*, Sign., and *Dactylopius hesperidum*, L. (= *Lecanium oleæ*, Latr.). The second and fourth of these exhibit a remarkable change of colour in caustic potash; the third does not.

Pascoe, F. R. Note on the classification of the *Homoptera*. Ann. N. H. (5) ix. pp. 424 & 425.

It is proposed to divide the *Homoptera* into 17 families, which are tabulated.

Cicadidæ.

Berg, C. Contribuciones al estudio de las *Cicadidæ* de la República Argentina y paises limítrofes. An. Soc. Arg. xiv. pp. 38–48.

11 species noticed, mostly new. The following synonymy occurs:—

Tettigades chilensis, Am & Serv. (= *Fidicina crassivena*, Walk.), *Tympanoterpes gigas*, Oliv. (= *Cicada triupsilon, sonans, consonans, vibrans*, Walk., *T. grossa*, pt., Stål, *nec* Fabr., and *T. sibilatrix*, Berg), *T. striricosta*, Germ. (= *Fidicina pusilla*, Berg). *Proarna pulverea*, Oliv., and *dactyliophora*, Berg, are also noticed.

Hasselt, A. W. M. Van. Studien over de Klank-Organen, den Zang en den Schreeuw der Cicaden. Tijdschr. Ent. xxv. pp. 179–212.

An elaborate anatomical paper, of which it is impossible to give any abstract.

Platypleura. Range, &c., noticed; Distant, Ent. M. M. xix. p. 67.

Cicada mœrens, Germ., figs. 1, 1*a*–1*d*, 2, 2*a*–2*e*, 3, 3*a*, & 3*b*, and *Cyclochila australasiæ*, Don., figs. 4, 4*a*, 5, & 6, redescribed and both sexes figured, with details; McCoy, Prodr. Zool. Vict., Dec. v. pl. l. [1880].

Cicada synodica and *rimosa*, Say, and *putnami*, Uhler, noticed; Putman, P. Davenp. Ac. iii. pp. 67 & 68. *C. kuruduadua*, Dist., figured by Waterhouse; Aid, i. pl. c.

Cicadetta montana in the Rhine Province; Bertkau, Verh. Ver. Rheinl. xxxix. p. 127.

New genera and species:—

Derotettix, Berg, An. Soc. Arg. xiv. p. 46 (neuration figured). Intermediate between *Stagira* and *Callipsaltrix*, Stål; type, *D. mendosensis*, sp. n., *l. c.* p. 47, Mendoza.

Malagasia, Distant, Tr. E. Soc. 1882, p. 336. Allied to *Prasia*, Stål, but with an amplified apical space between the post-costal vein and the post-costal ulnar ramus. Type, *M. inflata*, sp. n., *l. c.* p. 337, pl. xv. figs. 2 & 2*a*–*d*, Madagascar.

Arcystasia, id. P. Z. S. 1882, p. 133. Allied to *Cystosoma* and *Acrilla*; type, *A. godeffroyi*, sp. n., *ibid.* pl. viii. figs. 1, 1*a*, & 1*b*, Ponape (Caroline Archipelago).

Tettigades papa, Berg, An. Soc. Arg. xiv. p. 38, Mendoza.

Tympanoterpes elegans, id. *l. c.* p. 40, Argentine Republic, Uruguay, Brazil.

Platypleura angusta and *evanescens*, Butler, Ann. N. H. (5) ix. p. 389, Antananarivo; *P. pulverea*, Distant, Tr. E. Soc. 1882, p. 335, pl. xv. figs. 1, 1*a*, & 1*b*, Madagascar.

Dundubia bocki, Distant, Ent. M. M. xix. p. 159. Sumatra.

Cosmopsaltria stuarti, id. P. Z. S. 1882, p. 125, pl. vii. figs. 2, 2*a*, & 2*b*, Fiji.

Tibicen burkii, figs. 3, 3*a*, & 3*b*, p. 126, *willsi*, figs. 4, 4*a*, & 4*b*, Peak Downs, &c., *gilmorii*, figs. 8, 8*a*, & 8*b*, Swan River, p. 127, *muelleri*, figs. 6, 6*a*, & 6*b*, p. 128, and *gregorii*, figs. 7, 7*a*, & 7*b*, Peak Downs, p. 129, *id. l. c.* pl. vii.

Melampsalta forresti, figs. 10, 10*a*, & 10*b*, Queensland, &c., *warburtoni*, figs. 9, 9*a*, & 9*b*, p. 129, *eyrii*, figs. 12, 12*a*, & 12*b*, *mackinlayi*, figs. 13, 13*a*, & 13*b*, p. 130, *oxleyi*, Peak Downs, *landsboroughi*, figs. 14, 14*a*, & 14*b*, Sydney, p. 131, and *leichardti*, figs. 5, 5*a*, & 5*b*, Peak Downs, p. 132, *id. l. c.* pl. vii.

Cystosoma schmeltzi, id. *l. c.* p. 132, pl. vii. figs. 11, 11*a*, & 11*b*, Gayndah.

Proarna uruguayensis and *montevidensis*, Berg, *l. c.* pp. 43 & 44, Monte Video.

Carineta platensis, id. *l. c.* p. 45, Buenos Aires.

Cercopidæ.

Triecphora dorsata, Germ., var. *lugens* from Dalmatia described; Horváth, Term. füzetek, v. p. 225.

Cosmoscarta juno, sp. n., Distant, Ent. M. M. xix. p. 160, Sumatra.

Fulgoridæ.

Phenax (*Lystra*) *auricoma*, Lucas. Cottony secretion noticed; Lucas, Bull. Soc. Ent. Fr. (6) ii. pp. cxxx. & cxxxi.

Aphæna chionæma, sp. n., Butler, Ann. N. H. (5) ix. p. 127, Sumatra.

Histeropteron camelus, sp. n., Costa, Atti Acc. Nap. ix., 11, p. 38, Sardinia.

Liburnia insignis, sp. n., Scott, Ent. M. M. xviii. p. 270, Pitlochry, Perthshire.

Membracidæ.

Ceresa bubalus, Fabr. Injurious to potatoes; Hellman & Riley, Am. Nat. xvi. pp. 822 & 823.

Iassidæ.

Gnathodus frontalis, Ferrari, probably = *roseus*, Scott; *Pediopsis ulmi*, Scott, = *glandacea*, Fieb., and *Idiocerus heydeni* and *lituratus*, Edw., = *pœcilus* and *adustus*, Herr.-Schäff., respectively; Puton, Rev. d'Ent. i. pp. 119 & 240.

Platymetopius undatus, De Geer, recorded as new to Britain; Bignell, Ent. xv. pp. 282 & 283, and Fitch, P. E. Soc. 1882, p. xxii. Redescribed; Scott, Ent. M. M. xix. pp. 154–156.

Phlepsius viridinervis, Fieb. (nec *Thamnotettix viridinervis*, Kirschb.), referred to the genus *Platymetopius*, and redescribed; Löw, Wien. ent. Z. i. pp. 55–60.

Deltocephalus xanthoneurus, Fieb. The nymph is attacked by *Gonatopus pilosus*, Thoms.; Mik, Wien. ent. Z. i. pp. 215–221, pl. iii., and Douglas, Ent. M. M. xix. pp. 116 & 142.

Errhomenus brachypterus, Fieb., recorded as new to Belgium; Lethierry, CR. Ent. Belg. xxvi. p. ciii.

Eupteryx vittatus, Linn. Food-plants; Douglas & E. A. Butler, Ent. M. M. xix. pp. 67, 89, & 115.

Psyllidæ.

Löw, F. Revision der paläarktischen Psylloden in Hinsicht auf Systematik und Synonymie. Verh. z.-b. Wien, xxxii. pp. 227–254.

A most important paper, consisting of a critical revision of all the known species; but it is impossible to give any abstract of its contents here.

Scott, J. On certain genera and species of the group of *Psyllidæ* in the collection of the British Museum. Tr. E. Soc. 1882, pp. 449–473, pls. xviii. & xix.

Chiefly consists of descriptions of new genera, and of the species referred to them.

——. Food-plants and times of appearance of the species of *Psyllidæ* found in Great Britain, together with others which may be expected to occur here. Ent. M. M. xix. pp. 13–15.

List of British *Psyllidæ*, with corrections of the synonymy; Scott, Ent. M. M. xviii. pp. 253–256.

Catalogue of *Psyllidæ* of the Palæarctic regions; Löw, Wien. ent. Z. i. pp. 209–214.

Aphalara and *Rhinocola*, Först., differentiated, with list of species referable to each genus; *id. l. c.* pp. 1–6, pl. (fore-wings of 14 species).

Aphalara nebulosa, Zett., noticed and eggs described; Scott, Ent. M. M. xviii. p. 275, xix. pp. 42 & 43. *A. nervosa*, Först., nymph described; *id. l. c.* xix. pp. 20 & 21.

Trioza erithmi, Löw, recorded as new to Britain, and described in all stages; Scott & Gosse, Ent. M. M. xviii. p. 276, xix. pp. 64–66. *T. dispar*, Löw, recorded as new to Norway; Reuter, Ent. Tidskr. iii. pp. 194 & 20[illegible]

Prionocnemidæ, fam. (vel subfam.?) nov., Scott, Tr. E. Soc. 1[illegible], p. 466. Includes *Carsidara marginalis* and *Tyora congrua*, Walk.: genera and species redescribed; *l. c.* pp. 466–472, pl. xix. figs. 4–4*f* & 5–5*c*.

Livillinæ, subfam. nov., *id. l. c.* p. 462. To include *Livia* and allies.

New genera and species:—

Neolithus, Scott, Tr. E. Soc. 1882, p. 445. Affinities not stated; type, *N. fasciatus*, sp. n., *l. c.* p. 446, pl. xviii. figs. 2 & 2*a–f*, Buenos Aires and Uruguay.

Thea, id. *l. c.* p. 450. *Aphalarinæ*; type, *Psylla trigutta*, Walk., redescribed and figured, p. 451, pl. xviii. figs. 3 & 3–*d*.

Phytolyma, id. *l. c.* p. 453. Placed next to last; type, *Psylla* (?) *lata*, Walk., redescribed and figured, *l. c.* p. 454, pl. xviii. figs. 4–4*f*.

Phystolyma, id. *l. c.* p. 456. Placed next to last; type, *Psylla fracticosta*, Walk., redescribed and figured, *l. c.* p. 457, pl. xviii. figs. 5–5*e*; add *Aphalara arctica*, Walk., noticed and figured, p. 459, pl. xix. figs. 1–10.

Petalolyma, id. *l. c.* p. 459. *Triozinæ*; type, *Psylla basalis*, Walk., redescribed and figured, *l. c.* p. 460, pl. xix. figs. 2–2*f*.

Creiis, id. *l. c.* *Livillinæ*; type, *Livia longipennis*, Walk. (♀ = *Psylla livioides*, Walk.), redescribed and figured, *l. c.* p. 463, pl. xix. figs. 3–3*e*.

Rhinocola cisti, Puton, Rev. d'Ent. i. p. 183, Hyères.

Psylla duvauæ, Scott, Tr. E. Soc. 1882, p. 443, pl. xviii. figs. 1 & 1*a–1g*, Buenos Aires; *P. sarmatica*, Löw, Wien. ent. Z. i. p. 93, figs. 1–3, South Russia.

Aphididæ.

Ashmead, W. H. On the *Aphididæ* of Florida, with descriptions of new species. Canad. Ent. xiv. pp. 88–93.

Deals with *Siphonophora*, Koch. Dimorphism is discussed, and 34 species are enumerated.

Brass, A. Das Ovarium, und die ersten Entwicklungsstudien des Eies der viviparen Aphiden. Z. ges. Naturw. lv. pp. 339–375, pl. i.

After describing the ovary, and the earlier processes of development of the ovum, the author gives a sketch of the observations of previous writers, and compares them with his own.

Courchet, L. Étude sur les galles causées par des Aphidiens. Mem. Ac. Montp. x. pp. 1–102, pls. i.–vi.

The author divides his work into two parts: part i. deals with the evolution, morphology, and structure of galls, and treats of galls in general, and those of the *Terebinthiaceæ*, the black poplar, and the elm in particular; part ii. treats of perfect insects.

Macchiati, L. Aggiunta agli Afidi di Sardegna. Bull. Ent. Ital. xiv. pp. 243–249.

——. Specie di Afidi che virono nelle piante della Sardegna settentrionale, con qualche nozione sul polimorfismo di detti insetti. *L. c.* pp. 331–337.

Includes a list of species.

Monell, J. Notes on *Aphididæ*. Canad. Ent. xiv. pp. 13–16.

Includes notes on several known species, descriptions of new ones, and a table of the N. American species of *Callipterus*, Koch.

Osborn, H. Notes on *Pemphigus tessellatus*, Fitch. Canad. Ent. xiv. pp. 61–65.

The earliest record of this insect is *Chermes alni*, Kalm., *nec* Linn. Osborn redescribes the insect, and gives some account of its anatomy, especially remarking that above the channel leading to the gullet, formed by the epi- and hypo-pharynx, are eight light spots, with dark borders; analogous organs, probably organs of sense, occur in other *Hemiptera* and *Hymenoptera*.

Witlaczil, E. Zur Anatomie der Aphiden. Zool. Anz. v. pp. 239–241.

Relates to the sucking apparatus, intestinal canal, pseudovitellus, excretory tube, tracheal system, and brain.

Balbiani replies to Lichtenstein's views on alternation of generations in *Aphidæ*; C. R. xiv. pp. 1299–1302.

Experiment on destroying *Aphides* by submersion in water; Laboulbène, Bull. Soc. Ent. Fr. (6) ii. pp. cxxxiv. & cxxxv.

Siphonophora rosæ, var. *floridæ* described; Ashmead, Canad. Ent. xiv. p. 88.

Aphis lanigera, &c., destroyed by *Scymnus arcuatus*, Rossi; Ann. Soc. L. Lyon (2) xxviii. pp. 131 & 132. *A. mali* noticed; Bethune, Rep. E. Soc. Ont. 1881, pp. 77–79, figs. 45 & 46.

Schizoneura lanigera, Hausm. (American Blight), described and figured; *id. l. c.* pp. 74–76, figs. 42 & 43.

Lachnus viminalis. Colouring matter; Müller, P. Eastbourne Soc. Nov. 1881, and J. R. Micr. Soc. (2) ii. p. 39.

Planchonia hederæ, Lichtenstein, renamed by him *ralloti*, because it

was previously discovered, though not named, by Vallot [!]; Bull. Soc. Ent. Fr. (6) ii. p. lxxv.

Phylloxera vastatrix. Numerous general observations scattered through C. R. xciv. & xcv. Natural history, methods of destroying, &c.; Gardner, Nature, xxvi. p. 38; Boiteau, C. R. Assoc. Fr. ix. pp. 1070 & 1071; Novi, Atti Ist. Nap. xvi. pp. 96–242; W. Saunders, Canad. Ent. xiv. pp. 121–128, figs. 14–19. Winter egg; Targioni-Tozzetti, Bull. Ent. Ital. xiv. pp. 320–322. Its attacks predispose the vine to the affection known as "pourridie"; Millardet, Mém. Soc. Bord. (2) iv. pp. 213–252, pls. i.–iii. Its occurrence in the Valley of the Ahr; Bertkau, Verh. Ver. Rheinl. xxxix. pp. 125–127.

Cerataphis, g. n., Lichtenstein, Bull. Soc. Ent. Fr. (6) ii. p. xvi.; Ent. M. M. xviii. p. 275. Allied to *Vacuna*, but with two little conical pointed horns between the antennæ under the forehead; type, *Coccus lataniæ*, Boisd. (= *Boisduvalia lataniæ*, Sign.) *Cf.* also Lichtenstein & Signoret, Bull. Soc. Ent. Fr. (6) ii. pp. xxxv., lxxiv. & lxxv.; C. R. xciv. pp. 1062 & 1063.

New species :—

Myzus matricariæ, Macchiati, Bull. Ent. Ital. xiv. p. 245, Sardinia.

Aphis myopori, id. *l. c.* p. 247, Sardinia.

Callipterus trifolii, Monell, Canad. Ent. xiv. p. 14, St. Louis.

Pemphigus populi, Courchet, Mém. Ac. Montp. x. pp. 46 & 86, pls. iii. figs. 2, 3, & 3*a*, v. fig. 2, vi. figs. 1 & 5; Montpellier (on black poplar). *P. nidificus*, Löw, Wien. ent. Z. i. pp. 13–19, Vienna. *P. aceris*, Monell, *l. c.* p. 16, Illinois.

Tetraneura rubra, Lichtenstein, C. R. xcv. pp. 1171–1173, France: on elm (transformations described). *T. graminis*, Monell, *l. c.* p. 16, Missouri.

Siphonophora solanifolii, Ashmead, Canad. Ent. xiv. p. 92, Florida.

Coccidæ.

Maskell, W. M. Further Notes on *Coccidæ* in New Zealand, with descriptions of new species. Tr. N. Z. Inst. xiv. pp. 215–229, pls. xv. & xvi.

The following known species are noticed:—*Mytilaspis pyriformis*, Mask., p. 215, pl. xv. figs. 1–4, *Aspidiotus aurantii*, Mask., *nerii*, Bouché, *Fiorinia astelia*, Mask., p. 217, *Ctenochiton spinosus*, Mask., p. 218, *Inglisia patella*, Mask., p. 219, and *Iceria purchasi*, Mask.

Notes on *Coccidæ*; Aurivillius, Ent. Tidskr. iii. pp. 197 & 215. On the males, &c., of various species; Lichtenstein & Signoret, Bull. Ent. Ital. xiv. pp. 329 & 330, Bull. Soc. Ent. Fr. (6) ii. pp. xxxvi.–xxxviii., clxxxiii.–clxxxv.

Larvæ of *Coccidæ* probably carried from tree to tree by *Coccinellidæ* and birds: Hubbard, Am. Nat. xvi. pp. 411 & 412.

On destroying *Coccidæ* on orange, &c.; Comstock, Riley, & Hubbard, Rep. Ins. 1881, pp. 14–17, 1882, pp. 106–127, 206–209.

Aspidiotus abietis, Schrank (= *arborum*, Schrank, *nec* Geoffr., = *flavus*,

♂, Hart., = *pini*, ♀, Hart.), and *Leucaspis pini*, Hart. (= *flavus*, ♀, Hart., = *candida*, Targ.), discussed; Löw, Wien. ent. Z. i. pp. 270–275.

Lecanium ribis, Fitch, noticed; Douglas. Ent. M. M. xix. p. 88.

Chermes abietis. Galls fed upon by larvæ of *Eupithecia togata*; Schmidt, Ent. Nachr. viii. p. 319.

Dactylopius. Structure described; Comstock, Rep. Ins. 1881, p. 22, Riley, Rep. Ins. 1882, p. 214.

Carteria lacca, Kerr. Life-history; Comstock, *l. c.* pp. 17–19, pl. xix. figs. 2–2*g*; Riley, *l. c.* pp. 209–211, pl. xix. figs. 2–2*g*.

Inglisia, Mask. (misprinted *Inglina*), is distinct from *Spondyliaspis*, Sign.; Signoret, Bull. Soc. Ent. Fr. (6) ii. pp. clxxxiii. & clxxxiv.

Acanthococcus aceris, Sign. Life-history; Löw, Wien. ent. Z. i. pp 81–85. Apterous ♂ described; *id. l. c.* p. 60; Lichtenstein, C. R. xciv. pp. 499–501, Ann. N. H. (5) ix. pp. 404 & 405, S. E. Z. xliii. pp. 345–347, Ent. M. M. xviii. pp. 250 & 251.

Rhizœcus falcifer, Künck., noticed; Signoret & Künckel d'Herculais, Bull. Soc. Ent. Fr. (6) ii. pp. xxxv. & xlix.

Orthezia cataphracta, Shaw, noticed; Löw, *l. c.* p. 190.

Villigera frauenfeldi, Karsch, is not a Cecidomyid, but a Coccid; Mik, Wien. ent. Z. i. p. 63.

Lecaniococcidæ, subfam. n., Maskell, Tr. N. Z. Inst. xiv. p. 223. Subsection of *Coccidæ*; insect possessing the anal tubercles of *Coccus* in all stages, covered by a test; mentum monomerous. Typical genus, *Planchonia*, Sign.

New genera and species:—

Cerococcus, Comstock, Rep. Ins. 1881, p. 21; Riley, Rep. Ins. 1882, p. 213. Allied to *Ceroplastes*; adult ♀ apodous; waxy secretion forming a continuous sheet. Type, *C. quercus*, sp. n., *ll. cc.* pl. xi. figs. 2 & 2*e*, Arizona.

Tetrura, Lichtenstein, Bull. Soc. Ent. Fr. (6) ii. p. lxxv.; Wien. ent. Z. i. p. 124; Ent. M. M. xviii. p. 275. Allied to *Dactylopius*; ♀ oval, with eight-jointed antennæ; ♀ with ten-jointed antennæ, and four setæ, the interior pair as long as the whole insect, and the exterior as long as the wings. Type, *Coccus rubi*, Schrank.

Xylococcus, Löw, Verh. z.-b. Wien, xxxii. p. 274. Adult ♀: body oval or pear-shaped, not depressed, enclosed by a wax-like covering; antennæ and legs wanting; rostrum very short, conical, not jointed, anal segment semiglobose, harder than the rest of the body, ending in a short conical tube, from which proceeds a large cylindrical hollow thread formed of secreted matter; larva depressed, provided with legs, antennæ six-jointed. Type, *X. filiferus*[*-fer*], sp. n., *l. c.* pl. xvii., Lower Austria, on *Tilia grandifolia*, Ehr.

Lecanochiton, Maskell, Tr. N. Z. Inst. xiv. p. 221. *Lecaniidæ*; apodous in adult stage; adult ♀ covered by a test formed partly of the pellicle of the second stage, partly by a hard, apparently chitinous, secretion. Type, *L. metrosideri*, sp. n., *l. c.* p. 222, pls. xv. figs. 18 & 19, xvi. figs. 20–22, New Zealand.

Mytilaspis longirostris, Signoret, Bull. Soc. Ent. Fr. (6) ii p. xxxv.,

Paris, on *Napoleona heudloti* (probably introduced from Senegal); *M. leptospermi*, Maskell, Tr. N. Z. Inst. xiv. p. 215, New Zealand.

Chionaspis dubia, id. *l. c.* p. 216, New Zealand.

Ctenochiton piperis, id. *l. c.* p. 218, pl. xv. figs. 5–8, New Zealand.

Inglisia leptospermi, id. *l. c.* p. 220, pl. xv. figs. 9–17, New Zealand.

Planchonia epacridis (? sp. n.), id. *l. c.* p. 224, pl. xvi. figs. 30–37, Amberley, N. Z.

Celostoma zealandicum, id. *l. c.* p. 226, pl. xvi. pp. 23–29, New Zealand.

Chilaspis loewi, Wachtl, Wien. ent. Z. i. p. 291, pl. iv. figs. 2 & 2*c* (galls), Vienna.

Carteria tarreæ, pl. xx. figs. 1–1*h*, United States, Mexico, and *mexicana*, pl. xix. figs. 1–1*h*, Mexico, Comstock, *l. c.* pp. 19 & 20; Riley, *l. c.* pp. 211 & 212, same plates.

(ANOPLURA.)

Pediculidæ.

List of *Anoplura*, &c., of the Pavia Museum; Simonetto, Bull. Ent. Ital. xiv. pp. 204–220.

Idolocoris elephantis, Richter, = *Hæmatopinus elephantis*, Piaget; Cobbold, Tr. L. S. (2) ii. p. 249.

VERMES.

BY

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PLATYHELMINTHES.

1. BRAUN, M. Zur Frage des Zwischenwirthes von *Bothriocephalus latus*. II., III. Zool. Anz. v. pp. 39–43 (see also p. 46); IV. pp. 194–196.

2. ERCOLANI, G. B. De l'adaptation des espèces au milieu ambiant. Nouvelles Recherches sur l'origine des Trematodes. Arch. ital. Biol. 3. pp. 439–453. (An abstract of Dell' adattamento della specie all' ambiente. Mem. Acc. Bologn. 1881–82.)

3. FRAIPONT, J. Nouveaux Vers parasites de l'*Uromastix acanthinurus*. Bull. Ac. Belg. (3) iii. pp. 99–106, 1 pl.

4. GOETTE, A. Abhandlungen zur Entwickelungsgeschichte der Tiere. I. Untersuchungen zur Entwickelungsgeschichte der Würmer. Beschreibender Teil. Leipzig: 1882, 8vo, 104 pp., 6 pls.

5. ——. Zur Entwickelungsgeschichte der marinen Dendrocœlen. Zool. Anz. v. pp. 190–194.

6. GRAFF, L. VON. Monographie der Turbellariden. I. Rhabdocœlida. Leipzig: 1882, fo., 442 pp., and an Atlas of 20 pls.

7. HUBRECHT, A. A. W. Notiz über die während der zwei ersten Fahrten des Willem Barents gesammelten Nemertinen. Niederl. Arch. Zool., Suppl. i. 3, 2 pp., 2 figs.

8. KENNEL, J. VON. Zur Anatomie der Gattung *Prorhynchus*. Arb. Inst. Würzb. vi. pp. 69–90, pl. viii.

9. KIESSLING, F. Ueber den Bau von *Schistocephalus dimorphus*, Creplin, und *Ligula simplicissima*, Rudolphi. Arch. f. Nat. xlviii. pp. 241–280, pls. xiv. & xv.

10. KORSCHELT, E. Ueber den Bau und Entwickelung des *Dinophilus apatris*. Z. wiss. Zool. xxxvii. pp. 315–353, pls. xxi. & xxii., and p. 702. (See also Zool. Anz. v. pp. 398–400.)

11. KRABBE, H. Nye Bidrag til Kundskab om Fuglenes Baendelorme. Dan. Selsk. Skr. (6) i. pp. 349–366, pls. i. & ii.

12. Leuckart, R. Zur Entwickelungsgeschichte des Leberegels (*Distomum hepaticum*). Arch. f. Nat. xlviii. pp. 80–119, pl. viii.

13. ——. Zur Entwickelungsgeschichte des Leberegels. 2e Mittheilung. Zool. Anz. v. pp. 524–528. (See also Arch. Z. expér. x. pp. xxiv.–xxviii.)

14. Linstow, Otto von. Helminthologische Studien. Arch. f. Nat. xlviii. pp. 1–25, pls. i. & ii.

15. Meyer, F. Ein Fall von *Echinococcus multilocularis*. (Inaugural Dissertation.) Gottingen: 1881, 8vo, pp. 36.

16. Penrose, F. G. On a *Cysticercus* from the peritoneal cavity of a Raccoon-like Dog (*Nyctereutes procyonides*). Ann. N. H. (5) x. pp. 1–7, pl. ii.

17. Perroncito, E. I Parassiti dell' uomo e degli animali utili. Bologna, Milano, Napoli: 1882, 8vo, 506 pp., 14 pls.

18. Roboz, Z. v. Beiträge zur Kenntnis der Cestoden. Z. wiss. Zool. xxxvii. pp. 263–285, pls. xvii. & xviii.

19. Sabatier, A. De la Spermatogenèse chez les Annélides. Rev. Sci. Nat. (3) i.

20. ——. De la Spermatogenèse chez les Némertiens. *Op. cit.* ii. pp. 165–179, pls. ii.–iv.

21. Schauinsland, H. Beiträg zur Kenntnis der Embryonalentwickelung der Distomeen. Zool. Anz. v. pp. 494–498.

22. Thomas, A. P. Second Report of Experiments on the Development of the Liver-Fluke (*Fasciola hepatica*). J. R. Agric. Soc. (2) xviii. pp. 439–454. (See also Nature, xxvi. pp. 606–608.)

23. Vejdovsky, F. Thierische Organismen der Brunnen-wässer von Prag. Prag: 1882, 4to, 70 pp., 8 pls.

24. Villot, A. Classification des Cystiques des Ténias. Rev. Sci. Nat. xi. pp. 109–117.

25. ——. L'Appareil vasculaire des Trématodes, considéré sous le double point de vue de la structure et ses functions. Zool. Anz. v. pp. 505–508.

P. Martin Duncan gives a short account of the *Vermes* in Cassell's Natural History, vol. vi. pp. 224–258 (1883. published in 1882).

Anatomy and Development.

The important and elaborate work of Graff (6) has resulted in a new arrangement of the rhabdocœlous Turbellarians; after a detailed account of the anatomy and physiology of the group, there are chapters on œcology and chorology. In the introduction to the classificatory portion, the views of earlier authors are compared, and there is a discussion as to the value of the systematic characters, and some notes on the variability of the species.

A. Lang, J. R. Micr. Soc. 2, ii. p. 340, describes the mode of copulation in marine Turbellarians; there are from nine to fifteen penes, and they appear to thrust themselves indiscriminately into the body of the female; the female organ only serves as an efferent oviducal passage.

Chun (Biol. Centralbl. ii. pp. 5–16), noticing the work of Lang (Zool. Rec. xviii. *Verm.* p. 3), points out the differences in the mode of development of the *Ctenophora* and the marine *Planaria*, and doubts whether the existing resemblances are really signs of genetic affinity.

Kennel (8) does not agree with Schultze in thinking that *Prorhynchus* is a Nemertine, and gives his reasons for regarding it as one of the rhabdocœle *Turbellaria*, detailing the several parts of its organization.

Korschelt (10) thinks that his new species, *Dinophilus apatris*, must be regarded as the type of a new family; though Turbellarian in its general relations, it is distinguished by the indications of segmentation, the arrangement of the cilia, the proctuchous enteron, the position of the proboscis, and the structure of the generative organs. The male is less highly organized and of shorter life than the female.

On the excretory apparatus of Planarians; Vejdovsky, SB. böhm. Ges. 1882, pp. 273–280, 1 pl.

The Recorder has not seen Macé 'Des Trématodes parasites des Grenouilles (see Zool. Anz. v. p. 592); nor Wilson on a new form of *Pilidium* (*l. c.* p. 593).

Sabatier (20) describes the spermatogenesis of Nemertines, and points out the exact and complete parallelism which obtains between them and Annelids, and concludes with some general observations on the significance of the nucleus.

The marine *Cercaria* observed by Fewkes, Am. J. Sci. (3) xxiii. pp. 134 & 135, has a tail which is regarded as being Annelid in character, owing apparently to the presence of bundles of setæ arranged at intervals along its length.

Ercolani (2) disputes the doctrine that each species of mollusk has a single species of cercaria, and instances *Bythinia tentaculata* as having as many as twelve; he finds that while some larvæ have the egg ciliated, and require water, others found in terrestrial mollusks are non-ciliated.

Villot's (25) studies have led him to doubt the presence in Trematodes of a cœlom, or of true segmental organs. The vascular apparatus is described as consisting of a single system of continuous vessels.

The important researches of Leuckart (12, 13) and of Thomas (22) have led to the belief that the history of the Liver-Fluke is now, in its broad outlines, satisfactorily known. There is a considerable body of evidence to support the view that *Limnæus truncatulus* plays an important part as an intermediate host. For a short account of the history of the matter, and of the results attained to, see A. P. Thomas, Nature, xxi. pp. 606–608.

The result of Braun's long-continued investigations (1) is that the [illegible] *Lota vulgaris* are the intermediate hosts of *Bothriocephalus*

[illegible] has discovered in the water-vascular system of *Solenophorus*

megalocephalus the presence of a special musculature for the longitudinal canals and their branches.

Moniez (C. R. xciv. pp. 661–663) gives an account of the uterus of *Tænia pectinata*, and other species. In *T. giardi* the male organs are placed at either end of each joint.

Kiessling (9) discusses the results of Donnadieu, and keeps separate *Ligula* and *Schistocephalus*. The presence of a single ovary in *Ligula* is not to be explained by supposing that there has been a fusion of the two ovaries.

Villot's (24) classification is based on the different modes of the formation of the caudal vesicle; in the first group it arises by simple growth, and in the second by gemmation.

For *Vermes* of Prague see Vejdovsky (3), pp. 50–62; for observations on the *Stenostomidæ*, and their relations to Nemertines and Annelids, pp. 58–60.

Genera and Species.

Graff (6) proposes the following arrangement of the *Turbellaria*. In giving it, the new genera and species are mentioned under their proper heads :—

A. Tribus: *Acœla.*
  I. Fam. *Proporida.*
  II. Fam. *Aphanostomida.*
    (Here, *inter alia*, comes *Cystomorpha*, g. n.)
B. Tribus: *Rhabdocœla.*
  III. Fam. *Macrostomida.*
  IV. Fam. *Microstomida.*
    Microstomum rubro-maculatum, sp. n.
  V. Fam. *Prorhynchida.*
  VI. Fam. *Mesostomida.*
    (*a*) *Promesostomina*, subf. n.
      Promesostoma, g. n.
    (*b*) *Byrsophlebina*, subf. n.
      Byrsophlebes intermedia, sp. n.
    (*c*) *Proxenetina*, subf. n.
      Proxenetes cochlear, gracilis, tuberculatus, rosaceus, [spp. nn.
    (*d*) *Eumesostomina*, subf. n.
      Otomesostoma, g. n.
        O. morgiense, sp. n.
      Mesostoma flavidum, splendidum, neapolitanum [spp. nn.
  VII. Fam. *Proboscida.*
    (*a*) *Pseudorhynchina*, subf. n.
      Pseudorhynchus, g. n.
    (*b*) *Acrorhynchina*, subf. n.
      Acrorhynchus, g. n.
      Macrorhynchus, g. n.
    (*c*) *Hyporhynchina*, subf. n.
      Hyporhynchus, g. n.
        H. coronatus, sp. n.

VIII. Fam. *Vorticida.*
(*a*) *Euvorticina*, subf. n.
Schultzia, g. n.
Provortex, g. n.
Vortex schmidti, millportianus, sexdentatus, semperi,
Jensenia, g. n. [spp. nn.
Derostoma salinarum, sp. n.
(*b*) *Vorticina parasitica*, subf. n.
IX. Fam. *Solenopharyngida*, fam. n.
Solenopharynx, g. n.
S. flavidus, sp. n.
C. Tribus: *Alloiocœla.*
X. Fam. *Plagiostomida*, fam. n.
(*a*) *Acmostomina*, subf. n.
(*b*) *Plagiostomina*, subf. n.
Plagiostoma philippinense, sulphureum, maculatum, bimaculatum, ochroleucum, spp. nn.
(*c*) *Allostomina*, subf. n.
Enterostoma austriacum, cœcum, spp. nn.
Allostoma monotrochum, sp. n.
(*d*) *Cylindrostomina*, subf. n.
Cylindrostoma pleiocelis, sp. n.
XI. Fam. *Monotida.*
Automolus, g. n.

Dinophilus apatris, sp. n., Korschelt (10).

Stylochopsis zebra, sp. n., Verrill, Am. J. Sci (3) xxiv. p. 371, Vineyard Sound.

On the species of Planarians parasitic on *Limulus*, see J. A. Ryder, Am. Nat. xvi. pp. 48–51, and pp. 143, 143; also C. F. Gissler, *l. c.* pp. 52, 53.

Thysanozoon huttoni and *Eurylepta herberti*, spp. nn., near Wellington; J. W. Kirk, Tr. N. Z. Inst. xiv. pp. 267, 268.

Prorhynchus balticus, sp. n., Kennel (8).

Distomum apodis in egg-sac of *Apus lucasanus*; J. A. Ryder, Am. Nat. xvi. p. 142.

Leucochloridium vogtianum, sp. n. (*Succinea baudoni*); Baudon, J. de Conch. xxix. [1881] pp. 145 & 146, pl. v. fig. 5.

Linstow (14) describes as new—

Tænia tenerrima (*Fuligula cristata*), *T. trichosoma* (*Ful. ferina*).

Tænia bacillaris, Goeze, which is figured, = *T. bacillaris*, Diesing, pt.

He figures *Distomum clavigerum*, *D. globiporum*, and *Tænia fringil-arum.*

Krabbe (11) describes as new :—

Tænia friisiana (*Scolopax gallinula*), *T. innominata* ('Pesotschink'), *vicensis* (*Scolopax rusticola*), *T. obvelata* (*Pterocles alchata*), *T.* *s* (*Tringa alpina*), *T. pubescens* (*S. gallinula*), *T. uliginosa* *phœopus*), *T. petrocinclæ* (*Petrocincla cyanea*), *T. vesiculigera* *stica*), *T. polyarthra* (*Cinclus aquaticus*), *T. intricata* (*Upupa* *cirostris* (*Alauda* sp.), *T. orientalis* (*Saxicola œnanthe*), *T.*

præcox (*Ruticella erythrogastra*), *T. dehiscens* (*Cinclus aquaticus*), *T. caprimulgi* (*Caprimulgus* sp.), with notes on some known species.

Tænia alata, sp. n., Fraipont (3).

NEMATOHELMINTHES.

26. Drasche, R. Revision der in der Nematoden-Sammlung des k. k. zoologischen Hofcabinets befindlichen Original Exemplare Diesing's und Molin's. Verh. z.-b. Wien, xxxii. [1883] pp. 117–138, pls. vii.–x.

27. ——. Helminthologische Notizen. *L. c.* pp. 139–142, pl. xii.

28. Joseph, G. Vorläufige Bemerkungen über Musculatur Excretionsorgane und peripherisches Nervensystem von *Ascaris megalocephala* und *lumbricoides*. Zool. Anz. v. pp. 603–609.

29. Örley, L. Report on the Nematodes in the Possession of the British Museum, with a Review of the Classification of the Order. Ann. N. H. (5) ix. pp. 301–318, pl. x.

30. Owen, R. On *Trichina spiralis*. P. Z. S. 1882, pp. 571–575.

31. Schulthess, W. Beiträge zur Anatomie von *Ankylostoma duodenale* (Dubini) = *Dochmius duodenalis* (Leuckart). Z. wiss. Zool. xxxvii. pp 163–220, pls. xi. & xii.

Örley (29) divides the Nematohelminthes into the three suborders of the *Nematentozoa*, *Rhabditiformæ*, and *Anguillulidæ*; the first are parasitic, the second intermediate in structure, and the third free-living; the larvæ of the first perish unless they enter hosts, the second may or may not do so, and the third develop in mould or water.

Mégnin, finding that the anæmia of dogs is apparently due to three species, with the buccal armature of (1) *Dochmius trigonocephalus*, (2) *Ancylostoma duodenale*, and (3) *D. balsami*, thinks that they are all forms of one species, and that the differences in the form of the teeth are probably due to age (Bull. Soc. Z. Fr. vii. pp. 282–289, 1 pl.).

On the influence of low temperature on *Trichina*, see Douley & Gibier, C. R. xciv. pp. 1683–1686.

Schulthess (31) gives a detailed description of *Ancylostoma*, and points out that the genital tract, which is always well developed, is especially so in the female, in a transverse section of which the tube may be cut through as many as ten times.

On the characters of *Peritrachelius*, see Drasche, Verh. z.-b. Wien xxxi. pp. 187–193, pl. xii.

Linstow (14) describes as new:—

Filaria muscicapæ, *F. strigis* (= *Trichina affinis*, Diesing, e. p.), *S*[illegible] *gylus papillatus* (intestine of *Otis tarda*), *S. monodon* (gastric [illegible] *Œdemia nigra*), *Trichosoma talpæ* (bladder of mole), *Agamon* [illegible] *hospes* (*Armadillo vulgaris*, *Vortex lapicida*, *Vitrina cellaria*).

Of old forms, he figures: *Strongylus minutus*, Duj., *S. pa*[illegible]

S. auricularis, Zed.; *Angiostomum entomelas*, Duj., *A. nigro-venosum*, Rud.; *Oxyuris obvelata*, Buons.; *Trichodes crassicauda*; *Rhabditis pellio*.

Drasche (27) describes as new:—

Heteracis amblymoria (*Caprimulgus campestris*), *Ascaris multilobata* (*Dicholophus marcgravi*), *A. multipapillata* (*Tantalus loculator*), *A. pachcia* (*Sarcorhamphus papa*), *A. ovis* (*Ovis aries*).

On *Gordius villoti*, sp. n., and *G. tolosanus*, Duj., see D. Rosa, Atti Acc. Tor. xvii. pp. 333–342, pl. vii.

Filaria candezii, sp. n., Fraipont (3).

Filaria in black bass (*Micropterus nigricans*); Leidy, P. Ac. Philad. 1882, p. 69.

Filaria wymani, sp. n. (cerebellar cavity of *Plotus anhinga*), id. *tom. cit.* p. 109.

Filaria spiralis, sp. n.; *F. ecaudata* for *F. obtusa*, Rudolphi; and *Filaria* sp.: Örley (29).

Filaria evansi, sp. n., from the blood of a camel; T. R. Lewis, P. A. S. B. 1882, pp. 63 & 64.

On *Spiroptera erinacei*, see J. Chatin, Ann. Sci. Nat. (6) xiii. art. 13, 2 pp.

Ascaris spiculigera, sp. n., from 4 birds; Leidy, P. Ac. Philad. 1882, p. 109.

Strongylus douglasi, sp. n.; Cobbold, J. L. S. xvi. pp. 184–188, pl. iv.

"Lung-Worm" in sheep; J. Buchanan, Tr. N. Z. Inst. xiv. pp. 270, 271.

The following papers are known only to the Recorder by the quotation of their titles in Arch. ital. Biol. i. pp. xxix. & xxx.:—

i. Baistrocchi, E. Un caso di *Cysticercus cellulosæ-hominis*. Rivista clinica di Bologna, 1881, pp. 414–418.

ii. Il timolo contro l'*Anchilostoma duodenale*. Gaz. delle cliniche, 1881, pp. 17–19, 129 & 130.

iii. Caporali, V. Echinococco del cervello. Gaz. degli ospitali, 1881, pp. 525–530.

iv. Fiori. Un caso di parassitismo di *Gordius* adulto nell' uomo. R. Ac. di medicina di Torino, 1881, pp. 727–736.

v. Generali, G. Sul *Distoma echinatum* nel cane. Spallanzani, 1881, pp. 614 & 615.

vi. Grassi, B. Di un nuovo parassita dell' uomo *Megastoma entericum* (Grassi). Gaz. degli ospitali, 1881, pp. 577–581.

vii. Grassi, B. Note intorno ad alcuni parassiti del uomo. *Op. cit.* pp. 433–440.

viii. Lanzillotti—Buonsanti. Sulle alterazione che producono gli embrioni di *Filaria immitis* e su una cisti con *Filaria immitis* nel connetivo intermuscolare di un cane. Clinica veterinaria, 1881, pp. 212–215.

ix. Pavesi. Sopra duo Elminti rari dei Rettili. Istit. Lombardo, 1881, pp. 292–298.

x. Perroncito. Sullo sviluppo della cosidetta *Anguillula stercoralis* (Bavay) fuori dell' organismo umano. Archiv. per le scienze mediche, 1881, pp. 24–44.

xi. Perroncito. Gli Anchilostomi ed altri Strongilidi in rapporto collo sviluppo dell' antrace, delle fibori, di malaria, e di altre malattie infettive. R. Ac. med. Torino, 1881.

xii. Piana. Intorno allo sviluppo degli embrioni del cisticerco pisiforme ed alla consecutiva formazione di cellule giganti con schizomicori nel fegato del coniglio. La Veterinaria, 1881, pp. 5–21.

xiii. Piana, G. P. Di una nuova specie di tenia del gallo domestico (*Tænia botrioplitis*) e di un nuova cisticerco delle lumachelle terrestri (*Cysticercus botrioplitis*). Mem. Acc. Bologn. (4) ii. pp. 389–394, 1 pl.

xiv. Rossoni. Contribuzione alla diagnosi ed alla cura degli echinococchi nella cavità abdominale. Roma : 1881.

xv. Parona. L'estratto etero di felce marchio e l'anchilostomiari del minatori del Gottardo. R. Ac. med. Torino, 1881, pp. 72–91.

xvi. Rosa. Nota intorno ad una nuova specie del genere *Gordius* proveniente da Tiflis. Atti Acc. Tor. xvi. (and Lessona on the same, *tom. cit.* pp. 573 & 574).

ACANTHOCEPHALI.

32. Mégnin, P. Récherches sur l'organisation et le développement des Echinorhynques. Bull. Soc. Z. Fr. vii. pp. 326–346, pl. vi.

Mégnin (32) discusses at greater length the results of his studies (Zool. Rec. xviii. *Verm.* p. 7).

Echinorrhynchus uromasticis, sp. n., Fraipont (3).

Linstow (14, p. 17) figures *E. transversus*, Rud., from intestine of *Turdus iliacus*.

ROTATORIA.

33. Gruber, A. Ueber die Baukunst der *Melicerta ringens*. Zool. Anz. v. pp. 80—83.

34. Leidy, J. *Rotifera* without Rotary Organs. P. Ac. Philad. 1882, pp. 243–249.

Floscularia regalis, sp. n. (near Birmingham) ; Hudson, Midl. Nat. v. p. 252 ; see J. R. Micr. Soc. (2) ii. p. 787.

Cupelopagis bucinedax, g. & sp. nn., S. A. Forbes, *tom. cit.* pp. 625 & 626.

Acyclus inquietus, g. & sp. nn., Leidy (34).

Observations on *Stephanocerus eichhorni* ; see J. R. Micr. Soc. (2) ii. p. 345.

Desiccation of Rotifers ; *l. c.* pp. 787 & 788.

Eyes of Rotifers ; J. Badcock, *l. c.* p. 512.

GEPHYREA.

35. Caldwell, W. H. Preliminary Note on the Structure, Development, and Affinities of *Phoronis*. P. R. S. xxxiv. pp. 371–383.

36. Foettinger, A. Note sur la formation du mésoderme dans la larve du *Phoronis hippocrepia*. Arch. Biol. iii. pp. 679–688, pl. xxxi.

37. Horst, R. Die *Gephyrea*. iie Hälfte : *Priapulida* and *Sipunculida* [from 'Willem Barents' Expedition]. Niederl. Arch. Zool. Suppl. i. 3, pp. 13–40.

38. Rietsch, M. Études sur le *Sternaspis scutata*. Ann. Sci. Nat. (6) xiii. Art. No. 5, 84 pp., pls. xviii.–xxiii.

39. Sluiter, C. Ph. Notiz über die Segmental-organe und Geschlechtsdrüsen einiger tropischen Sipunculiden. Tijdschr. Nederl. Dierk. Ver. vi. pp. 1–20, pl. i.

40. Vejdovsky, F. Bemerkungen zur neueren und älteren Literatur über *Sternaspis scutata*. SB. böhm. Ges. 1882, pp. 438–450, 1 pl.

For the earliest stages in the development of *Phoronis*, see Fœttinger (36), where especial attention is directed to the early appearance of the mesoblast.

Caldwell (35) has published the abstract of what promises to be a very important paper on *Phoronis*, including such generalizations as that the body-cavity is an enterocœle, and that other Trochosphores are probably also so, and that the Platyhelminths are degenerate enterocœles. After an account of some adult characters, such as the division of the body-cavity into three chambers, the arrangement of the nephridial tube which opens into the posterior chamber, and the presence of a closed system of vessels containing red blood-corpuscles, the author gives a summary of the developmental history, describing the unequal segmentation, the development of an invaginate gastrula, and the formation of the blood-vessels as splits in the splanchnopleure. The fully formed free-swimming larva is described, and the relations of *Phoronis* to the *Brachiopoda* and *Polyzoa* briefly discussed.

In his account of *Priapulus bicaudatus*, Horst (37) discusses some of the results of Koren & Danielssen, and describes the connection, throughout the whole of its length, of the nervous system with the ectoderm. The male organs, hitherto undescribed, have the same form and position as the female, but are racemose and not lamellar in structure.

Rietsch (38) is convinced of the Annulate character of *Sternaspis*.

Horst (37) describes as new *Stephanostoma barentsi*.

Sluiter (39) describes as new:—

Aspidosiphon fuscus.

Phascolosoma nitritorquatus, falcidentatus, prioki.

On Bonellein and its derivates, see C. F. W. Krukenberg, Vergl. physiol. Stud. Adria (Heidelberg : 1882) ser. ii. Abth. 2, pp. 70–80.

CHÆTOGNATHI.

...itta falcidens, sp. n., Atlantic City, N. J., Leidy, P. Ac. Philad. ...02; Ann. N. H. (5) x. pp. 79 & 80.

...G. B. Intorno ai Chetognathi. Rend. Ist. Lomb. xiv. ...3.

ANNULATA.

41. Czerniavsky, V. Materialia ad Zoographiam Ponticam comparatam. (Continuatio.) Bull. Mosc. lvii. pp. 146-198.

42. Giard, A. Sur un type synthétique d'Annélide (*Anoplonereis herrmanni*), commensal des *Balanoglossus*. C. R. xcv. pp. 389-391 ; Ann. N. H. (5) x. pp. 330-332.

43. Greef, R. Ueber die rosettenförmigen Leuchtorgane der Tomopteriden und zwei neue Arten von *Tomopteris*. Zool. Anz. v. pp. 384-387.

44. Hansen, G. A. Den Norske Nordhavs-Expedition 1876-78. vii. *Annelida*. Christiania : 1882, fol. 54 pp., 7 pls. and 1 map.
[Norwegian and English in parallel columns.]

44a. ——. Recherches sur les Annélides recueillies par M. le Prof. E. van Beneden pendant son voyage au Bresil et à la Plata. Mém. cour. Ac. Belg. 4to, xliv. 29 pp. 7 pls.

45. Haswell, W. A. On the Segmental Organs of *Polynoë*. Zool. Anz. v. pp. 540-545.

46. ——. On the Structure and Functions of the Elytra of the Aphroditacean Annelids. Ann. N. H. (5) x. pp. 238-242.

47. ——. A Monograph of the Australian *Aphroditea*. P. Linn. Soc. N. S. W. vii. pp. 250-298, pls. vi-xi.

48. Jijima, J. The Structure of the Ovary and the Origin of the Eggs and the Egg-strings in *Nephelis*. Zool. Anz. v. pp. 12-14. (See also Q. J. Micr. Sci. xxii. pp. 189-211, pls. xvi.-xix.)

49. Kennel, J. Ueber *Ctenodrilus pardalis*, Clap. Ein Beitrag zur Kenntniss der Anatomie und Knospung der Anneliden. Arb. Inst. Würzb. v. pp. 373-427, pl. xvi.

50. Kleinenberg, N. Sull' origine del sistema nervoso centrale degli Annelidi. Atti Acc. Rom. Mem. x. [1881], pp. 421-430. [See Ann. N. H. (5) ix. p. 67, and Biol. Centralbl. ii. pp. 231-236.]

51. Langerhans, P. Ueber einige canarische Anneliden. Nova Acta Halle, xlii. pp. 95-124, pls. iv. & v.

52. Macé (E.). De la Structure du tube des Sabelles. Arch. Z. expér. x. (notes) pp. ix.-xiv.

53. Metschnikoff, E. Vergleichend-embryologische Studien. (3) Ueber die Gastrula einiger Metazoen. Z. wiss. Zool. xxxvii. pp. 286-313, pls. xix. & xx.

54. Meyer, E. Zur Anatomie und Histologie von *Polyophthal*[illegible] *pictus*, Clap. Arch. mikr. Anat. xxi. pp. 769-823, pls. xx[illegible] xxxiii.

55. Powell, T. Remarks on the Structure and Habits of [illegible] reef Annelid, *Palolo viridis*. J. L. S. xvii. pp. 393-396.

56. Salensky, W. Études sur le développement des Annélides. Arch. Biol. iii. pp. 345–378, pls. xiv. & xv., and pp. 561–604, pls. xxiii.–xxv. [See also Biol. Centralbl. ii. pp. 198–208.]

57. Steen, J. Anatomisch-histologische Untersuchung von *Terebellides stroemii*, M. Sars. Jen. Z. Nat. xvi. pp. 201–246, pls. xi.–xiii.

58. Verrill, A. E. New England *Annelida*. Part 1. Historical sketch, with annotated lists of the species hitherto recorded. Tr. Conn. Ac. iv. pp. 285–324, pls. iii.–xii.

59. Whitman, C. O. A new Species of *Branchiobdella* (*B. pentadonta*). Zool. Anz. v. pp. 636 & 637.

The Recorder has not been able to see the essay of Larbalétrier on the earthworm, of Kœhler on *Nephelis*, or Nasse on the *Tubificidæ* (cf. Zool. Anz. v. pp. 594 & 595).

Anatomy and Development.

Die Gerüstsubstanzen der Würmer; C. F. W. Krukenberg. Vergl. physiol. Stud. Adria (Heidelberg: 1882) ser. ii. Abth. 2, pp. 70–80.

On the chemical composition of the tubes of *Onuphis tubicola*; see O. Schmiedeberg, MT. z. Stat. Neap. iii. pp. 373–392.

Macé (52) has closely studied the mode of formation of the tube of *Sabella penicillus*, and distinguishes an external portion not formed by the animal from an internal part, which is constant and essential, and appears to be formed by special glands.

Haswell (46) regards the elytra as having very varied functions, such as protective, phosphorescent, sensory, respiratory, and marsupial, and points out the structural characters which support his views.

Greef (43) regards the rosette-shaped "eyes," or glands, as phosphorescent organs; the tubes of the rosettes are filled with granular matter, and provided with nerves.

Salensky (56) has especially observed the development of *Terebella* sp., *Nereis cultrifera*, and *Spio fuliginosus*. After an account of the earlier stages, he points out the existence of a cavity with contractile walls, exhibiting regular pulsations, from which the enteric vessels are derived, and that this is an arrangement which is permanent in some lower Annelids. The history of *Branchiobdella* is also detailed.

Kleinenberg (50) finds a nerve-ring in polychætous larvæ, which he compares with that of the *Medusæ*, and comes to the conclusion that in larval Annelids we have the old nervous system of the *Cœlenterata*, which is replaced in the adult by a "new formation." [It may be here conveniently noted that Gason & Gadow (J. Anat. Phys. 1882, p. 621) translate "neubildung" by "neomorphism."] The author points out the importance of neomorphisms as affecting the rearrangement of the parts in an organism.

Bergendal (49) finds that *Ctenodrilus* is an ancient and "collective" type, [illegible]nities to both *Oligochæta* and *Polychæta*, while the forward [illegible]f the segmental organs demonstrates that it is not a degraded [illegible]*odrilus* and *Parthenope* may be united in the family *Ctenodrilidæ*,

which will consist of marine Annelids, of few segments, a non-closed vascular system, a single pair of segmental organs in the head, and reproducing by gemmation (sexual reproduction unknown). The author, like Langerhans (51), makes contributions to our knowledge of the phenomena of gemmation.

Eisen (N. Act. Ups. xi. [1881] : *cf.* Zool. Rec. xviii. *Verm.* p. 12) has an important essay on the *Eclipidrilidæ*, based on a study of *Eclipidrilus frigidus*, sp. n., found in the heights of the Sierra Nevada, California ; in which especial attention is directed to the characters of the generative organs, and the total absence of efferent funnels.

On the blood and lymph of *Arenicola piscatorum*, see C. F. W. Krukenberg, Verg. physiol. Stud. 1882 ; see ii. Abth. 2, pp. 87–89.

Powell (55) doubts the truth of the doctrine that *Palolo* breaks up in order to effect the liberation of the ova.

A. T. Urquhart thinks that Hensen has underrated the numbers of earthworms per acre ; Earthworms in New Zealand, N. Z. J. Sci. i. pp. 243 & 244.

On the segmental organs of *Clepsine* and *Nephelis* ; see F. Vejdovsky, SB. böhm. Ges. 1882, pp. 410–413.

On the muscular tissue of the Leech ; see Shore, Nature, xxvi. pp. 493 & 494.

On the central duct of the nephridium of the Leech ; see A. G. Bourne, Q. J. M. S. xxii. pp. 337 & 338.

Artificial culture of Medicinal Leeches ; Bull. U. S. Fish. Comm. 1881, i. p. 264.

Genera and Species.

List of the *Annelida* of the Færöe Channel ; W. C. M'Intosh, P. R. Soc. Edinb. xi. pp. 393 & 394.

Langerhans (51) enumerates 57 species, of which the following are new :—

Typosyllis pulvinata, sp. n.
Ehlersia ferruginea, sp. n.
Grubea arminii, sp. n.
Ancistrosyllis albini, sp. n.
Linophorus canariensis, sp. n.
Perinereis taorica, sp. n.
Marphysa saxicola, sp. n.
Arabella hilairii, Delle Chiaje, var. n.
Branchiomaldane vincenti, g. & sp. nn.
Amphitrite orotavæ, sp. n.

36 of the species have been found at Madeira, and of these 2 are almost cosmopolitan, and 2 West Indian, 22 are European ; of the other 12, 11 are European, and 1 Southern.

Langerhans (51, pp. 101 & 102) has some observations on Gru... *Annulata semperiana*, and thinks that—

Syllis uncinigera and *S. singulisetis* belong to the subgenus *Ha...* *S. violacea-flava* = *Haplosyllis hamata*, Clap. Perhaps *S. lychoc...* *Haplosyllis*.

S. flaccida = *S. amica*, Quatrf. ; *S. cerina* is a young *Ehlersia cornuta*. *S. umbricolor* = *S. gracilis*, *S. erythropsis* = *S. aurantiaca*, and *S. nigrescens* = *S. nigricirris*, Grube.
Odontosyllis arenicolor = *O. ctenostoma*.

Hansen (44) describes as new :—
Polynoe aspera, islandica, arctica, assimilis, spinulosa, foraminifera, glaberrima.
Phyllodoce arctica.
Nephthys atlantica.
Typhlonereis gracilis, g. & sp. nn.
Onuphis hyperborea.
Scalibregma (?) *abyssorum, parvum.*
Ammotrypane cylindricaudatus.
Sphærodorum abyssorum.
Trophonia hirsuta, borealis, rugosa, arctica.
Brada granulosa.
Cirratulus abyssorum, C. (?) *abranchiatus.*
Clymene koreni.
Myriochele sarsi, danielsseni.
Potamilla malmgreni.
Protula arctica.
Spinther arcticus.

In the accompanying lists the known forms found are mentioned, and it was seen that but few families of Annelids are not represented in the frigid area, while most of them are to be found also in parts of the temperate area.

Hansen (44A) describes as new :—
Eurythoe brasiliensis.
Psammolyce kinbergi.
Macrophyllum benedeni.
Hesione margaritæ.
Syllis brevicirris.
Eunice parva.
Nauphanta brasiliensis.
Nicidiva incerta.
Nausicaa minima.
Arabella dubia.
Diopatra brasiliensis, variegata.
Onuphis tenuis.
Nereis gracilis, lata, cærulea, glasioci, minor, aculeata, microphthalma, macrocephala, ferox, scolopendroides.
Phyllonereis (g. n.) *benedeni.*
Ophelina brasiliensis, kinbergi.
Cirratulus danielsseni.
...ra edentata, incerta.
... formosa, armata.
...lares brasiliensis.
...llis.

Terebellides koreni.
Spirographis nobilis, simplex, gracilis, imperialis.

Grube, SB. nat. Fr. 1881, pp. 109–117, describes as new :—
Nereis larentukana.
Eunice januarii.
Nephthys laciniosa.
Sabella rufovittata.
Serpula (*Pomatoceros*) *tricornis, luzonica.*

Haswell describes as new :—
Aphroditea terræ-reginæ.
Hermione brachyceras, macleari, dolichoceras.
Triceratia, g. n. Near *Hermione*, but with three tentacles on the præstomium, and without barbed setæ ; for *T. arœoceras.*
Lepidonotus melanogrammus, lissolepis, simplicipes, œololepis, torresiensis, dictyolepis.
Antinoe præclara, ascidiicola.
Polynoe asterolepis, ochthœbolepis.
Thalanessa microceras.

For Annelids collected during surface dredging at Vineyard Sound and descriptions of some of the species, see Verrill, Am. J. Sci. (3) xxiv. pp. 367–371. The following appear to be new :—
Autolytus mirabilis.
Tetraglene agilis.
Eusyllis tenera.
Syllides setosa.
Grubea websteri.
Acrocirrus leidii.

Czerniavsky (41) gives a comparative table of the 18 genera included in the *Phyllodocea*, and forms as new subgenera of *Mystides*, *Mesomystides* (for *M. cæca*, Langerhans), and *Protomystides* for *M. bidentata*, Lang.
Eulalides, g. n. "Segmentum buccale unicum, cirros tentaculares omnes gerens. Oculi 2."
Mesoeulalia, *Paraeulalia*, gg. nn., distinguished from *Eulalia* (Sav.) s. str.
Eteone picta, Qfgs. : two forms distinguished.
In *Carobia*, 3 subgenera, *Protocarobia*, n., *Carobia*, s. str., and *Paracarobia*. *C. lanceoligera*, sp. n. *Phyllodoce tuberculata* is a *Carobia* : 4 varieties distinguished.
Anaitides, g. n. "Segmentum buccale duplex. Cirri tentaculares paria 4 : 1-mum par sub capite. 2-dum et 3-ium in segmento primo, 4-tum in segmento 2-do affinum. Oculi 2, cetera ut in præcedente [*Phyllodoce*].
Phyllodoce laminosa, Sav., = *Genetyllis laminosa.*
Eracia (*Eulalia*) *virens*, var. n. *pontica*, with two forms.
Eulalia pallida, forma *suchumica* described.
Pterocirrus (*Eulalia*) *macroceros* ; var. n. *pontica.*

The family *Hesionea* are next dealt with, and a comparative table given of its 22 genera.

Parapodarke, g. n. Intermediate between *Podarce* and *Microphthalmus*; for *P. lubrica*, sp. n.

Aphroditacea: *Paranychia*, g. n. for *P. taurica*, sp. n.

Eunoa mammiloba, *truncata*, spp. nn.

Lagisca ehlersi, var. n. *pontica*.

Parapolynoe, g. n. for *sevastopolica*, sp. n.

Pholoe synophthalmica, var. n. *pontica*.

Nephthys: comparative table of 5 Mediterranean species:—*N. mœotica* and *N. langerhansi*, spp. nn.

Tomopteris rolasi, *mariana*, spp. nn., Greef (43).

Distichopus, g. n. *Euchytræidorum*, for *D. silvestris*, sp. n. (Pennsylvania); Leidy, P. Ac. Philad. 1882, pp. 145–147.

ENTEROPNEUSTI.

Balanoglossus aurantiacus in moderate numbers near Atlantic City, N. J.; Leidy, P. Ac. Philad. 1882, p. 93; Ann. N. H. (5) x. p. 79.

MESOZOA.

60. Beneden, E. van. Contribution à l'histoire des Dicyémides. Arch. Biol. iii. pp. 195–228, pls. vii. & viii.

61. Julin, C. Contribution à l'histoire des Mésozoaires; Recherches sur l'organisation et le développement embryonnaire des Orthonectides. Arch. Biol. iii. pp. 1–54, pls. i.–iii.

62. Whitman, C. O. A Contribution to the Embryology, Life-History, and Classification of the Dicyemids. MT. z. Stat. Neap. iv. pp. 1–89, pls. i.–v.

The important papers published in this group have, perhaps, a little had their origin in the view lately expressed by Leuckart (12), that we have here to do with forms degenerated by parasitism, and comparable to the ciliated larvæ of *Distomata*. This view is especially discussed by Van Beneden (60) who rejects it entirely. The author just named describes 2 new genera: *Conocyema*—*C. polymorpha*, from the renal cavity of *Sepia officinalis*; and *Microcyema*—*M. vespa*, which was taken by Wagener for the infusoriform embryo of *Dicyema gracile*. Van Beneden now inclines to the view that the infusoriform form is a male, and its "urne" a testicle. He concludes by justifying the establishment of the phylum of *Mesozoa*, which he defines and divides into *Orthonectida* and *Rhombozoa*: the latter are divisible into *Dicyemida* and *Heterocyemida*.

Julin's (61) general results are in close accordance with those of his master, and he also defends the group *Mesozoa*. He points out how they resemble or how they differ from the *Actinozoa*, and gives some details

as to their infection of *Ophiurids*, and the characters of the different forms.

Whitman (32) subjects the statements of Van Beneden to a searching criticism, and thinks that only 2 genera are to be distinguished as yet in the *Dicyemidæ—Dicyema*, and *Dicyemmenea*. He thinks that Julin has really proved the existence of a mesoderm, and he believes that the group is one which has been degraded by the parasitic habit; whether they are derived from such a form as *Dinophilus* or from the *Trematoda*, further investigations must decide. Nematogenic individuals are found in young, and rhombogenic in old Cephalopods; so that the parasite appears to differ with the age of its host.

ECHINODERMATA.

BY

F. Jeffrey Bell, M.A., Sec. R.M.S., F.Z.S.

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1. Agassiz, A. Bibliography to accompany "Selections from Embryological Monographs," compiled by A. Agassiz, W. Fewkes, & E. L. Mark. II. *Echinodermata*. Bull. Mus. C. Z. x. No. 2.

2. Apostolidès, N. C. Anatomie et Développement des Ophiures. Arch. Z. expér. x. pp. 121–224, pls. i.–xii.

3. Bell, F. J. Descriptions of new or rare species of *Asteroidea* in the Collection of the British Museum. P. Z. S. 1881, pp. 121–124, pl. vi.

4. ——. Note on *Asterias glacialis* and the species allied thereto. Zool. Anz. v. pp. 282–284 (Arch. Z. expér. x. pp. lix. & lx.).

5. ——. Note on the species of the Linnean Genus *Asterias* which are ascribed to Retzius. Ann. N. H. (5) ix. pp. 166–168.

6. ——. An Attempt to apply a Method of Formulation to the Species of the *Comatulidæ*; with the description of a new species. P. Z. S. 1882, pp. 530–536, pl. xxxv.

7. ——. Note on a Crinoid from the Straits of Magellan. *Tom. cit.* pp. 650–652.

8. ——. Studies in the *Holothuroidea*. I. On the Genus *Psolus* and the forms allied thereto. *Tom. cit.* pp. 641–650, pl. xlviii.

9. ——. Note on the Spicules found in the Ambulacral Tubes of the regular *Echinoidea*. J. R. Micr. Soc. (2) ii. pp. 297–299, pl. v.

10. ——. Note on the Echinoderm-Fauna of the Island of Ceylon, together with some Observations on Heteractinism. Ann. N. H. (5) x. pp. 218–225.

11. Carpenter, P. H. Notes on Echinoderm Morphology. No. v. On the Homologies of the Apical System, with some Remarks upon the Blood-vessels. Q. J. Micr. Sci. xxii. pp. 371–386.

12. [Carpenter, P. H.] The Stalked Crinoids of the Caribbean Sea (Reports on the Results of Dredging, under the supervision of Alexander Agassiz, in the Gulf of Mexico and in the Caribbean Sea, by the U. S. Coast Survey Steamer). Bull. Mus. C. Z. x. pp. 165–181.

13. ——. Descriptions of new or little known *Comatulæ*. I. On the Species of *Atelecrinus* and *Eudiocrinus*. II. The *Comatulæ* of the Hamburg Museum. J. L. S. xvi. pp. 487–526.

14. ——. On the Classification of the *Comatulæ*. P. Z. S. 1882, pp. 731–747.

15. Danielssen, D. C., & Koren, J. Den Norske Nordhavs-Expedition 1876–78. VI. *Holothuroidea*. Christiania : 1882, large 4to, 95 pp., 13 pls. and 1 map (Norwegian and English in parallel columns).

16. —— ——. Fra den norske Nordhavsexpedition. Echinoderme. N. Mag. Naturv. xxvii. pp. 267–299, 4 pls.

[The remarks on *Solaster* translated in Ann. N. H. (5) x. pp. 436–443.]

17. Duncan, P. M. On some points in the Morphology of the Test of the *Temnopleuridæ*. J. L. S. xvi. pp. 343–358, pl. viii.

18. ——. On the genus *Pleurechinus*, L. Agassiz ; its classificatory position and alliances. *Tom. cit.* pp. 447–454.

19. Geddes, P., & Beddard, F. E. On the Histology of the *Pedicellariæ* and of the Muscles of *Echinus sphæra* (Forbes). Tr. R. Soc. Edinb. xxx. pt. i. pp. 383–398, pls. xxix.–xxi. [Arch. Z. expér. x. pp. xvii.–xx.].

20. Greef, R. Echinodermen, beobachtet auf einer Reise nach der Guinea-Insel São Thomé. Zool. Anz. v. pp. 114–120, 135–139, 156–159.

21. Hoffmann, C. K. Die Echinodermen gesammelt während der Fahrten des 'Willem Barents' (1878–79). Niederl. Arch. Zool. Suppl. Bd. i. 3, Art. 2, 20 pp., 1 pl.

22. Jourdain, S. Sur les voies par lesquelles le liquide séminal et les œufs sont évacués chez l'Astérie commune. C. R. xciv. pp. 744–746.

23. Jourdan, E. Sur quelques points de l'anatomie des Holothuries. C. R. xciv. pp. 1206–1208.

24. ——. Sur les organes sexuels mâles et les organes de Cuvier des Holothuries. C. R. xcv. pp. 252–254.

24a. ——. Sur la structure histologique du tube digestif de l'*Holothuria tubulosa*. C. R. xcv. pp. 565 & 566 [Ann. N. H. (5) x. pp. 415 & 416].

25. Koehler, R. Sur quelques essais d'hybridation entre diverses espèces d'Echinoidées. C. R. xciv. pp. 1203–1205 [Ann. N. H. (5) x. pp. 179 & 180].

26. ——. Recherches sur l'anatomie de quelques Echinides. *Tom. cit.* pp. 1260–1262.

27. [Koehler, R.] Recherches sur l'appareil circulatoire des Oursins reguliers. C. R. xcv. pp. 459–461 [Ann. N. H. (5) x. pp. 408–410].

28. Ludwig, H. Entwickelungsgeschichte der *Asterina gibbosa*, Forbes. Z. wiss. Zool. xxxvii. pp. 1–98, pls. i.–viii.

29. ——. Verzeichniss der von Prof. E. van Beneden an der Küste von Brasilien gesammelten Echinodermen. Mem. cour. Ac. Belg. xliv. 4to, 26 pp.

30. ——. List of the Holothurians in the Collection of the Leyden Museum. Notes Leyd. Mus. iv. pp. 127–137.

31. Lyman, T. Reports on the *Ophiuroidea* dredged by H.M.S. 'Challenger' during the years 1873–76. Challenger Reports, Zool. v. 386 pp., pls. i.–xlviii.

32. Marenzeller, E. v. Neue Holothurien von Japan und China. Verh. z-b. Wien, xxxi. pp. 121–140, pls. iv. & v.

33. Perrier, E., & Poirier, J. Sur l'appareil circulatoire des Étoiles de mer. C. R. xciv. pp. 658–661.

34. —— ——. Sur l'appareil reproducteur des Étoiles de mer. *Tom. cit.* pp. 891 & 892.

35. Perrier, E. Note sur les *Brisinga*. C. R. xcv. pp. 61–63 [Ann. N. H. (5) x. pp. 261–263].

36. ——. Sur une Astérie des grandes profondeurs de l'Atlantique, pourvue d'un pédoncule dorsal. *Tom. cit.* pp. 1379–1381.

37. Sladen, W. P. The *Asteroidea* of H.M.S. 'Challenger' Expedition (Preliminary Notices). 1. *Pterasteridæ*. J. L. S. xvi. pp. 189–246.

38. Théel, H. Report on the *Holothuroidea* dredged by H.M.S. 'Challenger' during the years 1873–76. Part i. Challenger Reports, Zool. iv. 176 pp., pls. i.–xlvi.

On the colouring matters of Echinoderms consult C. F. W. Krukenberg's "Vergleichend Physiologische Studien" (Heidelberg: 1882), Ser. 2, Abth. i. p. 148 (Albinism in *Cucumaria planci*), p. 179 (*Holothuria poli*, &c.); on asterocyanin, see Abth. iii. p. 70, and on the colouring matter of *Antedon rosaceus*, p. 88.

"Die Schutzdecken der Echinodermen," *op. cit.* Abth. i. pp. 35–48.

On the Perivisceral Fluid of the Sea-Urchin and its coagulation, see E. A. Schäfer, P. R. S. xxxiv. pp. 370 & 371.

For a good popular account of the *Echinodermata*, see P. H. Carpenter in Cassell's Natural History, vol. vi. (1883, published in 1882), pp. 259–276.

General Morphology of the Group.

Carpenter (11) continues his discussions of the morphological results of various inquirers, and expresses doubts as to whether, after all, the central

plexus of the *Echinozoa* may not be glandular in nature; he regards as well established the existence of radial blood-vessels in Ophiurids. He thinks that Ludwig has demonstrated the existence in *Amphiura* of the representatives of the under-basals of Crinoids, and that the dorsal side corresponds to the dorsal, and not, as Ludwig thinks, to the ventral side of a Crinoid.

Ludwig (28) has some very important observations on development, which he thinks must be looked upon as metamorphic in character, though he is far from supporting the well-known theories of Hæckel. He regards the various forms of larvæ as being secondary, and modified. Intermediate larval stages may be interpolated, but do not affect the essential characters of development, being adaptations proper to the larval life, and disappearing with its cessation. The dorsal pore in the embryo appears to have primitively led into the enterocœl, and its connection with the hydrocœl, therefrom developed, is only a secondary phenomenon; the earlier relation is retained by the *Crinoidea*. Attention is directed to the "larval organs," and a study of the development of the skeleton results in demonstrating its resemblance to what obtains in the *Ophiuroidea*. No definite plane of symmetry is to be detected in the adult, and if any interradius can be spoken of as the "anterior" one, it is that in which we find the remnant of the larval organ and the anus; when these are lost it may still be recognized by having, in a dorsal view, the madreporite to the left of it. The ambulacral plates of Echinoids are regarded as the homologues of the adambulacral plates of the Asterid and the lateral plates of the arms of the Ophiurid. The so-called odontophore is now (in opposition to an earlier view) regarded as an unpaired interambulacral plate.

Perrier (36) regards *Caulaster* as an Asterid of especial significance, as it is provided with a dorsal peduncle, which he looks upon as indicating its relations to the stalked forms; the nearest ally among known genera is thought to be *Ctenodiscus*, which has a slight dorsal tubercle.

Perrier (35) has examined sixteen discs and other remnants of a species of *Brisinga*, of which a new species, *B. edwarsii*, has been dredged in the Atlantic; he regards *B. coronata* and *B. endecacnemos* as two forms of the same species, and he points out that the dorsal skeleton is not developed in young forms, and in the adult is only found where the genital glands are developed. The form appears to indicate some close relation between the *Asteroidea* and the *Ophiuroidea*, while the early arrangement of the plates of the disc recalls the constitution of a Crinoid.

Apostolidès (2) has made an elaborate investigation into the structure of the *Ophiuroidea*, devoting himself largely to the study of living specimens, and he reports on the development of *Ophiothrix versicolor* and *Amphiura squamata*.

Koehler (25) finds that cross fertilization is possible, within very wide limits, among the species of the *Echinoidea*, but while the ova of one species may be fertilized by the spermatozoa of another, the reverse may not hold good. Regular breed better with other regular than with irregular Echinoids.

Perrier & Poirier (33) are at issue with Ludwig with regard to the characters of the "heart" and other parts of the vascular system, and they regard the former as merely a simple gland.

Jourdain (22) describes five ducts as forming the genital passages of *Asterias*, and thinks that, as in Holothurians, the products escape to the exterior by a pore in the circum-oral circlet, and not by interradial perforated plates. Perrier & Poirier (34) find, however, in *A. glacialis* groups of small holes which are set a little above each interradial angle; the circular dorsal canal has nothing to do with the generative system.

Koehler (26) regards the Polian vesicle of regular Echinoids as an excretory organ; and comes to the conclusion that the internal organs of the irregular have been, as compared with those of the regular Echinoids, profoundly modified.

Danielssen & Koren (15) describe the madreporite of *Trochostoma* as being placed on, but not at the extremity of the sand-canal, while in *Kolga* the canal retains the embryonic character of being open in the adult.

Bell (10) takes *Ophiomastix annulosa* as a text for some observations on heteractinism, and objects to the use of term "voluntary" as applied to fission. He thinks that the origin of the habit of self-mutilation is to be found in the imperative necessity of reproducing the species, and was first used as the means for evacuating the genital products; now it is true asexual reproduction. He gives the following table of the means of reproduction :—

A. Sexual reproduction.
  a. With metamorphosis.
  b. Without metamorphosis (viviparous forms).
B. Asexual reproduction.
  a. Fission, with repair.
  b. External gemmation from a single arm.

Bell (7) thinks that the presence of a variety of *Antedon eschrichti* in the Antarctic Regions brings forcibly forward the question of the so-called monophyletic or polyphyletic origin of species.

Distribution, &c.

Echinoderms of the Arctic Seas; Hoffmann (21), Danielssen & Koren (16).

Holothuroidea of the Arctic Seas; Danielssen & Koren (15).

Echinoderm fauna of South Coast of New England; Verrill, Am. J. Sci. (3) xxiii. pp. 138–142, xxiv. pp. 362. And *id.* for Arctic Echinoderms, *op. cit.* xxiii. pp. 247 & 248.

Echinodermata of Farõe Chaunel: *Holothuroidea* by H. Théel, P. R. S. Edin. xi. pp. 694–697; *Echinoidea* by A. Agassiz, pp. 697 & 698; *Asteroidea* by W. P. Sladen, pp. 698–707; *Ophiuroidea*, by T. Lyman, p. 707.

Crinoids of the Caribbean Sea; Carpenter (12).

Echinoderms of the Eastern Atlantic; Greef (20).

Echinoderms off the Coast of Brazil; Ludwig (29).

Echinoderms of Ceylon; Bell (10).

Holothurians from Chinese and Japanese Seas; Marenzeller (32).

Echinoids of South Australia; R. Tate, Tr. R. Soc. S. Austr. v. pp. 74 & 75.

ECHINOIDEA.

Bell (9) finds that the bihamate spicules are found in the so-called *Echinometridæ* as well as in the *Echinidæ*, and regards this as a further reason for uniting those families. He describes the spicules of *Echinocidaris*, which had not been detected by Stewart, and suggests that their rarity is due to the great thickness of the walls of their suckers. The irregular, or "amorphous" spicules of *Salenia* may perhaps afford a type from which the more elaborate spicules of the *Ectobranchiata* may be derived.

Duncan (17) describes the grooves and depressions, or pits, in the *Temnopleuridæ*, and finds that the last are continued into the test as flask-shaped cavities; the amount of undermining is considerable. The pits increase the superficies of the derm, and near the peristome contain sphœridia. The *Temnopleuridæ* may be separated into two divisions—one with and one without pores; the latter are the oldest in time.

Duncan (18) regards *Pleurechinus* as a subgenus of *Temnopleurus*.

On *Spatangus purpureus*, see Koehler, C. R. xciv. pp. 139–141.

On the development of *Arbacia punctulata*, see Zool. Anz. v. p. 341.

Echinus alexandri, sp. n., Danielssen & Koren (16).

Stomopneustes atropurpurea, sp. n. [see Zool. Rec. xvii. *Ech.* p. 6].

Hipponoe variegata, var. n. *alba*, J. E. T. Woods, P. Linn. Soc. N. S. W. vii. pp. 93 & 94, figs.

In his notes on new or rare (fossil*) Echinids Cotteau deals particularly with the genus *Micropsis*; Bull. Soc. Z. Fr. vii. pp. 406–424.

Cleistechinus, g. n. Described by Loriol (Mém. Soc. Genèv. xxviii.) among the 'Echinides des environs de Camerino Toscane,' apparently most nearly allied to *Argopatagus* (Miocene).

Enichaster, g. n., *id. ibid.*; one of the *Holasteridæ* (Oligocene).

On fossil *Echinoidea* from the Nummulitic Strata of West Sind, see Duncan & Sladen, Mem. Geol. Surv. Ind. ser. xiv. vol. i. 3, fasc. i & ii., where the following new genera are described:—*Acanthechinus*, *Dictyopleurus*, *Arachnopleurus*, *Progonechinus*, *Plesiolampas*, *Eolampas*, *Paralampas*, and *Neocatopygus*.

Cotteau writes on jurassic *Salenidæ* in Bull. Soc. Géol. Fr. (3) viii. pp. 297–299; on jurassic *Hemicidaris*, op. cit. x. pp. 48–52; and on jurassic *Pseudodiadema*, op. cit. xi. pp. 8–13; he gives (*op. cit.* x. pp. 341–346) an account of Algerian Echinids, and (*tom. cit.* pp. 264 & 265) of the Echinids of Cuba; the two last papers dealing with the subject matter of more extended works.

On the jurassic Echinids "du Boulonnais," see E. Rigaux, *op. cit.* viii. pp. 620–633.

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* The Recorder does not pretend to any completeness in his notices of fossil forms, but he attempts to indicate the papers which seem to be most important.

ASTEROIDEA.

For a discussion of the characters of *Asterias africana*, see Greef, (20) p. 117; and for an account of the variability of *A. glacialis*, Bell, (4) p. 282.

For an account of the terminology used in the description of the *Pterasteridæ*, see Sladen, (37) pp. 191 & 192.

Danielssen & Koren (16) discuss the proposals to form genera of *Solaster*, *Crossaster*, and *Lophaster*, and propose to unite them all under the name of *Solaster*, which they would define thus:—Body with five or more arms, everywhere beset with penicilliform paxillæ, between these tentacular pores; two series of marginal plates, more or less developed, but concealed by the skin; anus central.

Danielssen & Koren (16) describe:—

Asterias gunneri, *hyperborea*, spp. nn.

Stichaster arcticus, sp. n.

Pedicellaster palæocrystallus, Sladen, = *P. typicus*, M. Sars.

Bathybiaster pallidus, g. & sp. nn.

And have notes on *Corethraster hispidus* and *Hymenaster pellucidus*.

They discuss in detail the characters of the genus *Solaster*, and of the claims to generic position of *Crossaster* and *Lophaster*, which they reject.

Danielssen & Koren (16) give a list of the 41 species of *Asteroidea* collected by the North Sea Expedition.

Bell (3) describes as new:—

Calvasterias antipodum.

Cribrella minuta, Ecuador.

Mithrodia victoriæ, Victoria Bank.

Fromia tumida, Ceylon.

And has notes on *Fromia indica*.

Asterias briareus, sp. n., Verrill, Am. J. Sci. (3) xxiii. p. 220, New England Coast.

Crossaster papposus, var. n. *septentrionalis*, Sladen, P. R. S. Edinb. xi. p. 705.

For a detailed description of *Archaster bifrons*, see Sladen, *ibid.* p. 699.

Archaster bairdi, sp. n., Verrill, Am. J. Sci. (3) xxiii. pp. 139-141, New England Coast.

Mimaster tizardi, g. & sp. nn. (perhaps allied to *Radiaster* of Perrier), Sladen, P. R. S. Edinb. xi. p. 702.

Caulaster pedunculatus, g. & sp. nn., Perrier (36).

Sladen (37) describes as new:—

Pteraster rugatus, *stellifer*, *semireticulatus*.

Retaster verrucosus, *peregrinator*, *gibber*, *insignis*.

Marsipaster, g. n., for *M. spinosissimus*, *hirsutus*.

Calyptraster, g. n., for *C. coa*.

Hymenaster formosus, *pergamentaceus*, *sacculatus*, *echinulatus*, *carnosus*, *glaucus*, *vicarius*, *infernalis*, *cælatus*, *crucifer*, *anomalus*, *latebrosus*, *porosissimus*, *graniferus*, *geometricus*, *pullatus*, *coccinatus*, *præcoquis*.

Benthaster, g. n., for *B. wyville-thomsoni* and *B. penicillatus*.

There are notes on *Hymenaster nobilis*, and *H. membranaceus* of Wyville-Thomson.

On *Oreaster bulbiferus*, Forbes, see P. H. Carpenter, Geol. Mag. (2) x. pp. 529–533.

OPHIUROIDEA.

Lyman (31) makes his work a handbook of the *Ophiuroidea*, which he regards as two families of star-fishes—*Ophiuridæ* and *Astrophytidæ*; the former are arranged in three groups. Some anatomical observations are scattered through the book, and there are plates devoted to anatomy; it concludes with various useful tables of the general results as to distribution, &c. The new species have all been described in earlier preliminary notices.

Restoration of disk in Ophiurans; Verrill, Ann. N. H. (5) ix. pp. 476 & 477.

Ophioderma guineense, sp. n., Greef, (20) p. 156, S. Thomé and Rolas.

Ophioglypha (or, see p. 247, *Ophiopleura*) *aurantiaca*, sp. n., Verrill, Am. J. Sci. (3) xxiii. p. 141.

Ophioglypha affinis, Verrill, is not the same as *O. affinis*, Lütken; *O. signata* proposed, *id. op. cit.* p. 222.

Amphiura macilenta, sp. n., *id. l. c.* p. 142 (perhaps the young of *A. abdita*, see p. 48).

Ophiothrix rathbuni, sp. n., Ludwig (29).

Ophiotricoides, g. n., allied to *Ophiothrix*, but with a naked disc. For *O. lymani*, sp. n., *id. ibid.*

Astronyx loveni, at Aberdeen; G. Sim, Zool. (3) vi. pp. 24 & 25.

HOLOTHUROIDEA.

Hoffmann (2) enumerates 38 species, and figures the spicules of *Myriotrochus rinki* and *Ancyroderma jeffreysi*.

Danielssen & Koren (15) give a full account of some genera already recorded [Zool. Rec. xvii. *Ech.* p. 10]; the accounts are full, and the illustrative plates remarkably fine.

Toxodora, g. n. Allied to *Chirodota*, tentacles 12. For *T. ferruginea*, sp. n.; Verrill, Am. J. Sci. (3) xxiii. p. 219.

Marenzeller (32) describes as new:—

Synapta ooplax, *distincta*, *autopista*.
Chirodota japonica.
Caudina ransonettii.
Cucumaria echinata.
Colochirus inornatus, *armatus*.
Thyonidium japonicum.
Orcula hypsipyrga.
Holothuria decorata.

And has notes on *Colochirus*, the generic characters of which are

emended; *Haplodactyla roretzii*, which is now called *Ancyroderma roretzii*; *Cucumaria longipeda*, and *Stichopus japonicus*.

Bell (8) divides the genus *Psolus* into 3 sub-genera, *Psolus*, s. str. (*Eupsolus*), *Lophothuria*, and *Hypopsolus*, subg. n. He describes as new *Psolus* (*Lophothuria*) *peronii* and *Hypopsolus ambulator* (Australia), and has notes on some of the known species.

Cucumaria frauenfeldi, sp. n., Ludwig, (30) p. 130, Cape of Good Hope.

Thyonidium magnum, sp. n., *id. l. c.* p. 132, Amboina.

Thyonidium flavum, sp. n., Greef, (20) p. 158, Rolas.

Stichopus (?) *tizardi*, sp. n., Théel, P. R. Soc. Ed. xi. p. 696.

Stichopus maculatus, sp. n., Greef, (20) p. 158, Rolas.

Théel (38) describes the following new *Elasipoda*, a term preferred to the earlier *Elasmopoda*, as being more correct:—

Fam. I. ELPIDIDÆ.

Parelpidia, g. n. "Body very long, cylindrical, Synapta-shaped. Processes of the dorsal surface almost inconspicuous. Calcareous deposits four-armed, with a single long central process, directed outwards." For *Elpidia elongata* and *P. cylindrica*, sp. n.

Elpidia rigida, purpurea, willemoesi, incerta, ambigua, spp. nn.

Scotoplanes, g. n. "Distinguished from *Elpidia* by the presence of unbranched spicula, or three-armed bodies, and by the constant possession of C-shaped spicules." For *E. globosa, E. mollis, E. papillosa, E. murrayi*; *S. albida, robusta, insignis*, spp. nn.

Kolga nana = *Elpidia nana*.

Peniagone, g. n. "Dorsal surface with a large lobe-like appendage anteriorly, and commonly with some minute processes." For *P. wyvillii, P. lugubris, P. horrifer, P. atrox, P. naresi, P. challengeri, P. vitrea, P. affinis*, spp. nn.

Scotoanassa, g. n. "Body very depressed, with a large brim round its anterior and posterior ends." For *S. diaphana*, sp. n.

Enypniastes, g. n. Pedicels round the posterior end of the body. For *E. eximia*, sp. n.

Achlyonice paradoxa, now called *A. ecalcarea*; *A. lactea*, sp. n.

Fam. II. DEIMATIDÆ.

Lætmogone spongiosa, for *Cryodora spongiosa*. The genus *Cryodora* is annulled.

Pannychia, g. n. Distinguished from *Lætmogone* by having 20 tentacles, and a double row of pedicels on the odd ambulacrum. For *P. moseleyi*, sp. n.

Fam. III. PSYCHROPOTIDÆ.

Psychrotrephes, g. n. "Body very thin and depressed, with the brim round its anterior and posterior extremities rather broad. Mouth and anus ventral, at some distances from the ends of the body. Tentacles ten." Odd ambulacrum naked. For *P. exigua*, sp. n.

Euphronides, g. n. Odd ambulacrum with a double row of pedicels, dorsal surface with a large appendage crossing the odd interambulacrum. For *E. depressa*, sp. n.

Psychropotes, g. n. Dorsal appendage large, and posterior. For *P. longicauda*, sp. n., & varr. nn. *monstrosa*, *fusco-purpurea*; *P. loveni*, *P. semperiana*, spp. nn.

Benthodytes, g. n. No large appendage on dorsal surface. Fo *B. papillifera*, *B. typica*, *B. sanguinolenta*, and var. n. *marginata*, *B. abyssicola*, *sordida*, *mamillifera*, *selenkiana*, spp. nn.

CRINOIDEA.

The method of formulation proposed by Bell in his "Attempt" (6) is closely criticised by Carpenter (14), but the details are beyond the scope of the Record.

Carpenter (12) finds that an elongated calyx resembling that of *R. rawsoni* is chiefly found in those individuals of *Rhizocrinus lofotensis* which have the arms best developed: and, *inter alia*, gives some information as to the histological characters of *Holopus*, the tissues of which are not, as some have thought, imperfectly differentiated.

Carpenter (13) describes as new :—

Antedon lævipinna (Canton), *æquipinna*, *imparipinna*, *variipinna* (Canton), *crenulata* (Borneo), *acuticirra*, *ludovici* (Hong Kong), *bipartipinna* (Hong Kong).

Actinometra robusta (Lütken, MSS.) (Australia), *grandicalyx* (Canton), *meyeri* (Philippines).

And has notes on or descriptions of—

Antedon carinata.

Actinometra solaris, *parvicirra*, *multiradiata*, *bennetti*.

Antedon eschrichti, var. *magellanica*, Bell (7), Straits of Magellan.

Actinometra annulata, sp. n., Bell (6), Australia.

Antedon dentata of Say is a synonym of and has prior claims to *A. sarsi*; Verrill, Am. J. Sci. (3) xxiv. p. 222.

Carpenter describes *Atelecrinus balanoides* and *A. cubensis* (Pourt.), and *A. wyvillii*, sp. n.

The name *Eudiocrinus* is proposed for *Ophiocrinus* (Semper), already adopted, and *E. varians*, *E. semperi*, and *E. japonicus*, spp. nn., are described.

Carpenter (12) describes *Pentacrinus blakii*, sp. n., and has notes on *P. asteria*, *P. muelleri*, *P. decorus*, and on *Rhizocrinus lofotensis* and *R. rawsoni*.

Antedon, sp. (Ceylon), Bell (10).

Plicatocrinus, a true Neocrinoid; Zittel, SB. bayer Ak. 1882, pp. 107–113, pls. i. & ii.

New Devonian Crinoids; Oehlert, Bull. Soc. Géol. (3) viii. pp. 620–633.

Etheridge & Carpenter (Ann. N. H. 5, ix. pp. 225–246) have found that what appear to be portions of the calyx-plates in *Orophocrinus stelliformis* are really the lateral portions of wide and somewhat petaloid ambulacra. Various points in the morphology of the *Blastoidea* are discussed.

CŒLENTERATA.

HYDROZOA AND CTENOPHORA, BY ALFRED GIBBS BOURNE, B.Sc. (LOND.), &c.

ANTHOZOA, BY SYDNEY J. HICKSON, B.Sc. (LOND.), B.A., &c.

HYDROZOA AND CTENOPHORA.

1. ALLMAN, G. R. Recent Progress in our Knowledge of the Development of the *Ctenophora*. J. L. S. xvi. pp. 89–109.

The author reviews his own work in this department, as well as that of Fol, Kowalewsky, Agassiz, and Chun.

2. BALE, W. M. On the *Hydroida* of S. E. Australia, with descriptions of supposed new species, and notes on the genus *Aglaophenia*. J. Micr. Soc. Vict. ii. pp. 15–48, pls. xii.–xv.

This district possesses a Hydroid fauna so different from any other region, that Allman has ranked it as a distinct province. 36 species of *Sertulariidæ* and 21 species of *Plumulariidæ* are known in S. E. Australia and Tasmania. The following species are described as new to the locality dealt with:—*Sertularia bispinosa*, *S. trispinosa*, *S. minima*, *S. flosculus*, *S. pulchella*, *S.* (*Diphasia?*) *sub-carinata*, *S. patula*, *S. loculosa*, *Sertularella neglecta*, *S. simplex*, *S. johnstoni*, *Thuiaria ambigua*, *Plumularia campanula*, *Aglaophenia divaricata*. Five new species of *Sertularia*, 5 of *Sertularella*, 1 of *Thuiaria*, a new genus *Halicornopsis*, for a single species *H. avicularis*, 8 new species of *Aglaophenia*, and 9 of *Plumularia* are described.

3. BROOKS, W. K. List of *Medusæ* found at Beaufort, N.C., during the summers of 1880 and 1881. Stud. Biol. Lab. Hopkins Univ. ii. pp. 135–146.

Turritopsis nutricula (McCrady), *Cunina octonaria* (McCrady), the young existing as a parasite within the bell of *Turritopsis*; *Nemopsis bachii* (L. Agassiz) = *N. gibbesi* (McCrady); *Phortis gibbosa* (McCrady) = *Eirene gibbosa* (L. Agassiz), = *Irene gibbosa* (Hæckel); *Amphinema apicatum* (Hæckel) = *Saphenia apicata* (McCrady), = *Stomotoca apicata* (L. Agassiz), and *Liriope scutigera* (McCrady) are described as occurring at Beaufort, N.C.

4. Chun, C. Die Gewebe der Siphonophoren, ii. Zool. Anz. v. pp. 400–406.

Continuing his researches, the author describes a nervous system in *Rhizophysa*, *Physalia*, and *Apolemia uvaria*.

5. ——. Die mikroskopischen Waffen der Cœlenteraten. Humboldt, Heft ii. pp. 54–57.

6. Clarke, S. F. New Hydroids from Chesapeake Bay. Mem. Bost. Soc. iii. pp. 135–142, 3 pls.

Six species, all Gymnoblastic, are described, five being new, and for one of these a new genus, *Calyptospadix*, is formed.

7. Claus, C. Zur Wahrung der Ergebnisse meiner Untersuchungen über *Charybdea* als Abwehr gegen der Haeckelismus. Arb. z. Inst. Wien, iv. pp. 229–312.

8. Conn, H. W. Development of *Tubularia cristata*. Hopkins Univ. Circ. No. 17, p. 247, and Zool. Anz. v. pp. 483 & 484.

The author corrects Ciamician in certain particulars, and shows that *Tubularia* does not present any noteworthy differences from other Hydroids in its development.

9. ——, & Beyer, H. G. The Nervous System of *Porpita*. Stud. Biol. Lab. Hopkins Univ. ii. pp. 433–455, pl. xxxv.

Nerve ganglion cells have been described in the ectoderm in *Vellela* by Chun; the observations in the present paper confirm his statement as to the existence of a nervous system in the *Siphonophora*, and extend our knowledge of the relation and distribution of the same. The authors describe a series of organs around the edge of the velum, which they regard as organs of sense, possibly tactile.

10. Fewkes, J. W. The Siphonophores. iv. Anatomy and Development of *Diphyes*. Am. Nat. xvi. pp. 89–101.

The author continues his researches in this subject. [See Zool. Rec. xviii. *Cœl.* p. 2.]

11. ——. Notes on the *Acalephæ* from the Tortugas, with a description of new Genera and Species. Bull. Mus. C. Z. ix. pp. 251–289.

The author describes new *Medusæ* collected at Key West and the Tortugas Islands, in March and April, 1881. He also gives an account of the anatomy and development of *Linerges*, *Cassiopea* (*Polyclonia*), *Ocyroe*, and a stage in the embryology of *Eucharis*. 6 new species of *Siphonophora*, 2 new genera and 3 new species of *Hydroida* are also described. New larval stages of growth, illustrative of the development of *Glossocodon*, are also figured and described.

12. ——. On the *Acalephæ* of the East Coast of New England. *L. c.* pp. 291–310.

The author describes the *Medusæ* taken by him at Newport, Rhode Island, in the summer of 1881, and also the *Acalephæ* collected by the U. S. Fish Commission, off the New England Coast. Among these latter were two Ctenophores, which may probably be referred to the genus *Beroe*.

The species was not determined; numerous *Siphonophora*, including a new Physophore, *Haliphota*, g. n., and three new Hydroids:—*Calycopsis*, *Stomatonema*, and *Halicreas*, gg. nn.

13. Guppy, H. B. Habits of *Scyphomedusæ*. Nature, xxvii. p. 31.

14. Haeckel, Ernst. Report on the Deep-sea Medusæ, dredged by H.M.S. 'Challenger,' during the years 1873-76. Part xii. Zoology, Vol. iv. of Report of the Scientific Results of the Voyage of H.M.S. 'Challenger,' &c., prepared under the superintendence of the late Sir C. Wyville Thomson, and now of John Murray. London, Edinburgh, and Dublin: 1882, 4to, pp. cv. & 154, pls. i.-xxxii., and woodcuts. [See Zool. Rec. xviii. for German edition.]

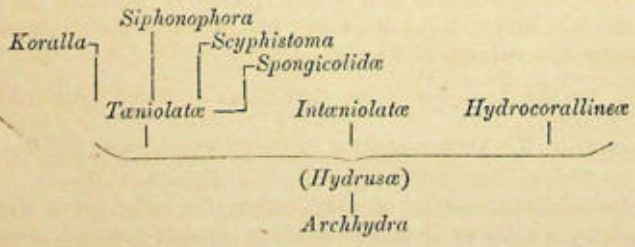
15. ——. Directe und indirecte Entwickelung von *Aurelia aurita*. Jen. Z. Nat. xv. SB. pp. 14 & 15. [*Cf.* Zool. Rec. xviii. *Cœl.* p. 3.]

Aurelia normally undergoes an indirect development passing through *Strobila* and *Scyphistoma* stages; it is, however, here shown that it may have a "shortened direct development," such as is normal in *Pelagia*. On the other hand, it is known that *Chrysaora*, the nearest ally of *Pelagia*, undergoes the same indirect development, or metagenesis, which is normal in *Aurelia*.

16. Hamann, O. Zur Entstehung und Entwickelung der grünen Zellen bei *Hydra*. Z. wiss. Zool. xxxvii. pp. 457-464.

17. ——. Der Organismus der Hydroidpolypen. Jen. Z. Nat. xv. pp. 473-544.

The author enters at some length into the minute histology of the polyp-body. He describes tæniolæ, which had been observed by G. v. Koch in *Tubularia*, as occurring in several other genera, and uses this fact in his classification, distinguishing *Tæniolatæ* from *Intæniolatæ*. He also describes muscles in the endoderm confined in the *Intæniolatæ* to the hypostome, but occurring in the stomach also in the *Tæniolatæ*; and denies the existence of any true sensory ectodermal cells, or nerves, such as have been more recently described by Jickeli. Certain yellow cells similar to those found in Radiolarians and some *Anthozoa*, are to be found in the entoderm in a species of *Aglaophenia*, and are regarded by the author as parasitic *Algæ*. Gland-cells are found in the ectoderm. As a result of this study of the embryology of certain forms, the author has come to the conclusion that the planula is always formed by delamination. The author considers the Hydroid-polyps to be related to the *Siphonophora* and the *Anthozoa*, thus:—



The Hydroid-polyps are further classified thus :—

HYDROPOLYPI.

Ord. 1. *Intæniolatæ.*
Fam. 1. *Hydrinæ* : *Hydra.*
2. *Campanularinæ* : *Campanularia, Obelia, Lafoea,* &c.
3. *Sertularinæ* : *Sertularia, Plumularia,* &c.
Ord. 2. *Tæniolatæ.*
Sub-Ord. A. *Acolloblastæ.*
Fam. 1. *Clavidæ* : *Turris, Cordylophora, Corydendrium, Clava.*
2. *Corynidæ* : *Coryne, Syncoryne, Zanclea.*
3. *Atractylidæ* : *Atractylis, Perigonimus, Garveia, Dicoryne, Binneria, Bougainvillea, Diplura.*
4. *Eudendridæ* : *Eudendrium.*
5. *Hydractinidæ* : *Hydractinia.*
6. *Podocorynidæ* : *Podocoryne, Corynopsis.*
7. *Cladonemidæ* : *Cladonema.*
8. *Nemopsidæ* : *Nemopsis.*
9. *Pennaridæ* : *Pennaria, Stauridium, Vorticlava,* &c.
10. *Cladocorynidæ* : *Cladocoryne.*
11. *Myriothelidæ* : *Myriothela.*
12. *Clavatellidæ* : *Clavatella.*
13. *Monocaulidæ* : *Monocaulii.*
14. *Tubularidæ* : *Tubularia, Corymorpha, Ectopleura, Hybocodon, Amalthæa, Acaulis.*
Sub-Ord. B. *Colloblastæ.*
Fam. 1. *Spongicolidæ* : *Spongicola.*
2. *Scyphistomidæ.*

The author describes one new species of *Podocoryne*, *P. hæckeli*, and one of *Plumularia*, *P. fragilis*. In conclusion, he discusses the subject of histiogenesis as exemplified in the Hydroid-polyps.

18. ——. Studien über Cœlenteraten. Jen. Z. Nat. xv. pp. 545–557.

The author deals with the nematophores among the *Hydroida*, and with the pseudopodial cells of *Hydra*. The nematophores develope in interstitial ectodermal cells. The author thinks it possible to contrast *Hydra* with all other Hydroid-polyps, on account of certain pseudopodial ectodermal cells which he describes as occurring at the base, and which are absent in other Hydroids, and he considers this to be evidence in favour of the primitive and ancestral nature of *Hydra*.

19. HOLM, G. Bidrag till kännedomen om Skandinaviens Graptoliter. Trenne nya Slägten af familien Dichograptidæ Lapa. Œfv. Ak. Förh. xxxviii. pp. 45–51.

[The Recorder has not seen this paper.]

20. HOPKINSON, J. On some points in the Morphology of the *Rhabdophora*, or true Graptolites. Ann. N. H. (5) ix. pp. 54–57.

This memoir is based upon an examination of a collection of Graptolites made by Mr. Dover from the Skiddaw slates. Some of these are

very large specimens of branches of *Didymograpti* and *Tetragrapti*, evidently fragments, but attaining a foot in length.

21. Jickeli, C. F. Vorläufige Mittheilung über das Nervensystem der Hydroid-polypen. Zool. Anz. v. pp. 43 & 44.

22. ——. Über *Hydra*. L. c. pp. 491–493.

23. ——. Der Bau der Hydroid-polypen. 1. Über den histiologischen Bau von *Eudendrium*, Ehbg., und *Hydra*, L. Morph. JB. viii. pp. 373–416.

This is the first of a series of papers which will contribute largely to our knowledge of the minute histology of Hydroid-polyps, more especially with regard to their nervous system.

24. Jung, H. Beobachtungen über die Entwickelung des Tentakelkrauzes von *Hydra*. Morph. JB. viii. pp. 339–350.

The author has examined a large number of specimens belonging to the three species, *H. grisea*, *H. oligactis*, and *H. viridis*, and finds that while there is no fixed law respecting the order of development of the tentacles, a typical Order may be recognized for each species, to which a large number of individuals conform.

25. Korotneff, A. Zur Kenntniss der Siphonophoren. Zool. Anz. v. pp. 360–363.

The author has examined *Forskalia ophiura*, *Agalma rubra*, *Apolemia uvaria*, and *Hippopodius gleba*, to ascertain if a nervous system such as has been described in other *Hydrozoa* exists in the *Siphonophora*; and has come to the conclusion that it does.

26. Lankester, E. Ray. Further observations on the Fresh-water Medusa (*Limnocodium sowerbii*), made during the summer of 1881. Nature, xxv. pp. 444–446.

27. ——. The Chlorophyll Corpuscles of *Hydra*. Op. cit. xxvii. pp. 87 & 88.

28. Lendenfeld, R. von. Über eine Übergangsform zwischen Semostomen und Rhizostomen (*Pseudorhiza aurosa*, g. & sp. nn.). Zool. Anz. v. pp. 380–383.

29. ——. Über Cœlenteraten der Südsee. 1. *Cyanea annaskala*, sp. n. Z. wiss. Zool. xxxvii. pp. 465–552.

The author gives a most elaborate description of the whole anatomy of this form.

30. Marshall, W. Über einige Lebenserscheinungen der Süsswasserpolypen, und über eine neue Form von *Hydra viridis*. Z. wiss. Zool. xxxvii. pp. 664–702.

31. Mereschkowsky, C. de. Sur les Nématophores des Hydroides. Bull. Soc. Z. Fr. iii. & iv. pp. 280 & 281.

32. ——. Structure et développement des Nématophores chez les Hydroides. Arch. Z. expér. x. pp. 583–610.

The author has come to the conclusion that the Nematophores are degenerate individuals.

33. Mereschkowsky, C. Développement des Spermatozoides dans la Méduse. (*Cassiopea borbonica*). L. c. pp. 577–582.

34. Möbius, K. Wassergehalt der Medusen. Zool. Anz. v. pp. 586 & 587.

35. Pillsbury, J. H. Development of the Planula of *Clava leptostyla*, Ag. Am. Micr. J. iii. pp. 181 & 182.

36. Tullberg, S. A. On the Graptolites described by Hisinger and the older Swedish authors. Stockholm : 1882, 8vo, 22 pp.

37. Varenne, A. de. Développement de l'œuf de la *Podocoryne carnea*. C. R. xciv. pp. 892–894.

38. ——. On the Origin of the Spermatozoids in the Hydroids. Ann. N. H. (5) ix. pp. 133–135.

39. ——. Récherches sur la reproduction des Polypes hydraires. Arch. Z. expér. x. pp. 611–710.

40. ——. Récherches sur les Polypes hydraires (Reproduction et Développement). Paris : 1882, 8vo, 104 pp., 10 pls.

The question as to the place of origin of the sexual products in Hydroids still continues to call forth conflicting opinions, but we now appear to be coming nearer to the truth. It has been shown by Weismann [*cf.* Zool. Rec. xviii. *Cœl.* p. 6] that, putting aside for the moment the question as to ectodermal or endodermal origin, the generative products in either need not originate in special reproductive individuals (gonophores), but that they may originate in the parenchyme of the colony—the cœnosarc ; and he proposed to distinguish a cœnosarcal from a blastoidal origin, asserting that all Hydroids producing free-swimming *Medusæ*, and probably numerous forms with fixed *Medusæ*, belong to the blastogonous group. The author of the present memoir had come to somewhat similar conclusions [*cf.* Zool. Rec. xviii. *Cœl.* pp. 5 & 6], but now he goes further, and shows that in the forms which he has studied—*Campanularia flexuosa, Plumularia echinulata, Sertularia pumila, Gonothyræa loveni, Podocoryne carnia*, and *Obelia geniculata*—the ova or spermatozoa alike develope, whether matured in fixed sporosacs, in Medusoids which remain fixed (*Gonothyræa loveni*), or in Medusoids which have a free existence, in the cœnosarc of the polyp, and, moreover, originate from endodermal cells. The author believes that previous observers who have put forward the ectoderm as the place of origin of the sexual products of either sex, have been misled by the fact that, in many cases, although actually originating as stated above, such cells migrate even after they have reached the reproductive bud ; the endoderm reforms itself beneath the eggs or spermatozoa, and a new homogeneous membrane (stützlamella) is secreted by the newly-formed endodermal cells, which might easily be mistaken for the original structureless lamella—the latter, as well as the ectodermal layer, having become reduced, on account of the pressure exercised by the developing eggs or spermatozoa to an extremely thin layer, which, however, passes outside the sexual products. It has been usual to consider the gonophores, whether these remain fixed (sporosacs) or become free-swimming

Medusæ, as the generative individuals, the polyps being asexual; but if the observations above recorded are true, and should be proved to have the universal occurrence that De Varenne believes they have, the view now usually held, that there is an alternation of generations among the gymnoblastic and calyptoblastic Hydroids, must be given up, asexual buds and sexual generative products both arise in the trophosome; the latter, however, become collected in specialized buds, which may, to the obvious advantage of the species, become detached, and actively encounter, and even acquire, a higher organization than the attached trophosomes.

41. Weismann, A. Sur des organes particuliers de l'*Eudendrium racemosum*. Arch. Sci. nat. (3) vii. pp. 103 & 104, and Ann. N. H. (5) ix. pp. 201 & 202. [Zool. Rec. xviii. *Cœl.* p. 7.]

New genera and species :—

Sub-Class HYDROMEDUSÆ.

Order i., Gymnoblastea-Anthomedusæ.

Calyptospadix, g. n., S. F. Clarke, (6) p. 136.

Trophosome. Hydrophyton consisting of a branching hydrocaulus rooted by a creeping filiform hydrorhiza. Hydranths fusiform, with filiform tentacles, which are arranged in a single verticil round the base of a conical hypostome. Perisarc developed into large hydrotheca-like processes.

Gonosome. Sporosacs developed on the ultimate ramuli beneath the terminal hydranths.

C. cerulea, sp. n., Clarke, (6) p. 136, pl. vii. figs. 1–9, Fort Wool, Virginia. This form presents a very close approximation to the Calyptoblastea of Allman.

Eudendrium corneum, sp. n., Clarke, (6) p. 137, pl. vii. figs. 10–17, Fort Wool, Virginia.

Sytlactis argo, sp. n., Clarke, (6) p. 138, pl. viii. figs. 18–20, Crisfield, Maryland, on the Chesapeake Bay.

Lovenella gracilis, sp. n., Clarke, (6) p. 139, pl. ix. figs. 25–39.

Bougainvillia rugosa, sp. n., Clarke, (6) p. 140, pl. viii. figs. 21–24, Hampton Roads, lower part of Chesapeake Bay.

Calycopsis, g. n., Fewkes, (12) p. 304; for *C. typa*, sp. n., *id. ibid.*, pl. i. fig. 34, Coast of New England.

Halitiara, g. n., Fewkes, (11) p. 276; for *H. formosa*, sp. n., *id. ibid.* pl. iv. fig. 2, Tortugas.

Halicalyx, g. n., Fewkes, (11) p. 277; for *H. tenuis*, sp. n., *id. ibid.* pl. vii. fig. 15, Key West, Florida.

Podocoryne hæckeli, sp. n., Hamann, (17) p. 519, pl. xxiv. figs. 15 & 16, Naples.

Order ii., Calyptoblastea-Leptomedusæ.

Sertularia minuta, sp. n., Bale, (2) p. 21, pl. xii. fig. 1, Sorrento, S. E. Australia; *S. pumiloides*, sp. n., Bale, (2) p. 21, pl. xii. fig. 2, Queens-

cliff; this species differs from *S. minima*, D'A. W. Thompson, in the absence of the short transverse marking along each margin of the hydrorhiza. *S. bicornis*, sp. n., Bale, (2) p. 22, pl. xii. fig. 3, Queenscliff; *S. acanthostoma*, fig. 4, Robe, S.A. ?, and *S. recta*, fig. 5, Brighton, S.A.; spp. nn., Bale, (2) p. 23, pl. xii.

Sertularella levis, p. 24, pl. xii. fig. 6, Williamstown; *S. indivisa*, ibid. pl. xii. fig. 7, Williamstown, St. Kilda; *S. solidula*, ibid. pl. xii. fig. 8, Williamstown; *S. pygmæa*, p. 25, pl. xii. fig. 9, Queenscliff, Griffith's Point (closely resembles *S. johnstoni*, Gray, in the form of the calycles, but differs in its minute size and simple habit), and *S. macrotheca*, ibid. pl. xiii. fig. 1, Griffith's Point, Bale, (2), spp. nn.

Thuiaria lata, sp. n., Bale, (2) p. 26, pl. xiii. fig. 2, Griffith's Point.

Halicornopsis, g. n., Bale, (2) p. 26; hydrothecæ unilateral, uniserial, with a single sarcotheca attached to the front of each; no other sarcothecæ on the polypidom; gonothecæ without corbulæ. *H. avicularis*, sp. n., Bale, (2) p. 26, pl. xiii. fig. 3, Robe and Point Elliott, S.A. ?.

Aglaophenia superba, p. 27, pl. xiii. fig. 4, Griffith's Point; *A. ascidioides*, p. 32, pl. xiii. fig. 5, Queenscliff (closely allied to *A. superba*, but much smaller, and differs in the number and arrangement of the teeth of the calycles, &c.); *A. ilicistoma*, p. 33, pl. xiv. fig. 4, Queenscliff, Robe, S.A. ?; *A. thompsoni*, p. 33, pl. xiv. fig. 1 (= *A. longirostris*, Kirchenpauer, var.), Griffith's Point, S. Australia; *A. prolifera*, p. 34, pl. xiv. fig. 5, Queenscliff; *A. parvula*, p. 35, pl. xiv. fig. 3, Queenscliff (closely resembles the British species, *A. pluma*); *A. maccoyi*, p. 36, pl. xiv. fig. 2, Queenscliff, Robe, S.A. ?; *A. plumosa*, p. 37, pl. xiv. fig. 6, Queenscliff, Aldinga, S.A. ?: Bale, (2) spp. nn.

Plumularia indivisa, p. 39, pl. xv. fig. 1, Williamstown; *P. producta*, p. 39, pl. xv. fig. 3, Queenscliff; *P. setaceoides*, p. 40, pl. xv. fig. 4, Williamstown, Queenscliff; *P. delicatula*, p. 40, pl. xv. fig. 2, Griffith's Point; *P. goldsteini*, p. 41, pl. xv. fig. 7, Queenscliff; *P. hyalina*, p. 41, pl. xv. fig. 9, Queenscliff; *P. spinulosa*, p. 42, pl. xv. fig. 8, Queenscliff; *P. pulchella*, p. 42, pl. xv. fig. 6, Queenscliff; *P. compressa*, p. 43, pl. xv. fig. 5, Robe, S.A. ?: Bale, (2) spp. nn.

Plumularia fragilis, sp. n., Hamann, (17) p. 529, pl. xxv. fig. 1, Naples.

Chromatonema, g. n., Fewkes, (11) p. 305, for *C. rubrum*, sp. n., *id. ibid.* pl. i. fig. 40, Coast of New England.

Order iii., Trachomedusæ.

Aglaura vitrea, sp. n., Fewkes, (11) p. 277, pl. vii. fig. 10, Tortugas.

Order iv., Narcomedusæ.

Halicreas, g. n., Fewkes, (12) p. 306, for *H. minimum*, sp. n., *id. ibid.* The genus is the type of a new family related to the *Discophora* more intimately than are the *Narcomedusæ*, among which it will probably be placed.

Order vi., Siphonophora.

Stephanomia (*Forskalia*) *atlantica*, sp. n., Fewkes, (11) p. 264, pls. v.

fig. 1, vi. figs. 18–22, Tortugas. This species possesses a multiserial arrangement of the swimming bells.

Agalma papillosum, sp. n., Fewkes, (11) p. 266, pls. v. figs. 5 & 6, vi. fig. 27, Key West, Florida.

Agalmopsis fragile[*-lis-*], sp. n., Fewkes, (11) p. 267, pls. v. fig. 2, vi. figs 16, 17, 23, 24 & 25, Key West, Florida.

Rhizophysa gracilis, sp. n., Fewkes, (11) p. 269, pl. vi. figs. 1–6, Tortugas.

Athorybia formosa, sp. n., Fewkes, (11) p. 271, pls. v. figs. 3 & 4, vi. figs. 7–14, Tortugas. This genus has never been found before in American waters.

Haliphyta, g. n., Fewkes, (12) p. 302, for *H. magnifica*, sp. n., *id. ibid.* pl. i. figs. 39 & 40. The single specimen appears to have been much mutilated ; Coast of New England.

Sub-Class SCYPHOMEDUSÆ.

Order iv., DISCOMEDUSÆ.

Pseudorhiza, g. n., Lendenfeld, (28) p. 380. Presents characters intermediate between the *Semostomæ* and *Rhizostomæ* ; for *P. aurosa*, sp. n., *id. ibid.*, Port Phillip, Australia.

Cyanæa anaskala, sp. n., Lendenfeld, (29) pp. 463–552, pls. xxvii.–xxxiii., Port Phillip.

ANTHOZOA.

1. ANDRES, A. Intorno alla scissiparità delle Attinie. MT. z. Stat. Neap. iii. p. 124, pl. vii.
2. CARTER, H. J. On remarkable forms of *Cellepora* and *Palythoa*. Ann. N. H. (5) ix. p. 418.
3. DAMON, W. E. Coral in an Aquarium. Am. Micr. J. iii. p. 221.

This paper contains an account of some observations of the feeding of the specimens of *Astrangia*, *Oculina*, *Porites*, &c., kept in an aquarium.

4. DUNCAN, P. M. On some recent Corals from Madeira. P. Z. S. 1882, p. 213.
5. ——. Sind Fossil Corals and *Alcyonaria*. Abstr. in Neues JB. Mineral. 1882, p. 310.
6. MILNE EDWARDS, A. Summary Report upon a Zoological Exploration made in the Mediterranean and Atlantic on board the 'Travailleur.' Ann. N. H. (5) iv. p. 39.

Corallaria were not numerous, but some specimens of *Dendrophyllia* and *Caryophyllia* were found.

7. FOLLMAN, O. Die unterdevonisch Schichten von Olkenbach. Verh. Ver. Rheinl. xxxix. p. 129.

8. Giglioli, H. H. Precious Coral. Nature, xxv. p. 552.

The author states in answer to H. N. Moseley that *Corallium secundum*, Dana, has been found in large quantities at Okinava or Kotshi, in Japan.

9. Greeff, K. Ueber die Corallenfischerei an der Küste der Capverdischen Insel Santiago. Zool. Anz. iv. p. 490.

10. Hertwig, R. Die Tiefseeactinien des 'Challenger.' SB. Jen. Ges. 1881, p. 10.

11. ——. Report on the *Actiniaria* dredged by H.M.S. 'Challenger' during the years 1873–1876. Zoology of H.M.S. 'Challenger,' part xv., 134 pp., 14 pls.

This report (at present incomplete) is translated from the German. Hertwig takes the structure and arrangement of the septa as the fundamental principle in the classification of the *Actiniaria*, and distinguishes six tribes—(1) *Hexactiniæ*, (2) *Paractiniæ*, (3) *Monauleæ*, (4) *Edwardsiæ*, (5) *Zoantheæ*, and (6) *Cerianthea*. As regards the distribution of the *Actiniæ*, the author remarks that, as a rule, their number decreases as the depth increases, and they have not at present been observed at a greater depth than 2900 fathoms. Again, as regards the relation in which the fauna of different depths stand to one another, the greater the depth, the more the fauna varies from that of the coast. The influence of living at great depths upon the character of the *Actiniæ* can be distinctly recognized in many forms, and is shown by the nature of the tentacles which have undergone retrograde formation, and are transformed first into tubes, and afterwards into simple openings in the oral disk. Again, the arrangement of the septa typical of the *Hexactiniæ* is only present in thirteen genera.

12. ——. Bau der Ovarien bei den Actinien. SB. Jen. Ges. 1881, p. 18. Abstr. in J. R. Micr. Soc. (2) ii. p. 795.

The author finds in *Corallimorphus rigidus* that the smallest ova form groups of 2–4 cells between the bases of the epithelial cells. Young egg-cells are connected with the epithelium by a short cord; and when they leave this region, they pass into the mesoderm.

13. Jordan, H. Die Theorien über die Entstehung der Korallenriffe. Biol. Centralbl. ii. p. 515.

After discussing the views held by Chamisso, Darwin, and Dana, the author describes at some length the evidence of Semper's researches in the Pelew Islands, and maintains that Darwin's subsidence theory cannot account for the formation of all reefs and atolls.

14. Kayer, E. Obercarbonische Fauna von Löping. In Richthofen's "China," iv. Palæontologie. (Berlin: 1882, 4to.) *Anthozoa*, pp. 194–198, pls. xxix. figs. 7–13 & 15, and xxiv. figs. 4 & 5.

15. Koby, F. Polypiers jurassiques de la Suisse. Mém. Soc. Pal. Suisse, vii. & viii. 108 pp., 30 pls.

16. Koch, G. von. Anatomie der *Clavularia prolifera* (sp. n.). Morphol. JB. vii. p. 467, pls. xxii. & xxiii. Abstr. in J. R. Micr. Soc. (2) ii. p. 349.

After a description of the anatomy and histology of *Clavularia pro-*

lifera, the author discusses the budding of certain *Alcyonaria*. In *Sympodium*, the polyps arise from a creeping stolon, and are situated at a greater or less distance from one another, and externally to the stolon are quite free. Only in a few cases are certain of the polyps bound together in a bundle. In small specimens of *Alcyonium* it can be proved that the structure is exactly the same as the "pseudo-büschen" of *Sympodium*, and that the polyp cavities are in communication with one another only by the intermediation of nutritive canals. The condition of *Spongodes* is exactly the same as *Alcyonium*; and in *Paralcyonium* and *Funiculina*, in which the polyps are much more closely bound together, it can be proved by means of sections that the buds do not arise from the mother polyps, but from canals connecting two neighbouring polyps together. Then follows a note on a peculiar structure in *Clavularia ochreacea*. In some comparative remarks at the end of the paper, on the connection of the buds with the stolon in *Clavularia prolifera*, the author maintains that the network of canals from which the young buds spring in other Alcyonarians is really homologous with the stolon of *Clavularia* and allied forms; and in another note on "the relation of the spicules and their horny sheaths with the ectoderm," he maintains that *Clavularia* proves the hard skeletal parts of the Alcyonarians to be primarily derivatives of the ectoderm.

17. Koch, G. von. Mittheilungen über das Kalkskelet der Madreporarien. Morphol. JB. viii. p. 85, pl. iii. Abstr. in J. R. Micr. Soc. (2) ii. p. 795.

This paper is divided into two parts—1. The law of the increase of the septa; 2. On the signification of the theca. The author's conclusion on the first part is, that throughout the *Hexactinæ*, both Eporosa and Imperforata, the increase of septa is practically simultaneous, and that modifications of this law must be due either to adaptation or inherited variations in the growth of the whole animal. In the second part he brings forward some further evidence from researches on young *Cladocora*, young *Caryophyllia*, *Paracyathus*, and *Dendrophyllia*, to support the view that the theca is not formed by a calcification of the derma, but by a secondary fusion of the septa.

18. ——. Die morphologisch Bedeutung des Korallenskelets. Biol. Centralbl. ii. p. 583.

19. ——. Mittheilungen über die Structur von *Pholidophyllum loveni* und *Cyathophyllum* aus Konisprus. Palæontographica, xxviii. 6, pp. 1–12.

20. ——. Ueber die Entwickelung des Kalkskelets von *Asteroides calycularis* und dessen morphologischer Bedeutung. MT. z. Stat. Neap. iii. p. 284, pls. xx. & xxi.

[illegible]. ——. Vorlaufige Mittheilungen über die Gorgonien (*Alcyonaria* [illegible]*xifera*) von Neapel und über die Entwickelung der *Gorgonia verru*[illegible]*a*. L. c. p. 537, 15 woodcuts. Abstr. in J. R. Micr. Soc. (2) ii. [illegible]06.

[illegible]econd part of this paper, the author describes the segmentation

of the ovum and early stages in the development of *Gorgonia verrucosa*. The ovum is surrounded by a hyaline membrane, and is attached by a stalk to the mesentery. In the course of segmentation, there is a stage with sixteen segments, which is figured. The formation of the gastrula takes place apparently by delamination. After the ciliated embryo has come to rest, an invagination of the unattached pole takes place, to form the mouth and stomodæum, but the communication between the œsophagus and body cavity is not effected until a comparatively late period.

22. Lindstrom, G. Obersilurische Korallen von Tshan-tiën. In Richthofen's "China," iv. pp. 50–74, pls. v.–vii.

23. Kowalevsky, A., & Marion, A. F. Sur le développement des Alcyonaires. C. R. cxv. pp. 562–565. Abstr. Ann. N. H. (5) x. p. 413, and J. R. Micr. Soc. (2) ii. p. 797.

The authors describe their researches upon the development of two species of *Clavularia* and *Sympodium coralloides*. The fecundated ovum remains in *C. crassa* quiescent for some time before dividing. When segmentation occurs, it is, at first, very rapid. The primitive nucleus must, at its first division, be unable to carry with it the whole mass of vitellus as nutritive substance. The derived nuclei undoubtedly emigrate towards the periphery, as is the case in some *Crustacea* ; but when they are numerous enough, they determine a splitting up of the vitellus, which becomes rapidly marked out, producing segmentation spheres, which penetrate angularly to the centre of the ovum. After this, the distinction between a central nutritive part and a peripheral evolutive part persists in the segmentation spheres themselves. The larva, when it issues from the ovum, with its characteristic appearance, possesses at its two ends a certain number of nutritive globules floating in the liquid which occupies the whole cavity. The free-swimming existence of the larva is short, and it soon fixes itself by its broader end, which is carried in front when swimming. The narrower end becomes gradually depressed, forms at first an ectodermic plate, in the middle of which there often rises a knob representing the extremity of the larva ; then it becomes invaginated, to form the œsophageal sac, the bottom of which has to become perforated to place the mesenteric cavity in communication with the exterior. In *Clavularia petricola*, we see as many as twenty-six primitive dissepiments at the bottom of the mesenteric cavity, their axes being formed by conjunctive streaks attached to the base of the ectoderm. It is only at the moment when the mouth is formed, that these dissepiments become regular ; eight of them grow rapidly, to join the œsophagus, while the others become gradually obliterated.

24. Marion, A. F. The *Alcyonaria* of the Bay of Naples. Ann. N. H. (5) p. 406.

25. ——. Les Alcyonaires du golfe de Marseille. C. R. xciv. p.

26. ——. Actinaires atlantiques des dragages de l'aviso 'le T... *L. c.* p. 458.

27. Marshall, A. M. & W. P. Report on the Oban *Pennatulida*. Birmingham: 1882, 77 pp., 4 pls.

The authors describe in some detail the anatomy of *Funiculina quadrangularis*, *Pennatula phosphorea*, and *Virgularia mirabilis*, together with the bibliography, geographical distribution, and habits of each genus.

28. Meyer, G. Rugose Korallen aus ost- und westpreussische Diluvialgeschiebe. Schr. Ges. Königsb. xxii. p. 97, pl. Abstr. in Neues JB. Mineral. i. p. 313.

29. Moseley, H. N. Precious Coral. Nature, xxv. p. 510.

This article contains a letter on the coral fishery of Sicily and Italy, and an inquiry as to the occurrence of the precious coral in Japan. [See Giglioli (8)].

30. ——. Notes on the structure of *Seriatopora*, *Pocillopora*, *Corallium*, and *Tubipora*. Q. J. Micr. Sci. lxxxviii. p. 391.

A re-examination of the structure of *Seriatopora* clearly proves that it is Madreporarian. The polyps bear twelve short tentacles with rounded knobs in two series. The cavities of the polyps are in communication by means of a canal system, forming a network which traverses the entire area at the surface between the polyps. The polyps in both *Seriatopora* and *Pocillopora* possess only a single pair of long mesenterial filaments, and these belong to the central mesenteries of the lateral chambers. Both the genera differ from other *Madreporaria* in not having their mesenteries disposed in pairs. The polyps in each stock are arranged with regularity, with the dorsal ends of their oval calices turned towards the tips of the branches, and their longer axes parallel to the lengths of the branches, in this respect agreeing with the Alcyonarians. In *Corallium*, the author has noticed that the dorsal and ventral mesenteries are longer than the lateral in the small polyps which are found in the cœnenchym between the larger ones. They are also devoid of tentacles, and consequently correspond with the siphonozooids of *Sarcophyton* and other dimorphic Alcyonarians. In *Tubipora*, the axial internal tubes are exceedingly irregular; sometimes one infundibuliform tube is lodged within another in a manner similar to that in *Syringopora*, sometimes they give off radial offshoots having somewhat the appearance of septa.

31. Pollock, W. H., with an addendum by Romanes, G. J. On indications of the sense of smell in *Actinia*. J. L. S. xvi. p. 474; abstr. in J. R. Micr. Soc. (2) ii. p. 635.

The animals were capable of distinguishing when food was placed near them, but could not tell in what direction it was, unless placed quite close to them.

32. Pratz, E. Ueber die verwandschaftlichen Beziehungen einiger Korallen Gattungen. Palæontographica, xxix. 2, p. 81.

Rein, J. Die Bermudas Inseln und ihre Korallenriffe, nebst einem Nachtrage gegen die Darwins'che Senkungstheorie. Verhandlungen ersten Deutschen Geographentags. Berlin: 1881. Abstr. in Zool. xxiii. p. 62.

uments urged against the Darwinian theory are—1. That sub-

sidence is rarely met with in these islands. 2. In the Pelew Islands, as proved by Semper, all forms of reefs are met with, and at the same time strong evidences of recent upheavals. 3. In no geological formations are coral reefs met with of the thickness requisite for a belief in the subsidence theory; and finally, the submerged mountains which the atolls, &c., are supposed to crown, are not in all cases to be found.

34. Ridley, S. O. On the Arrangement of the *Coralliidæ*, with descriptions of new and rare species. P. Z. S. 1882, p. 221.

35. ——. Contributions to the Knowledge of the *Alcyonaria*, with descriptions of new species from the Indian Ocean and the Bay of Bengal. Ann. N. H. (5) ix. p. 184, x. p. 125.

36. Schlüter, Cl. Bau von *Callopora eifelensis* und *Spongophyllum semiseptatum* unter Vorlegung von Dünnschliffen. Ueber *Favosites bimuratus* und *Romeria infundibulifera*. SB. Ver. Rheinl. xxxviii. pp. 74 & 75.

37. ——. Ueber einige Anthozoen aus Devon. Verh. Ver. Rheinl. xxxviii. pp. 189–233, pls. ii.–ix.

Contains accounts of following corals:—*Calophyllum paucilabatum*, *Darwinia rhenana*, *Heliophyllum*, *Spongophyllum*, *Acervularia*, and *Fasciculatia*.

38. ——. Ueber das angebliche Vorkommen der Gattung *Lithostrotion*. SB. Ver. Rheinl. xxxviii. p. 91.

39. ——. Ueber *Darwinia perampla*, sp. n, aus dem Mitteldevon. *L. c.* p. 143.

41. ——. Neue Korallen des Mitteldevon der Eifel. *Op. cit.* xxxix. p. 205.

41. Solger, B. Ueber wichtigere Lebenserscheinungen bei *Actinien* und verwanten Formen, sowie über einige diesen Tiere eigentumliche chemische Körpe. Biol. Centrabl. ii. p. 399. Abstr. in J. R. Micr. Soc. (2) ii. p. 794.

In *Sagartia* and *Anthea* a tryptic enzyma was dissolved out of the mesenterial filaments by water; in *Cerianthus* a peptic one. The anal pore, when present, does not serve for the purpose of the discharge of fæcal matter, but for that of the generative products and the expulsion of water.

42. Thomson, J. On a new Family of Rugose Corals, including the Genera *Cyclophyllum*, *Aulophyllum*, and on the genus *Clisiophyllum*. P. Phil. Soc. Glasg. xiii. [1881–82] pp. 471–551, pls. i.–vii.

The form and structure of the two genera *Cyclophyllum* and *Aulophyllum* are so different from all other groups of corals, that the author considers it necessary to separate them under a new family, which he proposes to call *Diplocyathophyllidæ*. The double cup and septal system around the inner margin of the inner cup suggest the probability that these septa are the expression of a double circlet of tentacles, and from the strength of this the author figures a restoration of the genus *Cyclophyllum*.

43. Wright, Bryce. On some new species of Coral. Ann. N. H. (5) ix. p. 73.

44. Wilson, E. B. Animal polymorphism. John Hopkins' University Circulars, May, 1882, p. 203; and in Ann. N. H. (5) x. p. 416.

The author refers to the dimorphism in the *Pennatulida*, and says the zooids are not degenerate polyps, but new formations which have inherited certain peculiarities from the sexual polyps.

45. ——. Variation in the Yolk-cleavage of *Renilla*. Zool. Anz. v. p. 545.

46. ——. The Development of *Renilla*. Abstr. in P. R. Soc. xxxiv. p. 384.

As in other *Alcyonaria*, *Renilla* is dioecious, and fertilization takes place in the water after the discharge of the generative elements. The division of the vitellus is apparently extremely variable, being at times regular, at times regularly meroblastic, and at others exceedingly irregular and unequal. The layers are differentiated by delamination. The radial septa and the horizontal or peduncular septum differ widely in structure and mode of origin. The former arise simultaneously at the anterior end and grow backwards. Each septum consists of two layers of endoderm cells separated by a structureless lamella. The peduncular septum arises at the posterior end, and grows backwards. It is composed of three layers of endoderm cells, the middle of which atrophies. The septa have a very marked bilateral arrangement. The dorsal pair of mesenterial filaments arise last and develops most slowly. The spicules developed in the interior of the cells are of two kinds, ectodermic and endodermic. The colony is produced by budding from the axial polyp. In the buds there is no trace of a peduncular septum and the mesenterial filaments appear in a different sequence. The buds to form sexual polyps always appear in symmetrically placed pairs. The zooids develope in the same manner as the polyps, and are indistinguishable from the latter in the earlier stages. The "Hauptzooid" is a bud of the axial polyp. Finally, the author considers *Renilla* to be related to the *Bathyptileæ* and not to the *Penniformes*.

New genera and species:—

POLYACTINIÆ.

Actinaria.

Hertwig (10) describes the following:—

Antheomorpha, g. n. Belonging to the new family *Antheomorphidæ*, which is distinguished from the family *Corallimorphidæ* by the absence of the intermediate secondary tentacles; *Antheomorpha* itself embraces those *Corallimorphidæ* with a corona of tentacles placed in a single row; tentacles of different sizes decreasing according to the orders; wall smooth.

ns (p. 30), 35° 22′ N. lat., 169° 53′ E. long., 2900 fath.

bunodiformis (p. 35), Tristan da Cunha.

Leiotealia, g. n. (p. 37). *Tealiidæ* with smooth body, without warts and without spherules, but with longitudinal furrows corresponding with the insertions of the septa; tentacles of equal size, arranged in several rows. *L. nymphæa* = *A. nymphæa* (Dana).

Paractis excavata (p. 41), 33° 42′ S. lat., 78° 18′ W. long., depth 1375 fath.

Dysactis crassicornis (p. 44), 53° 38′ S. lat., 70° 56′ W. long., depth 10–15 fath., and 52° 20′ S. lat., 68° W. long., depth 55 fath.

Tealidium, g. n. *Paractidæ*, having the tentacles placed in several rows and of uniform size in the same row, and having the wall covered with fine papillæ. *T. cingulatum* (p. 51), 50° 1′ S. lat., 123° 4′ E. long., depth 1800 fath.

Antholoba, g. n. (p. 53), = *Metridium* (M.-E.) pt. *Paractidæ*, with innumerable small tentacles, which lie on a swollen thickening of the margin of the disk; margin of the disk lobed as in *Metridium*. *A. reticulata* = *Actinia reticulata* (Couthouy) = *Metridium reticulatum* (Milne-Edwards).

Ophiodiscus, g. n. *Paractidæ* with a single corona of long tentacles, which project at the margin of the wall and oral disk, and are only furnished with muscles on the upper side; wall smooth, with longitudinal furrows, indicating the insertions of the septa; septa differentiated into muscular and reproductive; the animals do not appear to draw the oral disk over the mouth, though a mesodermal muscle is present. *O. annulatus* (p. 57), 33° 31′ S. lat., 74° 43′ W. long., depth 2160 fath.; *O. sulcatus* (p. 61), 33° 42′ S. lat., 78° 18′ W. long., depth 1375 fath.

Liponemidæ: a new family including *Hexactiniæ* with numerous perfect septa, and with marginal tentacles transformed by retrograde formation into short tubes or stomidia.

Polysiphonia, g. n.: *Liponemidæ* with tentacles transformed into short tubes with wide terminal mouths; circular muscle mesodermal, slightly developed. *P. tuberosa* (p. 63), 34° 7′ N. lat., 138° E. long., depth 565 fath.

Polystomidium, g. n.: *Liponemidæ* with longitudinal furrows and marginal spherules on the walls; tentacles transformed into stomidia; circular muscle sendodermal. *P. patens* (p. 67), 38° 6′ S. lat., 88° 2′ W. long., depth 1825 fath.

Cereus spinosus (p. 76), 53° 55′ S. lat., 108° 35′ E. long., depth 1950 fath., and 34° 37′ N. lat., 140° 32′ E. long., depth 1875 fath.

Phellia pectinata (p. 81), 49° 24′ S. lat., 74° 23′ W. long., depth 147 fath.

Bunodes minuta (p. 84), 46° 16′ S. lat., 48° 27′ E. long., depth 1600 fath.

Amphianthidæ (p. 86). A new family containing *Hexactiniæ* which are attached to the stems of *Gorgoniidæ* with shortened sagittal and elongated transverse axis; transverse axis lying parallel to the axial skeleton of the *Gorgonia*; circular muscle mesodermal, the principal septa only perf[ect] and sterile.

Stephanactis, g. n.: *Amphianthidæ* with firm wall, divided [by] circular swelling into an upper and a lower section decre[asing] size from within outwards. *S. tuberculata* (p. 88), 35° 1[7′]

139° 28′ E. long., depth 345 fath. *S. abyssicola* = *Actinia abyssicola* (Moseley).

Amphianthus, g. n. *Amphianthidæ* with a firm wall, which is covered with fine papillæ, but not divided into two sections by a circular swelling. *A. bathybium* [*-ius*] (p. 91), 35° 41′ N. lat., 157° 42′ E. long., depth 2300 fath.

Sicyonidæ (p. 97). A new family composed of sessile *Paractiniæ*, with tetramerous arrangement of the septa; circular muscle mesodermal; tentacles transformed by retrograde metamorphosis into small knob-like stumps. *Sicyonis*, g. n.: *Sicyonidæ* with discoid flattened body, smooth wall, and alternating reproductive septa and muscular septa. *S. crassa* (p. 98), 46° 16′ S. lat., 48° 27′ E. long., depth 1600 fath.

Polyopidæ. A new family composed of *Paractiniæ* without pedal disk, posterior end of the body round and saccular, with aboral opening (?); tentacles transformed into stomidia by retrograde metamorphosis. *Polyopis*, g. n.: *Polyopidæ* with smooth wall, the surface having longitudinal furrows indicating the position of the septa; circular muscle wanting. *P. striata* (p. 101), 33° 31′ S. lat., 74° 43′ W. long., depth 2160 fath.

Scytophorus, g. n. The representative of a new family *Monaulidæ*, and tribe *Monauleæ*. Sessile *Monaulidæ*, with seven pairs of septa, and fourteen longitudinal furrows on the wall; the wall covered with a tough cuticle; no circular muscle; tentacles fourteen in number, of medium size, arranged in a single circle. *S. striatus* (p. 104), 52° 4′ S. lat., 71° 22′ E. long., depth 150 fath.

Sphenopus arenaceus (p. 120), Cape York.

Porponia, g. n. Actiniaria with two œsophageal grooves, without circular muscle, with thin walled tentacles, the bases of which are supported on the outer side by clasp-like prolongations of the wall. *P. elongata* (p. 125), 42° 42′ S. lat., 134° 10′ E. long., depth 2600 fath. *P. robusta* (p. 127), 34° 37′ N. lat., 140° 32′ E. long., depth 1875 fath.

Clutonactis richardi, Marion (26), Bay of Biscay.

Palythoa glomerata, *P. eupaguri*, Marion (26), Bay of Biscay; *P. senegambiensis*, Carter (2), Coast of Senegambia.

Edwardsia flaccida, *E. scabra*, *E. rigida*, Marion (26), Bay of Biscay.

MADREPORARIA.

Poritidæ.

Somphophora, g. n. Polyparium composite; calyx polygonal; walls thick; six septa, which end in free dentate edges; bases thin. *S. dædala*, Lindstrom, (22).

Eupsammidæ.

...ophyllia brevis, Duncan, (4) p. 219, Madeira.

...a, g. n., Bryce Wright, (43). Corallum simple, irregular in

form, rugose, swollen at the base and contracting towards the calyx; costæ broad, finely punctate, without cross bars; epitheca dense; fossula deep; columella spongious. *B. radians* (p. 77), Southern Seas.

Astræidæ.

Koby (15) describes the following new species:—

Trochosmilia excelsa (p. 23), St. Ursanne; *T. inflata* (p. 24), Caquerelle.

Epismilia irregularis (p. 27), Soyhières, &c.; *E. laufonensis* (p. 28), Soyhières, &c.; *E. contorta* (p 29), Soyhières, &c.; *E. multisepta* (p. 30), Soyhières, &c.; *E. crassisepta* (p. 31), St. Ursanne; *E. magna* (p. 32), St. Ursanne; *E. delemontana* (p. 32), Caquerelle.

Plesiosmilia gracilis (p. 34), Combe Chavatte; *P. truncata* (p. 35), Combe Chavatte; *P. corallina* (p. 36), Combe Chavatte.

Pleurosmilia compressa (p. 39), St. Ursanne; *P. excavata* (p. 40), St. Ursanne; *P. generensis* (p. 40), Salère.

Axosmilia cylindrata (p. 42), Vorbourg.

Rhipidogyra gigantea (p. 45), Caquerelle; *R. minima* (p. 46), Salère.

Aplosmilia thurmanni (p. 54), Caquerelle.

Stylosmilia corallina (p. 62), St. Ursanne, &c.

Heliocœnia costulata (p. 64), Vorbourg; *H. etalloni* (p. 64), Soyhières; *H. corallina* (p. 65), Caquerelle, &c.

Diplocœnia matheyi (p. 70), Caquerelle, &c.; *D. polymorpha* (p. 70), Soyhières.

Stylina renevieri (p. 74), Sainte Croix; *S. subramosa* (p. 79), Soyhières; *S. fenestralis* (p. 83), Vorbourg; *S. punctata* (p. 85), Sainte Croix.

Cryptocœnia thiessingi (p. 86), Combe Chavatte; *C. compressa* (p. 87), Boltigen; *C. cartieri* (p. 89), Gunsberg, &c.; *C. tabulata* (p. 93), Sainte-Claude, &c.

Cyathophora thurmanni (p. 96), Caquerelle, &c.; *C. gressleyi* (p. 98), Caquerelle, &c.; *C. faveolata* (p. 100), Obergösgen.

Convexastræa meriani (p. 102), St. Ursanne; *C. buschmanni* (p. 103), Boltigen.

Oculinidæ.

Enallohelia decussata, Koby, (15) p. 18, Valfin.

Dendrohelia mamillaris, Koby, (15) p. 21, Soyhières.

Turbinolidæ.

Caryophyllia endothecata, Duncan, (4) p. 216, Madeira.

Ceratotrochus johnsoni, Duncan, (4) p. 217, Madeira.

Trochocyathus corallinus, Koby, (15) p. 13, Soyhières.

OCTACTINIÆ.

Stolonifera.

Clavularia prolifera, Koch, (16).

Alcyonidæ.

Nephthya burmaensis, Ridley, (35) p. 185, British Burma.
Corallium stylasteroides, Ridley, (34) p. 225, Mauritius, 75 fath.

Gorgonidæ.

Villogorgia mauritiensis, Ridley, (35) p. 189, Mauritius, 80 fath.
Acis orientalis, Ridley, (35 ii.) p. 126, Mauritius, 80 fath.
Muricea echinata, Koch, (21) p. 541; *M. chamæleon* (p. 542); *M. kœllikeri* (p. 543), *M. macrospina* (p. 544), Naples.
Muricella perramosa, Ridley, (35 ii.) p. 128, Mauritius, 90 fath.
Eunicella pergamentacea, Ridley, (35 ii.) p. 129, = *Gorgonia viminalis*, Esper., Mediterranean.
Gorgonella bianci, Koch, (21) p. 546, Naples.
Verrucella candida, Ridley, (35) p. 192, Mauritius, 90 fath.
Parisis mauritiensis, Ridley, (35 ii.) p. 131, Mauritius, 80 fath.

TETRACORALLA.

Inexpleta.

Petrœa incurva, Schlüter, (40) p. 209, Eifel.
Cyathophyllum pachyphylloides, p. 64, and *C. densum*, p. 65, Lindstrom, (22) Tshan-tiën.

Expleta.

Acanthodes borussicus, Meyer (28).
Amplexus viduus, Lindstrom, (22) p. 62; *A. distans* (p. 63); *A. appendiculatus* (p. 63), Tshan-tiën.
Ptychophyllum richthofeni, Lindstrom, (22) p. 65; *P. cyathiformis* (p. 67), Tshan-tiën.
Darwinia perampla, Schlüter, (39).
Spongophylloides schumanni, g. & sp. nn., Meyer, (28). Allied to *Spongophyllum*, and remarkable for the slight development of the septa.
Ceriaster, g. n. Polyparium composite; septa nine to twelve, thin, and reaching to the middle; columella absent; dissepiments scarce, and composed of horizontal, slightly built scaly plates. Allied to *Stauria*. *C. calamites*, Lindstrom, (22) p. 61, Tshan-tiën.
Actinocystis cristata, Schlüter, (40) p. 206, Berndorf; *A. lissingensis* (p. 206), Gerolstein; *A. cylindrica* (p. 206), Gerolstein; *A. looghensis* (p. 207), Loogh; *A. maxima* (p. 207), Eifel; *A. defecta* (p. 208), Berndorf.
Cystiphyllum cæspitosum, Schlüter, (40) p. 209; *Microplasma fractum*, Stüder, (40) p. 209, Urft.

Platyphyllum, g. n. The surface is swollen; the circumference of the calyx is elliptical in section; primary septa with deep septal foramina; the inner structure is seen in longitudinal section to be composed of plates perforated by foramina. *P. sinense*, Lindstrom, (22) p. 68.

J. THOMSON, (42) describes the following new species:—

Diplocyathophyllidæ, fam. nov. Corallum simple; septa well-developed, and extending inwards for about a third of the total diameter of the corallum; septal fossula variable; columella tubular. The longitudinal section presents the form of a double cup at the superior extremity (p. 477).

Cyclophyllum ureanum (p. 482), Petershill Quarry, Bathgate; *C. biacuminatum* (p. 485), Roughwood Quarry, Beith; *C. pachyendothecum* (p. 487), Brockley; *C. obovatum* (p. 487), Trearn Quarry, Beith; *C. scoulerianum* (p. 488), Brockley; *C. duncanianum* (p. 489), Brockley; *C. ellipticum* (p. 490), Roughwood Quarry, Beith; *C. orbiculum* (p. 490), Trearn Quarry, Beith; *C. carpenterianum* (p. 491), Poneil Water, Brockley; *C. bennieanum* (p. 493), Roughwood Quarry, Beith; *C. m[ac]kendrickianum* (p. 494), Petershill Quarry, Bathgate; *C. curvilineare* (p. 496), Petershill, Bathgate; *C. concentricum* (p. 497), Gameshill Quarry, Dunlop; *C. cylindricum* (p. 498), Petershill Quarry, Bathgate; *C. frondicum* (p. 499), Cateraig, Dunbar; *C. tortuosum* (p. 449), Petershill Quarry, Bathgate; *C. paradoxacum* (p. 500), Brockley; *C. intermedium* (p. 501), Nettlehurst Quarry, Beith; *C. radianum* (p. 502), Petershill Quarry, Bathgate; *C. moseleyanum* (p. 503), Trearn Quarry, Beith; *C. vesicularum* (p. 504), Petershill Quarry, Bathgate.

Aulophyllum patrickianum (p. 508), Langside Quarry, Beith; *A. edwardsianum* (p. 511), Brockley; *A. haimeianum* (p. 512), Brockley; *A. wuenschianum* (p. 513), Cock at Arran; *A. impingeum* (p. 514), Petershill Quarry, Bathgate; *A. expansum* (p. 515), Charleston Quarry, Fifeshire.

Family CYATHOPHYLLIDIA.

Clisiophyllum oblongum (p. 524), Roughwood Quarry, Beith; *C. danaianum* [named after Dana !] (p. 525), Charleston Quarry, Fifeshire; *C. densiphyllum* (p. 530), Petershill Quarry, Bathgate; *C. grandicum* (p. 531), Langside Quarry, Beith; *C. broadstonianum* (p. 532), Broadstone Quarry, Beith; *C. genitzianum* [in honour of Prof. Gintzio !] (p. 533), Broadstone Quarry, Beith; *C. elegante* [!] (p. 534); Broadstone Quarry, Beith; *C. abruptum* (p. 535), Gateside Quarry, Beith; *C. vesicularum* (p. 537), Langside Quarry, Beith; *C. intermedium* (p. 538), Auchenskeoch Quarry, Dalry; *C. subimbricatum* (p. 540), Broadstone Quarry, Beith; *C. irregulare* (p. 542), Broadstone Quarry, Beith; *C. subplicatum* (p. 543), Broadstone Quarry, Beith; *C. centrocellulosum* (p. 544), Gateside Quarry, Beith.

SPONGIIDA.

BY

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CHIEF WORKS ON RECENT SPONGES.

1. BOWERBANK, J. S. A Monograph of the British *Spongiadæ*; edited, with additions, by the Rev. A. M. Norman. Vol. iv. (supplementary). London: 8vo (Ray Society), 17 pls.

This work contains a classified list of British Sponges, with minute subdivisions of the genera, and descriptions of 35 species regarded as new by Bowerbank. The whole of the known British species recognized by that author are enumerated, with references and notes added in many instances by him, and also by the Editor, who gives tables of their vertical and horizontal distribution within the British Isles, and an appendix dealing with the described British species not recognized or referred to by Bowerbank in his "Monograph," also a comprehensive list of previous works on Sponges. Only the more important of the synonymical changes are given below.

2. CARTER, H. J. Some Sponges from the West Indies and Acapulco, in the Liverpool Free Museum, described, with general and classificatory remarks. Ann. N. H. (5) ix. pp. 266 & 346, pls. xi. & xii.

Describes a number of Sponges of various Orders from various localities, and gives a classified list of many of the typical *Suberitidæ*, with short distinguishing characters.

3. ——. Form and Nature of the Cirrous Appendages on the Statoblast of *Carterella latitenta*, Potts, &c., originally designated "*Spongiophaga pottsi*." Tom. cit. p. 390, pl. xiv.

The appendages are not *Spongiophaga*, but apparently in some way analogous to it.

——. New Sponges, Observations on old ones, and a proposed new Group. *Op. cit.* x. p. 106, 2 woodcuts.

. Spermatozoa, Polygonal Cell-structure, and the Green ur in *Spongilla*, together with a new Species. *Tom. cit.* p. 362, vi.

6. Dybowski, W. Studien über die Süsswasser-schwämme des Russischen Reichs. Mém. Pétersb. (7) xxx. No. x. pls. i.–iii.

A detailed account of 5 species of Russian *Spongillidæ* known to the author. The 12 nominal species of European *Spongillidæ* are reduced to 5, and a list of 84 works on the group is appended.

7. Graeffe, E. Uebersicht der Seethierfauna des Golfes von Triest nebst Notizen über Vorkommen, Lebensweise, Erscheinungs- und Fortpflanzungs-zeit der einzelnen Arten. II. Cœlenteraten. Spongiariæ. Arb. z. Inst. Wien. iv. p. 313.

Notes on the habits of Sponges generally, and of 45 species found at Triest in particular; the localities of the Sponges near Triest, the habitats of eggs and larvæ, and the period of reproduction, are given where known.

8. Hyatt, J. D. The Boring Sponge: Does it excavate the Burrows in which it is found? Am. Micr. J. iii. p. 81, 3 woodcuts.

9. Krukenberg, C. F. W. Vergleichend-Physiologische Studien. Experimentelle Untersuchungen. Zweite Reihe. Dritte Abtheilung. Heidelberg: 1882, 8vo, 9 tables of spectra.

Under the heading "Die Pigmente, ihre Eigenschaften, ihre Genese, und ihre Metamorphosen bei den Wirbellosen Thieren," this deals with sundry pigments found in *Invertebrata*; those described in Sponges are floridine, uranidine, and lipochrome. Floridine appears only to occur in those Sponges which yield a violet to purplish-red tint to the naked eye. At p. 60, a useful table is given of the chief reactions of those animal pigments which are alterable by ferments. For results, see below, *Aplysina aerophoba*, *Hircinia variabilis*, *Reniera*, and General Anatomy and Physiology.

10. Lankester, E. R. On the Chlorophyll-corpuscules and Amyloid Deposits of *Spongilla* and *Hydra*. Q. J. Micr. Sci. xxii. p. 229, pl. xx.

The author finds that the green pigment of *Spongilla* is contained in specific chlorophyll-corpuscules, which are of the same nature as those of plants, and are formed by the protoplasm of the cells in which they occur; an amyloid substance was also found in a vacuole which occurs in the sponge-cell. Facts and arguments are adduced in opposition to Brandt's views on this subject; see below, *Spongilla fluviatilis*. See also *id.* Nature, xxvii. p. 88.

11. Lendenfeld, R. v. Das Hornfaserwachsthum der *Aplysinidæ*. Zool. Anz. v. p. 634.

12. Marshall, W. Die Ontogenie von *Reniera filigrana*, O. Schm. Z. wiss. Zool. xxxvii. p. 221, pls. xiii. & xiv.

A detailed description of the development. The author argues in favour of the Cœlenterate affinities of the Sponges, concluding with the statement that *Porifera* and *Telifera* are two diverging branches of a Cœlenterate stem, which have been developed from the stem-form *Actinia*, common to both.

13. Noll, F. C. Mein Seewasser-Aquarium. Zool. Gart. xxii. [1881] pp. 33, 71, 137, 168, & 194.

Notes on Sponges in the living state.

Norman, A. M. [See Bowerbank, J. S.]

14. Potts, E. Three more Fresh-water Sponges. P. Ac. Philad. 1882, p. 12.

15. Sollas, W. J. The Sponge-Fauna of Norway; a Report on the Rev. A. M. Norman's Collection of Sponges from the Norwegian Coast. Ann. N. H. (5) ix. pp. 141 & 426, pls. vi., vii., & xvii.

Continues the description of the *Tetractinellida* [see Zool. Rec. xvii.] by a minute anatomical and histological study of three species, *Pachymatisma johnstonia*, *Tetilla cranium*, *Thenea wallichi*.

16. Vosmaer, G. C. J. Voorloopig Berigt omtrent het onderzoek door den ondergeteekende aan de Nederlandsche werktafel in het Zoölogisch Station te Napels verrigt, 20 November, 1880, –20 Februarij, 1881. Nederlandsche Staatscourant, 1881, No. 109, 6 pp.

A short account of results of three months' work at Sponges at Naples.

17. ——. Report on the Sponges dredged up in the Arctic Sea by the 'Willem Barents' in the years 1878 & 1879. Niederl. Arch. Zool., Suppl.-Band i. Lief. 3, pls. i.-iv.

All the species are figured. In some cases, an account is given of the canal system. The spicules are very fully treated. The author distinguishes between specifically and generically important spicules and those which are not indispensable to the characters of the species.

Weltner, W. Beiträge zur Kenntniss der Spongien. Inaugural Dissertation. Freiburg in Baden: 1882, 8vo, 62 pp. 3 pls.

[Not seen by the Recorder.]

W. Dybowski. Einige Bemerkungen über die Veränderlichkeit der Form und Gestalt von *Lubomirskia baicalensis* und über die Verbreitung der Baikalschwämme im Allgemeine. Mél. biol. xi. [1881] p. 41. Essentially the same as the paper by the same author recorded Zool. Rec. xviii. *Spong.* p. 6, *ad init.*

K. Franks & P. S. Abraham on so-called Sponge-grafting, J. Anat. Phys. xvii. p. 349, give accounts of this operation, which consists in implanting pieces of officinal Sponge in the tissues of the human body, to be overgrown by them.

G. Brown Goode. List of Sponges, with localities, given in Catalogue of Objects Illustrating Resources and Fisheries of the United States; Bull. U. S. Nat. Mus. 1882, No. 14, p. 263.

W. J. Sollas. The Group *Spongiæ*, in Cassell's Natural History, edited by P. M. Duncan; London, 4to, vol. vi. pp. 312–331, 1 pl., 17 woodcuts. A general account of the group, its leading forms, the outlines of their anatomy and development; the illustrations are taken from various

works, and are selected so as to give a good general insight into the subject.

G. C. J. VOSMAER: *Porifera*, in Bronn's Klassen und Ordnungen des Thierreichs, Leipzig and Heidelberg, vol. ii. Lief. i. 1882, pp. 1–32, pls. i., ii., & iv. This, the first part of the revised edition, discusses the origin of the names applied to the group, gives a list of the chief works relating to Sponges, and commences an abstract of the substance of the leading writings.

F. E. SCHULZE, "Der Badeschwamm," in Westermann's Illustrirte Deutsche Monatshefte, 1882, pp. 188–210, illustrated by 15 woodcuts. He describes the commercial varieties of Sponge and their distribution, and the structure, physiology, and development of the officinal Sponges, discusses the vegetable theory of the affinity of Sponges, and advocates the view that a "person" is represented by each oscular opening; he describes also the fishery and preparation for the market, and the attempts made to cultivate Sponges artificially.

"Ueber den Badeschwamm" (Graz: 1882, 8vo, 6 pp.), a lecture delivered before the Society for Natural Sciences of Styria, by the same author, deals with the same subject more briefly.

Microscopic fungus discolouring and damaging officinal Sponges during use, described by J. DUFOUR, Bull. Soc. Vaud. (2) xvii. p. 144, and named *Torula spongicola*; phenic and salicylic acid and boiling water are recommended as remedies.

Use of subchloride of potassium, called Eau de Javelle, recommended for preparation of the skeleton of a sponge (*Spongilla*) by F. C. Noll, Zool. Anz. v. p. 528.

FAUNÆ.

FRESH-WATER.

Sardinia. Fresh-water Sponge from a stream, briefly described by A. COSTA, Rend. Acc. Nap. xxi. p. 191, without name.

Russia. 5 species of *Spongillidæ*, including a new *Spongilla*, and 3 unnamed *Meyeniæ*, described by DYBOWSKI (6).

North America. Account of *Spongillidæ* from the Buffalo River (U.S.), by H. MILLS, reported from Bull. Buff. Soc. in the "Microscope and its relation to Medicine and Pharmacy" (Ann Arbor, Michigan), ii. p. 28; they include *Spongilla asperrima*, *S. ottawaensis*, Dawson, *S. fragilis*, *Carterella tubisperma*, and two other species [see also POTTS].

Australia. 2 new species of *Spongilla* and 1 of *Meyenia* described from New South Wales by HASWELL [see *infrà*].

New Guinea. From Lake Kamaka Vallar, with temperature of 31° Cels., an alleged new form of Sponge, of Halichondrioid affinities, recorded by Miklucho-Maclay before the Russian Geographical Society; Nature, xxvii. p. 138.

MARINE.

Arctic Sea. 25 Sponges, including 9 new *Silicea*, described by VOSMAER (17), from the 'Willem Barents,' from the W. and N.W. and N. Norwegian coasts, the Barents Sea, and Novaja Zemlya. Spicules of *Hex-*

actinellida occurred as foreign bodies in Geodine Sponges from near Hammerfest.

Sponge from Arctic America briefly described without name by A. E. Verrill, Bull. U. S. Nat. Mus. No. 15, p. 153.

North Sea. *Chalinula fertilis*, Keller ?, and *Halichondria panicea*, recorded by G. C. J. Vosmaer, Tijdschr. Nederl. Dierk. Ver. vi. p. lii., from Southern Holland.

Norway. Notes on the *Invertebrata* of the fiords by E. R. Lankester, Nature, xxvi. p. 478, including 4 Sponges, among which appears *Asbestopluma*, g. n. (Norman, MS.), without further description.

North Atlantic. The Sponges obtained by the 'Knight-Errant' in 1880, between Scotland and the Færöe Islands, are stated by F. E. Schulze, P. R. Soc. Edinb. 1881–2, p. 71 (sep. copy), to consist of *Tisiphonia agariciformis*, *Reniera* (sens. lat.), sp. n., *Tetilla cranium*, and *Stylorrhiza stipitata*, besides spicules of what was probably *Holtenia*.

Lists including 5 Sponges collected by the U. S. Fish Commission off the New England coast, by R. Rathbun, P. U. S. Nat. Mus. iv. pp. 303 & 307.

Mediterranean. List of upwards of 100 species from the Bay of Naples given by Vosmaer (16), including several unnamed representatives of new genera or species, and two to which MS. names have been assigned by O. Schmidt; also one Hexactinellid and two or three *Lithistidæ*.

C. Keller, N. Denk. schw. Ges. xxviii. pt. 3, is reported in Nature, xxvi. p. 42, as describing a violet-coloured Sponge belonging to the Bitter Lakes, Suez Canal, as being in process of migration towards the Mediterranean.

Sponge figured and described without name as boring into colonies of *Cladocora* at Triest, by A. von Heider, SB. Ak. Wien, lxxxiv. Abth. i. p. 664, pl. iv. figs. 38 & 39.

West Indies. 35 Sponges described by Carter (2) from collections made on the yacht 'Argo' in 1876–77.

West Africa. T. Studer mentions, Zool. Anz. v. p. 354, as taken by the 'Gazelle' at depths of over 100 fath., between 11° S. lat. and 15° N. lat., and 18° and 24° W. long., *Tisiphonia fenestrata* ?, *Stylorrhiza stipitata* ?, and another Sponge; in 150 fath. *Farrea* and stalked *Suberitidæ* were obtained.

Equatorial Pacific. 4 Sponges described by Carter (2) from Acapulco, W. Mexico.

Classification.

Tetractinellida. Sollas (15) gives tables illustrating his views of the relations of the groups composing this Order, one of which is as follows:—

Tetractinellida { Completa { *Lithistidæ* / *Scolopidæ* (*Dercitus*, &c.) } / Externa { *Corticata* / *Leptochrota* } } *Choristidæ*.

GENERA, SPECIES, &c., REFERRED TO.

CARNOSA.

Halisarca lobularis, Schmidt. G. C. J. Vosmaer, Biol. Centralbl. i. p. 103 [1881], believes Braun right in upholding its hermaphroditism, and considers that the opinion expressed by the same author, that one and the same diœcious species of Sponge can occasionally become hermaphrodite, is plausible, and that the argument derived from a similar occurrence in *Tubularia* is apposite.

CERATOSA.

Aplysina compressa, (2) p. 272; *Spongia fenestrata*, Duchassaing & Michellotti, is an *Aplysina*.

Aplysina aerophoba. Its colouring matter is described by Krukenberg, (9) p. 41, table iii., under the name Uranidine; the dark form which it assumes after death is termed Aplysinonigrin. Rapid treatment of this Sponge discloses in it five different yellow pigments, varying in tint from orange to greenish yellow, viz., (1) Uranidine, also found in *Reniera aquiductus*, *Tedania muggiana*, *Suberites flavus*, *Clathria coralloides*, *Hircinia variabilis*, and *Tethya lyncurium*, and perhaps identical with a hepatic colouring matter widely distributed among *Invertebrata*. It is soluble in alcohol, ether, fatty and ethereal oils, &c.; it is characterized by a broad absorption band between B and C. (2) Also called Uranidine; occurs in *Tedania muggiana*, *Tethya lyncurium*, *Suberites flavus* and *massa*, and many other Sponges. It is distinguished by two absorption bands on or in the neighbourhood of F; solutions are bleached by light with some rapidity; it resembles the yellow colouring matter of the fats of *Vertebrata* in its relations to solvents. (3) Is sometimes extracted from the living Sponge by alcohol, ether, or oil of turpentine, and gives an absorption band near E, about line 14. (4) Is indicated in alcoholic solutions by a band just before D, at about line 11. (5) Aplysinofulvin; has only been discovered with certainty in the *Aplysinidæ* among Sponges. It is soluble in the ordinary solvents, but here, as in the dead tissues of the Sponge, it is rapidly altered into a dark modification, Aplysinonigrin; boiling heat effects this instantaneously. If, however, the Sponge is treated with alcohol made strongly acid by hydrochloric acid, the solution retains the yellow colour for days, and even in presence of heat it exhibits no absorption bands in the spectrum. *Aplysilla sulphurea*, F. E. Schulze, also contains Aplysinofulvin, differing only in the slowness with which it alters its colour. The change of colour in both is due to the destruction, by oxidation, of a ferment whose action is to maintain the pigment in its yellow condition. The lymph of a commensal of *Aplysina aerophoba*, viz., a Tunicate, *Ascidia fumigata*, has a pigment closely resembling Aplysinofulvin in most of its properties, but changing to dull brown instead of brownish yellow when its alcoholic solution is dropped into liquid ammonia, and exhibiting similar differences

in some other reactions. The pigment of *Æthalium septicum* much resembles Aplysinofulvin. That of the skin of *Holothuria poli* is also a form of Uranidine.

The horny fibre of 3 alleged new species from Port Phillip, Glevely, and King George's Sound, in Southern Australia, resembling *Aplysilla*, but not definitely named, is described by R. v. Lendenfeld (11). The fibres increase in thickness with age, but the axial substance is cylindrical in old fibres; in the young fibres it is interrupted by cap-shaped cellular masses of granular appearance. The cells appear to be taken in at the tip of the fibre, multiply within, and act by dissolving away the horny matter, and adding to the axial substance. In one of the species the fibre consists of bundles of fibres, which become invested by a common coat, and eventually acquire a common axial substance. The young fibres of the bundles have no axial substance of their own; full-grown fibre-branches are found to possess one, which is continuous with that of the main fibre.

Spongia officinalis, auctt., from W. Indies. Carter (2) includes the Turkey and honeycomb Sponges under one head, and states that the West Indian and Mediterranean species are identical.

Spongionella pulchella. Some bodies described in it as gemmules or ovaries by Bowerbank, (1) p. 184.

Hircinia variabilis. Rose-coloured pigment is described from it by Krukenberg, (9) p. 30, table ii. spectra 12–17, as a form of Floridine. The watery solution gives an absorption band between D and E (Fraunhofer); on addition of ammonia, a second appears at about C^{11} D; on acidification the bands unite upon D; the alcoholic extract and its evaporated residue, re-dissolved in carbon disulphide, both give a band extending from beyond G to E^{15} F. The substance resembles, but is not identical with, the colouring matter of *Bugula neritina*.

Sarcotragus spinosulus, Schmidt, = *Hircinia*, (7). *Hircinia muscarum*, Schmidt, is also cited; *Sarcotragus muscarum*, id., is evidently the species intended.

Polytherses, Duchassaing & Michellotti, is a *Hircinia* altered by the parasite *Spongiophaga*, according to Carter, (2) p. 274.

Spongeli[i]dæ. New Family established by Vosmaer, (16) p. 5, for *Spongelia* and a new form described without name, but which in form resembles *Siphonochalina*, and the arrangement of whose fibre resembles that of the vascular bundles of twigs and leaf-stalks of many dicotyledonous plants; the ciliated chambers are oval, and lie in the meshes of the skeleton.

SILICEA.

Monactinellida.

Chalinidæ.

Chalina oculata. Its substance found filled with bristles of *Aphrodite*; P. Pelseneer, Ann. mal. Belg. (3) i. [1881] p. clxxiii.

Chalinula fertilis, Keller. Vosmaer, Biol. Centralbl. i. p. 104 [1881], has hitherto been unsuccessful in his search for spermatozoa in

Neapolitan specimens, but found ova in both elongate and massive, yellow and pink specimens.

Chalinula robustior, Schmidt ?, (17) p. 39, pls. i. fig. 23, iii. fig. 113, Barents Sea.

Chalinula sp., (17) p. 40, pl. iv. figs. 148–151, Matosjkin Shar.

Spongia rubens, Pallas, W. Indies and S. Australia, = *Chalina*, according to Carter, (2) p. 276, pl. xi. fig. 7.

Tuba, Duchassaing & Michellotti. Five of these authors' species described by Carter, (2), from W. Indies. *T. lineata*, *digitalis*, *armigera*, l. c. pl. xi. figs. 4–6.

RENIERIDÆ.

Vosmaer (16) finds the canal system in this family to resemble strongly that of *Euplectella*, as described by Schulze. The ciliated chambers are sac-shaped, and always open into broad canals by wide openings.

Reniera. The great variety of coloration found in this genus is remarked upon by Krukenberg, (9) p. 37. A species resembling *R. aquiductus*, found at Triest, owes its pale red or violet colour to a variety of Floridine, which is soluble in sea-water, and is but little altered by acids and alkali, but becomes dull yellow on boiling ; it gives no distinct absorption band in the spectrum. See also *R. purpurea*, sp. n.

Reniera calyx, Schmidt. Carter, (4) p. 124, doubts the correctness of the generic determination of the species, and refers it provisionally to his new group *Phlæodictyina*.

Reniera filigrana, Schmidt. Described from Corfu by Marshall, (12) p. 221. It is dioecious; the sexual period is August and September. Segmentation is regular ; the ovum largely increases in size during the process ; ultimately a blastula is formed, having a segmentation cavity surrounded by a uni-laminar continuous ectoderm. When the component cells of this blastula reach the number of about 2000, they become elongated and prismatic, and are of equal size in all parts ; the nuclei now lose their granules ; the contents (called "cœnoblast") of the segmentation-cavity also now become dark and granular, and nuclei appear in it ; the granules are probably derived from the ectoderm, and the nuclei are perhaps due to free nucleus-formation. The mature embryo has a round brownish violet spot at the anterior pole. When liberated into the canals of the parent from the egg-capsule, it is, for the first time, seen to possess a covering of cilia, and a ring of special large cilia just behind the pigment spot. During a period of free existence, the larva exhibits amœboid movements, attributed with probability to the action of the cœnoblast ; the ectoderm cells now alternately lose and regain their cilia. Finally, the larva attaches itself by means of amœboid processes of the cœnoblast, which protrudes at the hinder end ; the cilia of the ectoderm disappear, and its cells lose their contours and blend into a continuous mass, containing round nuclei ; the cœnoblast, which has emerged at the anterior pole, shows very active amœboid movements. The sponge rapidly flattens out; the ectoderm loses its nuclei. The cœnoblast is, henceforth, the only part which exhibits important changes ; a little behind its anterior exposure a round flat space

appears, indicating the differentiation here of distinct large-nucleated cells, the ectoderm ; the remainder of the cœnoblast has the appearance of a syncytium, and is interpreted as constituting the mesoderm. The mouth opening is caused by a bursting outwards of the mesoderm. The primitive cavity now pushes out radially, into its walls, four to six hemispherical diverticula, forming a Cœlenterate-like stage, which Marshall names *Protactinia*, in recognition of the significance which he attaches to it ; similar diverticula then appear on the inner surface of the whole upper side, and are constricted off until they are left connected by but narrow passages with the body-cavity ; they then become connected with the exterior by the evagination from them of narrow canals, several of which unite with each other ; the common channel thus formed opens on the surface by a pore formed by the extrusion of a plug of mesoderm ; the whole gastrovascular system is lined by entoderm. This layer becomes differentiated from cylindrical into flat polyhedric cells in the passages, and into ciliated cells in the diverticula, which thus become the ciliated chambers. The latter become round instead of hemispherical, lose their original racemose arrangement, and become isolated. The spicules appear at first scattered in the cœnoblast of the anterior end of the free-swimming larvæ as fine siliceous tubes, enclosing soft axes, and always in the neighbourhood of nuclei, although no direct connection with cells was made out ; the differentiation of the form and the regular arrangement of the spicules first appear at the completion of the canal-system, and are stated to result from the organized circulation of water through the sponge. Marshall compares the early history of the cœnoblast with that of the segmentation cavity in *Eucope*. He is inclined to regard the pigment-spot as a primitive sense-organ.

Reniera sp. Its growth and decay described by Noll, (13) p. 173. Specimens assume a flattened shape when growing on the glass of the aquarium, whereas on Corals (*Alcyonaria*?) they project freely.

Thalysias repens, Duch. & Mich., var. n., Carter ; and *T. carbonaria*, (2) pl. xi. figs. 10 & 11.

Isodictya simulo, Bowerbank, renamed *I. bowerbanki* by Norman, (1) p. 128.

Amorphina sp., (17) p. 41, pl. i. fig. 26, Barents Sea.

Amorphina panicea from Travemunde Bay ; H. Lenz, Jahresbericht der Commission zur wissenschaftlichen Untersuchung der deutschen Meere in Kiel, Jahrgang viii.–xi. pt. i. p. 171.

Halichondria panicea from W. Indies, (2) pl. xi. fig. 8.

Tedania suctoria, Schmidt, (17) p. 42, pls. i. fig. 24, iii. figs. 83–88, Barents Sea.

Spongillidæ.

Spongilla. In Am. Micr. J. ii. [1881] p. 236, an account is given of the examination by I. Remsen of specimens of water from the Boston (U.S.) water supply, affected by a taste compared to that of cucumbers ; A. Hyatt, on examination of substances possessing this odour in intensity, and removed from a strainer at the point of exit, identifies them as *S. fluviatilis*.

Spermatozoa in *Spongilla*. Carter, (5) p. 364, pl. xvi. figs. 7 & 8, describes and figures from his journal kept at Bombay, what appear to him to be sperm-balls and spermatozoa of *Spongilla alba*.

Polygonal cell-structure in *Spongilla*. Carter, (5) p. 366, calls attention to this as occurring in the gemmule of *S. carteri*, *S. nitens*, and *S. lordi*, var. *segregata*, pl. xvi. figs. 9–11, in which the gemmule is quadrilocular.

Spongilla chlorophyll-corpuscles stated to have rendered chlorophyll-less specimens of *Stentor* green; Brandt, Arch. für Anat. Phys. 1882, pp. 125 *et seq.*, 1 pl. "Ueber die morphologische und physiologische Bedeutung des Chlorophylls bei Thieren"; the fragments of living *Spongilla* were taken in by the Infusorian, but not digested. G. Entz, Biol. Centralbl. ii. p. 461, upholds the algal nature of the chlorophyll masses of green animals, a view which he claims to have published in Hungarian in 1876. On the general subject, see also P. Geddes, Tr. R. Soc. Edinb. 1882 (abstract in Nature, xxv. p. 303), where he establishes a new genus, *Philozoon*, for the alleged parasitic algæ; and *id.* Nature, *tom. cit.* p. 361, and E. P. Wright, *l. c.* p. 362, who states that spores of an alga, *Chlorochytrium*, have been found by him in the bodies of animals, adapting themselves to the circumstances. See also Brandt, *l. c. suprà*, who sums up the chief facts relating to chlorophyll as connected with animals, and the observations relating to it. He finds that the green bodies of the *Spongillidæ* differ from those of *Hydra* and ciliated *Infusoria* only in being decidedly smaller. He still regards them, in whatever animals they occur, as Algæ. Experiments on *Spongilla* showed that it can live for a month without food, in filtered water. Brandt concludes that the green bodies have the same action on their animal hosts as the chlorophyll on plants. The animal is to be regarded as parasitic on the plant. These associations of Algæ and animals are termed *Phytozoa*.

Carter (5) remarks on the absence of any structure accompanying the green colour in *Spongilla*, and on the possibility of its being derived from Algæ.

Spongilla fluviatilis, (10) pl. xx. figs. 1–14. The occurrence of chlorophyll and amyloid substance in its cells is demonstrated by Lankester. The chlorophyll is present in the form of corpuscles, normally $\frac{1}{10000}$ to $\frac{1}{12000}$ inch in diameter, and concavo-convex in shape, each found attached cap-wise to a portion of the cell-protoplasm when the cell is broken up by mechanical violence; they multiply by fission. An amyloid substance was found in the cells under two forms: (1) occupying large vacuoles in the protoplasm; (2) as fine granules on the surface of some cells, and embedded in the superficial protoplasmic layer; such vacuoles stained with picrocarmine after treatment with osmic acid, and hence appear to contain also an albuminous substance; they are equally abundant in pale flesh-coloured, and in green specimens of *Spongilla*; were found very abundant in October, and are perhaps connected with the nutrition of the gemmules during the winter; (2) are perhaps derived from (1). Colourless specimens of *Spongilla* contain colourless corpuscles of an irregular angular shape; pale green specimens contain a few coloured chlorophyll corpuscles besides these uncoloured ones; the assumption of a green

colour by the latter, when treated with sulphuric acid, appears to favour the view of their being formed by the protoplasm of the sponge-cell; they appear not to be colourless parasitic Algæ; starch is not found in connection with them. The importance of the green matter to the vital powers cannot be great, and it is not necessary to the formation of amyloid matter.

Spongilla fluviatilis stated by J. H. Hunt, J. Cincinn. Soc. v. p. 194, to have been found "in an office aquarium" in Cincinnati.

Spongilla fluviatilis in the rivers Rhine, Main, Saale, and Tauber; Leydig, Verh. Ver. Rheinl. xxxviii. pp. 150 & 151.

Spongilla fluviatilis, var. *japonica*, from Tokio, Japan. Its characters pointed out by F. Hilgendorf, SB. nat. Fr. 1882, p. 26.

Spongilla lieberkuehni and *contecta*, Noll, (13) p. 175. Growth described; the form is affected by the character of the surface to which the sponges attach themselves.

Spongilla lacustris, auctt., (6) p. 6, figs. 4, 6, 7, & 10. Is widely distributed in European Russia, and found in the Caucasus, Siberia, and Kamtschatka. Colour, form, structure, and spicules fully described; tables of the proportions of the latter are given; the skeleton spicules vary in proportions from a maximum of ·25 by ·01 mm. in Siberia, to a minimum of ·114 by ·002 mm. in the Gulf of Finland.

Meyenia. 3 species from Russia described by Dybowski (6); tables of the size of the spicules are given in each case; viz., No. 1, p. 13, figs. 3 & 9, from South Russia and Livonia; perhaps = *M. fluviatilis*. No. 2, p. 15, figs. 5, 8, & 11, from Esthonia, the Dnieper, and Poland; perhaps = *Ephydatia muelleri*. No. 3, p. 18, figs. 1 & 2, represented by a var. from Kamtschatka, and another from the province Minsk, West Russia; also some doubtful specimens from the Caucasus and Georgia. The skeleton spicules of var. *a* show all transitions from smoothness to the spined character; both conditions may occur in the same fibre.

Parmula browni, (5) p. 367, pl. xvi. fig. 12; "microcell structure" of crust of gemmule.

Carterella latitenta, tubisperma, Potts. The varieties of the cirrous appendages of their gemmules figured by Carter, (3) pl. xiv, figs. 1-5, 7-10, compared with those of the Polyzoon, *Pectinatella*, and the differences in the different species of the genus pointed out. The birotulate spicules in the genus show a variation in length similar to that seen in *Heteromeyenia*.

DESMACIDINIDÆ.

Group *Esperina*, Carter. That author, (2) p. 288, discusses its characters.

Esperia, Carter, (2) p. 293, criticises Bowerbank's descriptions of the anchorate spicules. He calls attention to the occurrence of a small equianchorate in some species. He considers *Hymeniacidon macilenta*, Bowerbank, to be identical with *Rhaphiodesma floreum*, id., and states that *Esperia socialis*, Carter, = *E. immitis*, Schmidt. He finds nothing in the spiculation of the Sponges to indicate more than two distinct species of *Esperia*, as described in Bowerbank's British Sponges, viz., *Rhaphiodesma floreum* and *R. lingua*.

Esperia cupressiformis, var. *bihamatifera*, Carter, (17) p. 47, pl. iii. figs. 105–112, Barents Sea; referred by Vosmaer to *Cladorrhiza*, as *C. bihamatifera*.

Rhaphidotheca, Kent: the species discussed by Carter, (2) p. 299.

Desmacidon titubans, Schmidt; Carter, (2) p. 298, pl. xii. fig. 24.

Desmacidon constrictus, Bowerbank, (17) p 45, pls. iii. figs. 99–104, iv. fig. 153, Barents Sea; referred by Vosmaer to *Esperia*.

Desmacidon constrictus, pannosus, Bowerbank, recharacterized by Bowerbank, (1) pp. 176 & 177.

Hymedesmia johnstoni, Bowerbank, (2) p. 297, pl. xi. fig. 20. Its bihamate and that of the following species are really homologous with the anchorate of *Desmacidon titubans*. *Desmacidon* [evidently intended for *Desmacella*] *johnstoni*, Schmidt, is distinguished by Carter, *l. c.* p. 297, from Bowerbank's *Hymedesmia johnstoni*, under the name *H. schmidti*.

Halichondria forcipis, var. *bulbosa*, Carter, is perhaps a distinct species, approaching *Desmacidon anceps*; Norman, (1) p. 106.

Halichondria palmata, Johnston, referred to *Chalina* by Carter, (4) p. 109, who describes its anchorate spicule at length.

Spongia compressa, Esper. Specimens referred to this species by Carter, (4) p. 112, and assigned to the genus *Chalina*.

Reniera fibulata, Schmidt, recorded from Acapulco, (2) p. 284; *R. digitata*, l. c. pl. xi. fig. 3, from Antigua.

Phlæodictyina. New group defined by Carter, (4) p. 117. Based on *Oceanapia*, Norman, *Rhizochalina*, Schmidt, a new genus called *Phlæodictyon*, &c. The species enumerated and briefly described.

Oceanapia, Norman. The distinctness of this genus from *Desmacidon* vindicated by Norman, (1) p. 171.

Oceanapia jeffreysi, Bowerbank; synonymy, characters, and systematic position discussed by Carter, (4) p. 117.

Desmacidon fistulosa, Bowerbank. A new var. described by Carter, (4) p. 121, from S. W. Australia.

ECHINONEMATA.

Microciona prolifera found in stomach of fish; J. A. Ryder, Bull. U. S. Fish Comm. i. p. 246.

Ectyon sparsus, Gray, (2) p. 281.

Tricentrium lævе, Carter, redescribed by that author, (4) p. 114.

SUBERITIDÆ.

Carter, (2) pp. 347–354, discusses the spiculation and texture of these Sponges, and gives a classified list of the chief species of *Suberites* and its allies.

Suberites montiniger, Carter, (17) p. 31, pls. i. fig. 26, iv. figs. 137–139. *Suberites* sp. resembling *S. montiniger*; Carter, (17) p. 32, pls. i. figs. 22 & 23, iv. figs. 140–144.

Papillina. A small species briefly mentioned by Graeffe (7), from Triest, as distinct from *P. suberea*.

Cliona celata, Grant. From study of the living Sponge in oyster shells, Hyatt (8) is convinced that the Sponge is the agent which has produced the cavities in which it is enclosed, from the completeness with

which the often very extensive cavities are occupied by its substance, and from the inadequacy of the theory of erosion by Annelids to account for the appearances. The latter point is enforced by the absence of any traces of Annelids in the cavities, by the fact of the burrow increasing in diameter inwards, and by its notched and not smooth contour.

Cliona caribbæa, Carter, (2) p. 346, pl. xii. fig. 26, St. Vincent, W. Indies.

Vioa johnstoni, Schmidt: the species thus named in 1862 is renamed *V. schmidti*; id. (2) p. 348.

Spongia dysoni, id. (2) p. 350, pl. xii. fig. 25.

Alcyonium [= *Spirastrella*, Ree.] *purpureum*, Lamarck; *id.* (2) p. 352, pl. xii. fig. 28.

Terpios fugax, Duchassaing de Fonbressin & Michellotti, re-identified and described; *id.* (2) p. 355, pl. xii. fig 29, as a Suberitid.

Thecophora semisuberites, Schmidt; Vosmaer, (17) p. 30, pl. iv. figs. 133–136.

Polymastia mamillaris, Bowerbank, *Suberites appendiculatus*, Balsamo-Crivelli, *Rinalda arctica*, Mereschkowsky, all united with *Spongia penicillus*, Montagu, as *Polymastia penicillus*, by Vosmaer, (17), described, p. 26, pls. i. figs. 12 & 13, iv. figs. 127–132, from the Barents Sea.

Axos cliftoni, Carter, (2) p. 362.

Xenospongia patelliformis, id. (2) p. 357, pl. xii. fig. 32. A Group, *Xenospongina*, proposed by Carter, to include this form.

Rhizaxinella clavigera, Keller, = *Alcyonium pyriforme*, Delle Chiaje, and *Cribrella labiata*, Keller, = *Osculina polystomella*, Schmidt, according to Vosmaer, (16).

Tethya lyncurium, a new var., *obtusum*, described by Vosmaer, (17) p. 25, pl. iv. figs. 123–126, from near Hammerfest; based on the short stout rays of the globostellate spicule.

Donatia. A stellate spicule with spined arms, figured from a Cape of Good Hope specimen; Carter, (2) p. 361, pl. xii. fig. 23.

Donatia lyncurium, id. (2) pp. 358 & 360. Its distribution said to extend from Great Britain to W. Indies, the Cape, Mauritius, and S. Australia.

Tetractinellida.

Dercitus, Gray, upheld by Norman, (1) p. 93, as the true name of *Battersbyia* and *Pachastrella*; list of described species given.

Thenea wallichi. Under this name, Sollas (15) p. 427, pl. xvii., unites *Wyvillethomsonia* (*Thenea*) *wallichi*, Wright, *Stelletta agariciformis*, Schmidt, *Dorvillia* and *Tethya agariciformis*, Kent, and distinguishes the species from *Tethya muricata*, Bowerbank. The form and canal system, skeleton, and histology are fully described, and notes given on some of the developmental stages. Externally, it is remarkable for an annular depression, the equatorial recess, the chief seat of the pores. The pores communicate with ciliated chambers by series of vesicles, representing inhalant canals, and shut off from each other by sphincters; parts of the exhalant canals are also similarly vesicular. The probable explanation of these structural peculiarities is the need of a rapid, yet controllable, passage of water. Calculations are

made by which the area occupied by pores is determined to be ·096 of that of the surface of the Sponge, and 22 times that of the oscular openings, showing a great difference to exist in life between the rapidity of inhalation and exhalation of water. The spinispirular spicules appear to lie in the ectoderm. The mesoderm on the face of the other two layers exhibits fibrils resembling nerve-fibres. The matrix surrounding the processes of the mesoderm cells is sometimes fibrillated; at a short distance below the dermis, occurs a layer of connective-tissue cells, containing strongly refractive globules; the globules are perhaps albuminoid in nature; the sphincters of the water-canals are composed of fusiform mesoderm-cells, occasionally longitudinally striated; the sperm-balls are distributed throughout all the Sponge, except the neighbourhood of the surface. The hooks of the anchoring spicules are developed late, and appear as mere spines, accompanied by no terminal inflation of the spicule.

Thenea muricata. Under this name, Vosmaer, (17) p. 5, pls. i. figs. 1–8, ii. figs. 1–21, iv. figs. 114 & 115, includes *Tethya muricata*, Bowerbank, *Tisiphonia agariciformis*, Wyville Thomson, *Tethyopsis columnifer*, Stewart, *Wyvillethomsonia wallichi*, Wright, *Tisiphonia fenestrata*, Schmidt, besides other synonyms given with more or less certainty. Found up to 76° N. lat., and 45° E. long. Form described; symmetry remarked upon. The various forms of the pore-bearing horizontal furrow attributed to contraction; it is probably a special inhalant organ; the variation in the condition of the rooting-fibres is possibly connected with variations in the nature of the bottom. Vosmaer considers the specifically important spicules to be the acerate, the ternate with bifurcating rays, the simple ternate, the stellate, and the elongo-stellate; he describes the different modifications. Three varieties are distinguished under the letters α, β, γ, partly by the external form, partly by the spicules; α is represented by *Tisiphonia fenestrata*, Schmidt, β by *Tethea muricata*, Bowerbank.

Craniella merged in *Tetilla*, by Sollas (15).

Tetilla. Described species enumerated by Sollas, *l. c.* pp. 160 & 427. *T. cranium*, l. c. pp. 149 & 426, pl. vii. Histology, &c., described; the hamate spicules lie in the ectoderm. The canal system shows ecto- and endochones; the incurrent canals branch much. It has a small osculum. Dermis delicate, extended between projecting spicular fibres, covering the wide intermarginal cavities; the ectoderm of these cavities is formed by polygonal cells, and appears to contain bacillar spicules. The outer membrane, or skin, appears to consist of a structureless cuticula, covering a cellular ectoderm, but is itself perhaps also cellular during life. The mesoderm includes small round or oval cells and fusiform granular cells in strands or forming a thin subepidermal layer; such fusiform cells form sphincter muscles for the inhalant water-canals, while a few are ranged radially around these canals. The medullary substance, or mark, consists (besides the canals and chambers) of a transparent matrix, charged with abundant minute refractive granules and a few nuclei, also fusiform fibres near the spicular bundles, &c., and some large granular amœbiform cells with

large nuclei, which embrace the spicules ; here occur also the ova, found in special brood-chambers when large, at which time they are rich in yelk-granules. Sexes apparently distinct. The hamate spicules are developed around nuclei ; no cell-wall observed. From their position, and the characters of their parent cells, the cortical acerates appear homologous with the globates of *Geodina*. The elongate spicules remain long enclosed in their parent cells. The subdermal and flagellated chambers and the mark are developed early, the fibrous layers late. A comparison with *Rhaphidotheca* shows that *Tetilla* forms the transition from *Monactinellida* to *Tetractinellida*.

Tethya cranium. Norman, (1) pp. 39–43, recognizes 5 distinct varieties of this species as met with in British and outlying Scottish waters, stating at the same time his opinion that they may prove to be of specific rank : viz., var. 1, *typica* ; 2, *zetlandica*, Carter ; 3, *acufera*, nov. ; 4, *abyssorum*, Carter ; 5, *infrequens*, Carter.

Stelletta aspera, Carter, (1) p. 30, = *Ecionemia ponderosa*, Bk., according to Norman.

Pachymatisma johnstonia, (15) pl. vi. = *Caminus osculosus*, Grube. The histology, canal system, and spicules described by Sollas. The bacilli are homologous with the dermal stellates of *Geodia*. The oscular opening in this form is to be regarded as due to the excessive development of a single exhalant chone, whereas *Cydonium* is lipostomous, and *Isops* has a number of openings corresponding to as many chones, and *Geodia* has a single opening due to the union of several chones ; each (original) exhalant chone representing an individual. The pores are constant and confined to certain areas. The chones agree generally with those of *Geodia barretti* in form and minute structure. The main exhalant tubes open into a large chamber, which leads by a sphincterated opening into a terminal tube, the substratum of whose walls consists of vacuolated tissue ; the sphincter is very thick, and has a complicated structure.

Geodia barretti, Bowerbank, (17) p. 23, pls. iii. figs. 50 & 51, iv. figs. 120–122, from near Hammerfest, described. A system of crypts observed between the exhalant chones and canals.

Geodia gibberosa, (2) p. 363, pl. xii. fig. 31 ; probably includes *G. caribbæa*, Duch. & Mich., *tumulosa* and *tuberculosa*, Bowerbank.

Geodia gigas may attain a diameter of some feet ; Graeffe, (7).

Placospongia melobesioides, (2) p. 357, pl. xii. fig. 33. A group *Placospongina*, proposed by Carter, to include this form.

CALCAREA.

Leucaltis solida. Vosmaer finds, (16) p. 5, that the canal system belongs to the same type as *Leucandra aspera* ; he has experimented upon it in the living state with carmine.

Sycandra ciliata, a form mentioned by G. C. J. Vosmaer, Tijdschr. Nederl. Dierk. Ver. vi. p. lii., as transitional var. *coronata*, from Bergen-op-Zoom, reaching the size of 80 mm., and possibly uniting the species with *S. coronata* ; the specimens all hung mouth downwards.

New Genera and Species.

CERATOSA.

Aplysina compressa, cauliformis, longissima, Carter, (2) pp. 270 & 271, Nassau, W. Indies.

Luffaria cauliformis, with varr. *rufa, elongo-reticulata*, Carter, (2) pp. 268–269, Nassau and Antigua, W. Indies.

Euspongia compacta, Carter, (4) p. 106, South Australia.

Taonura, id. *l. c.* p. 108, without diagnosis. Based on *T. flabelliformis*, S. Australia, Illawarra, &c.; placed in group *Callhistia* of his classification.

Hircinia caraccensis, id. (2) p. 273, W. Indies.

Dysidea tubulosa, id. *l. c.* p. 275, Nassau, W. Indies; agrees with *Terpios jania*, Duch. & Mich.

SILICEA.

Chalinidæ.

Tuba acapulcaensis [*-censis*], Carter, (2) p. 280, Acapulco.

Chalina digitata, with var. *arenosa*, id. *ibid.*, New Zealand and Australia.

Patuloscula, id. *l. c.* p. 365, without diagnosis. Based on *P. procumbens*, sp. n., id. *ibid.*, Granada, W. Indies; inserted in family *Cavochalinida*.

Pachychalina caulifera, Vosmaer, (17) p. 33, pls. i. fig. 14, iii. figs. 64 & 65, Barents Sea ?. No vents or pores found in the pedicel.

Cribrochalina variabilis, id. (17) p. 36, pls. i. figs. 16 & 17, iii. figs. 67–69, Barents Sea, 220 fath., Matosjkin Shar, 2–11 fath., two varr. distinguished, *crassa* and *salpingoides*. *C. sluiteri*, id. *l. c.* p. 39, pls. i. fig. 18, iii. figs. 71–74, Barents Sea.

Renieridæ.

Reniera purpurea, Krukenberg, (9) p. 38, Triest. Only the colour described, viz., a rich purple; the colouring matter resembles that of *R. aquiductus* (see above) in most respects; but the aqueous solution shows an absorption band extending from line 13 to 16 of the spectrum.

Reniera incrustans, Eilh. Schulze, MS., (7). A Sponge is cited under this name, without description, by Graeffe.

Reniera crateriformis, Carter, (4) p. 115, Australia ?.

Isodictya bowerbanki, Norman (1), = *I. simulo*, Bowerbank.

Isodictya ferula, perplexa, crassa, paupercula, trunca, Bowerbank, (1) pp. 116, 123, 126, 129, & 132, pls. viii. *b*, figs. 1–6, ix. figs. 4–6, x. figs. 6–8, W. of Ireland.

Hymeniacidon solidus, id. *l. c.* p. 27, pl. iii. figs. 4–7, Westport Bay, Ireland.

Halichondria condensa, coralloides, id. *l. c.* pp. 102–104, pls. vi. figs. 1–3, vii. figs. 1–3, Isle of Man, Firth of Forth.

Microciona tumulosa, id. *l. c.* p. 50, pl. xi. figs. 1–4, Westport Bay, Ireland.

Thalysias repens, var. n., Carter. This author, (2) p. 282, pl. xi. fig. 10, thus describes a repent form of *T. subtriangularis* from the W. Indies.

Auletta elegans, Vosmaer, (17) p. 40, pls. i. fig. 20, iii. fig. 70, iv. fig. 158, off Novaja Zemlya, described as a Chalinid.

SPONGILLIDÆ.

Spongilla sceptroides, *S. botryoides*, W. A. Haswell, P. Linn. Soc. N. S. W. vii. p. 209, in pond, Brisbane, New South Wales.

Spongilla bombayensis, Carter, (5) p. 369, pl. xvi. figs. 5 & 6, Island of Bombay; the chitinous coat of the gemmule contains spicules and serves to attach it to foreign bodies.

Spongilla sibirica, Dybowski, (6) p. 10, fig. 12.

Spongilla stygia, Joseph, JB. schles. Ges. lix. p. 253 [not seen by the Recorder].

Meyenia ramsayi, W. A. Haswell, River Bell, Wellington, N. S. Wales, P. Linn. Soc. N. S. W. vii. p. 210.; another species of *Meyenia* from reservoirs, Sydney, not named, *id. ibid.*

Meyenia acuminata, Potts, P. Ac. Philad. 1882, p. 69, mixed with another species, from an aqueduct connected with Boston, U.S. Some abnormal features of the structure and spiculation are considered to suggest a possible hybridization between two species in this case.

Meyenia crateriformia [*-is*], Potts, (14) p. 12, from Schuylkill and Brandywine Rivers, &c.

Heteromeyenia ryderi, id. *l. c.* p. 13, from branch of Delaware River.

Tubella pennsylvanica, id. *l. c.* p. 14, Lehigh Gap, Pennsylvania.

DESMACIDINIDÆ.

Esperia lævis, Carter, (2) p. 291, pl. xi. fig. 16, Puerto Cabello, W. Indies; *E. obscura*, id. *l. c.* p. 299, pl. xi. fig. 18, Freemantle, W. Australia; *E. cunninghami*, id. *l. c.* p. 300, pl. xi. fig. 17, Falkland and Otter Islands, Patagonia; *E. plumosa*, id. *l. c.* p. 299.

Esperia lanx, Vosmaer, (17) p. 44, pl. iii. figs. 89–95, Barents Sea.

Rhaphiodesma fallaciosum, *intermedium*, Bowerbank, (1) pp. 163–166, pl. xvii., West of Ireland.

Esperiopsis, Carter, (2) p. 296. Without diagnosis; placed among the *Hymedesmina*; based on *Esperia villosa*, Carter, removed from *Esperia* because its anchorate spicule is equianchorate.

Hymedesmia schmidti, id. *l. c.* p. 297, pl. xi. fig. 21, = *Desmacidon* [evidently intended for *Desmacella*] *johnstoni*, Schmidt, from Florida.

Halichondria isodictyalis, id. *l. c.* p. 285, pl. xi. fig. 2, Puerto Cabello, W. Indies, and Acapulco.

Halichondria pustulosa, id. *ibid.* pl. xi. fig. 1, between Patagonia and Falkland Islands.

Alebion piceum, Vosmaer, (17) p. 42, pls. i. fig. 19, iii. figs. 75–82, Barents Sea.

Fibularia, Carter, (2) p. 282. Without diagnosis; the 3 new species included in it, viz., *F. massa*, from Long Key Island, Nassau, *ramosa*,

Puerto Cabello, *anchorata*, Antigua, Falmouth, pl. xi. figs. 12–14, have acerate and bihamate spicules, the last also an anchorate.

Phlœodictyon [*-um*], Carter, (4) p. 122. Without diagnosis; based on *P. isodictyiforme*, Vigo Bay, Spain, *hondurasense*, Honduras, *niduliforme*, hab. ?, *vasiforme*, Australia ?, spp. nn., *id. l. c.* pp. 122–124. Placed in the same group as *Oceanapia*, *Rhizochalina*, &c.; spicules acerate only in all the species.

Hymeniacidon armiger, Bowerbank, (1) p. 73, pl. iv. figs. 10–17, W. of Ireland.

Halichondria cylindricea, *robertsoni*, *flabellifera*, *virgea*, id. *l. c.* pp. 96, 100, & 107, pls. v. figs. 1–14, vi. figs. 4–8, vii. figs. 4–10, Durham, W. of Ireland, and loc. ?.

Isodictya hispida, *collina*, *funalis*, *implicita*, *inæqualis*, *deformis*, *scitula*, id. *l. c.* pp. 136, 146, 147, 150, 154, 157, 160, pls. iv. figs. 1–3, ix. figs. 1–3, xii. figs. 1–5, xiv., xv. figs. 5–10, xvi. figs. 1–14, W. of Ireland, Atlantic cable at 200 miles W. of Land's End, and loc. ?.

ECHINONEMATA.

Echinonema vasiplicata, Carter, (4) p. 114, S. W. Australia.

Hymedesmia pansa, *pilata*, *pulchella*, Galway, *peachi*, Wick, Scotland, Bowerbank, (1) pp. 56–64, pls. i. figs. 1–4, ii., & xiii. figs. 5–12.

SUBERITIDÆ.

Suberites capensis, Port Elizabeth, *antarcticus*, 74½° S. lat., *coronarius*, pl. xii. fig. 27, Bahamas, Honduras, Jamaica, Carter, (2) pp. 350–352; also 7 alleged new species of *Suberites*, briefly described without names, *id. ibid.*, from various localities.

Suberites stelligerus, id. (4) p. 124, Honduras; contains a stellate spicule.

Papillina rubra, Krukenberg, (9) p. 113, table vii., spectra 11–13, colour alone described; Adriatic Sea.

Terpios cærulea, Carter, (2) p. 355, pl. xii. fig. 30, Budleigh Salterton, S. Devon; the colour is due to a parasitic Alga.

Hymedesmia tenuicula, Bowerbank, (1) p. 68, pl. i. fig. 8, Wick and Galway.

Hymeniacidon hillieri, *virgulatus*, *callosus*, *tenebrosus*, id. *l. c.* pp. 79, 84, 86, & 90, pls. iii. figs. 1–3, iv. figs. 4–9, xv. figs. 1–5, off Dover, Durham, W. of Ireland.

Isodictya nodosa, *involuta*, *pertenuis*, id. *l. c.* pp. 141–146, pls. x. figs. 1–4, xiii. figs. 1–4, xiv. figs. 6 & 7, W. of Ireland.

Trachya durissima, Carter, (2) p. 357, Cape of Good Hope.

Radiella schœnus. Sollas, (15) p. 162, the distal projecting ends of the spicules are inflated.

Donatia multifida, Carter, (2) p. 358, pl. xii. fig. 22, Acapulco.

TETRACTINELLIDA.

Isops sphæroides, Vosmaer, (17) p. 13, pls. i. figs. 10 & 11, ii. figs. 27, 28, 39–49, iv. fig. 116, near Hammerfest; it possibly = *Alcyonium cranium*,

O. F. Müller. *I. pallida*, id. *l. c.* p. 16, pls. i. figs. 9 & 15, ii. figs. 22–26, 29–38, iv. fig. 117, near Hammerfest; it possibly = *Geodia globus*, Schmidt.

Synops, Vosmaer, (17) p. 20. Differs from *Isops* in having the vents already bounded by distinct walls, and these walls forming a perforated velum overhanging the sphincter; based on *S. pyriformis*, sp. n., *id. l. c.* pls. iii. figs. 52–63, iv. figs. 119 & 154, near Hammerfest.

General Anatomy and Physiology.

The position in the sponge-skeleton occupied by the different forms of spicules are brought forward by F. E. Schulze, Report of Versammlung deutscher Naturforscher und Aerzte in Eisenach, Zool. Anz. v. p. 530, as a proof that they owe these forms to statical principles and not to circumstances connected with crystallization.

In a discussion held at this meeting, E. Häckel accepts this view for Sponges. Marshall regards the axial substance of the spicule as all-important, and considers that the spicules arrange themselves in accordance with the directions of the currents of the water.

Noll (13) believes the ultimate form of a Sponge to be due, in the first instance, to the character of the surface to which it attaches itself: the ectoderm takes a lead in the changes of form.

Lipochrome :—The yellow and red pigments of Sponges, like those of most other animals, are almost without exception, according to Krukenberg, (9) tables vii. & viii., referable to this pigment. Thus, the extracts of *Tedania muggiana*, *Reniera aquiductus*, *Suberites flavus*, *Tethya lyncurium*, and *Clathria coralloides* show the presence of hepatochromatic substances, giving an absorption band between B and C, and being decomposed by caustic soda. After saponification of the extracts by alkali, certain compounds appear, having a definite set of absorption bands. Thus, the reddish-brown alcoholic extract of *Tedania muggiana* treated with petroleum-ether, yields yellow to orange compounds, giving a band at F and another at line 19; the yellow residue, after evaporation of the ether, becomes blue under the action of nitric or sulphuric acid, and dissolves readily in ether, chloroform, and carbon-disulphide, the colour and spectrum of the solution closely resembling that of Lipochrin; addition of chloride of sodium appears to convert a portion of the pigments into a substance entirely resembling Rhodophan. *Suberites massa* yields the same yellow pigment, and also a red one; *S. flavus* exclusively the yellow form. With *Papillina suberea* the spectrum has its bands nearer to the blue end than *S. flavus*. The yellow Lipochrome also occurs in *Hircinia spinosula*, *Reniera aquiductus*, *Tethya lyncurium*, *Cacospongia*, and perhaps *Chondrosia reniformis* and *Aplysina aerophoba*. That of a species of *Esperia* is a different form of the pigment. Krukenberg considers the variations of these pigments available for purposes of classificatory distinction in the *Suberitidæ*.

Conditions of life in the deep sea. T. Fuchs is reported in Ann. Sci. Nat. (6) xiii., article No. ii., as connecting the deep distribution of animals, including sponges, chiefly with light.

STEINMANN, (20) p. 187, describes the total solution even of quite large pieces of a recent Calcisponge in a small quantity of distilled water, as showing the inapplicability of this medium to the purpose of preserving parts of *Calcarea*.

Fossil Sponges, Chief Works on.

18. HINDE, G. J. Notes on Fossil *Calcispongiæ*, with descriptions of new species. Ann. N. H. (5) x. p. 185, pls. x.–xii.

A study of the *Pharetrones*, resulting in the upholding of this group as a member of the Order *Calcarea*.

19. MILLER, S. A. Description of two new genera and eight new species of Fossils from the Hudson River Group, with remarks upon others. J. Cincinn. Soc. v. p. 34, pls. i. & ii.

Includes Sponges, besides *Echinodermata*, &c.

20. STEINMANN, G. Pharetronen-Studien. JB. Mineral. ii. p. 139, pls. vi.–ix.

From a consideration of their geological distribution—Devonian to later Chalk—the very variable external form, the minute structure of the fibres and their spicules, and the condition in which they are found preserved, the author concludes that the group does not consist of calcareous Sponges, but forms an independent division of the *Cœlenterata*, in part greatly resembling the Sponges in their habitus, in part the *Hydrozoa*, but having some characters peculiar to themselves. Their dermal skeleton is represented only in the "star-corals" and *Hydrozoa*, and their skeletal structure can only be compared to that of the *Alcyonaria*. For some other arguments, and for the detailed classification and new forms, see below.

21. ZITTEL, A. K. Notizen über fossile Spongien. JB. Mineral. ii. p. 203.

DUNIKOWSKI, E. VON. Die Spongien, Radiolarien, und Foraminiferen der Unterliassischen Schichten von Schafberg bei Salzburg. Denk. Ak. Wien. xlv. p. 163, pls. i.–vi.

From the low horizon of the lower Lias, are described skeletal remains referred to 4 species of *Monactinellida* (the most abundant Order), 18 *Tetractinellida* (including one Lithistid), and 16 *Hexactinellida*. The author states that individuals are very abundant: the spicules are found composed of crystalline silex.

DUNIKOWSKI, *l. c.*, describes and figures from the lower Lias, without specific names, the following *Monactinellida*:—*Opetionella* ? sp., *Reniera* or *Suberites* sp., *Scoliorraphis* ? sp., *Esperia* ? sp., pp. 167–169, pl. i. figs; *Tetractinellida*:—*Pachyastrella* ? 5 spp., *Stelletta* ? 8 spp., *Geodia*, or ? 4 spp., Lithistid sp., pp. 169–176, 181, pls. i.–iv. figs.; *Hexactinellida*:—*Stauractinella*, 10 spp., *Hyalostelia*, 2 spp., *Tremadictyon*, 3 spp., *Craticularia* ? sp., pp. 175–181, pls. iii. & iv. figs.

HINDE (18) considers that the condition in which the *Pharetrones*

occur in the Upper Greensand at Warminster, Wiltshire, as compared with that of the *Lithistidæ* of the same deposit, proves the originally calcareous nature of their spicules, and that *Pharetrospongia strahani*, Sollas, as found in the Upper Chalk of Kent and Sussex, shows the same fact with regard to its spicules. He describes some new species from the Upper Greensand, Warminster, whose structure appears to him to further enforce these views (see *infrà*).

STEINMANN, (20), classifies the known *Pharetrones* as follows, provisionally, including various new genera and species, chiefly on the external characters and coarser anatomy of the internal cavities and skeleton; the spicules are seldom described:—

Suborder I. SPHINCTOZOA. *Pharetrones* with segmented skeleton.

Fam. 1. *Sphærocolidæ*. No central tube; osculum single, large, central, or multiple, either large surrounded by small, or small only. Genera:—

Sollasia, g. n., p. 151. Based on *S. ostiolata*, sp. n., pl. vii. fig. 3, from Carboniferous Limestone, Asturias.

Thaumastocœlia, g. n., p. 153. Based on *T. cassiana*, sp. n., pls. vii. fig. 5, viii. fig. 3, ix. fig. 5, from strata containing *Trachyceras aon*, near St. Cassian.

Celyphia, Pomel, *C. submarginata*, Münster, p. 158, pls. vii. figs. 8–10, x. fig. 3. Synonyms given.

Sphærocœlia, g. n., p. 162. Based on *Thalamopora michelini*, Simonowitsch, pl. vii. fig. 4, from Cenomanian, Essex.

Fam. 2. *Sphærosiphonidæ*. Distinguished from *Sphærocolidæ* by the presence of a more or less closed central tube. No tissue filling the interior of the segments; wall traversed by straight or slightly curved canals; a central osculum. Genera:—

Barroisia, Munier-Chalmas. Includes *B. anastomosans*, Mantell, pl. viii. fig. 1, *Discocœlia helvetica*, De Loriol & Gilliéron, pl. vi. figs. 5 & 6, ix. fig. 1.

Enoplocœlia, g. n., p. 166. Based on *Scyphia armata*, Klipstein, pl. vi. fig. 4. Distinguished by a compact epidermis and oscula with projecting margins.

Thalamopora, Rœmer.

Amblysiphonella, g. n., p. 169. Based on *A. barroisi*, sp. n., Carboniferous Limestone, Asturias.

Sebargasia, g. n., p. 171. Differs from *Barroisia* probably in the larger number of connecting tubes, and in the different manner of origin of the central tube. *S. carbonaria*, sp. n., Carboniferous Limestone, Asturias.

Fam. 2. *Verticillitidæ*. Differs from the preceding family by the presence of an anastomosing network within the segments.

Genera:—*Colospongia*, Lbe., *C. dubia*, Münster, pl. vi. fig. 3, *Verticillites*, Dfr., *V. cretaceus*, Dfr., pl. viii. fig. 2.

Fam. 3. *Cryptocœliidæ*. Based on *Cryptocœlia*, g. n., p. 176, *C. zitteli*, sp. n., pls. vii. fig. 1, viii. fig. 5, ix. fig. 4. The spicules resemble those of *Alcyonaria*.

Suborder II. INOZOA. *Pharetrones* with a continuous, *i.e.* unsegmented, skeleton.

Fam. 1. *Ochetidæ*. With true canal system; include *Eusiphonella* and *Corynella*, Zittel, *Stellispongia*, D'Orbigny, &c.

Fam. 2. *Anochetidæ*. Without canal system. Genera, *Himatella*, *Conocœlia*, *Peronella*, *Elasmocœlia*.

Steinmann, *l. c.*, considers that such *Inozoa* as *Liospongia* and *Amorphospongia*, D'Orbigny, by the characters of their canal system and the rectangular meshwork formed by their skeletal fibres, show a connection with some *Milleporidæ* and *Stromatoporidæ*.

Stellispongia variabilis, (20) p. 180, pl. ix. fig. 2, contains short, thick, blunt spicules, resembling those of the internodes of *Melithæa coccinea*, &c., but, according to Steinmann, scarcely like any sponge-spicules.

Borings of parasitic Thallophytes observed by Steinmann, *l. c.* pp. 181–185, in *Celyphia submarginalis*, pl. ix. fig. 3, and in *Thaumastocœlia cassiana*, pl. viii. fig. 3, in the latter case only in the outer and inner layers, not in the spicules. From the circumstances of their occurrence, he concludes that probably the calcareous skeletal elements were originally embedded in horny substance, and the skeleton resembled that of true Cœlenterates rather than Sponges.

Zittel (21) calls attention to Hinde's observation of elongate and triradiate or quadriradiate spicules in *Verticillites dorbignii*, *Corynella*, and *Stellispongia*, and considers the placing of the *Pharetrones* among the *Calcarea* justified by an examination of Hinde's preparations.

Astroconia granti, Sollas, described; P. G. Soc. 1881, p. 50, and Geol. Mag. 1881, p. 59, as well as in the place referred to in Zool. Rec. xviii. *Spong.* p. 14.

Siphonia pyriformis and sponge-spicula recorded from the Gault of the Blackdown Hills by W. Downes, J. G. Soc. xxxviii. p. 85.

Protospongia. Zittel, (21) regards it and *Dictyophyton* as rightly placed among the Sponges. He prefers to place *Protospongia* among the *Dictyonina*, in a distinct family with *Dictyophyton* and some other forms, distinguished by the very large and regularly fused 6-radiate spicules, whose externally and internally directed rays are entirely aborted; the skeleton forms a delicate, perhaps multi-laminar network, with cubic meshes; the form and structure resemble those of *Euplectella*. He reports Hinde's belief that a similar structure occurs in *Tetragonis* sp., from Gothland.

Astræospongia in *Stringocephalus*-beds in Middle Devonian; Schlüter, SB. Ver. Rheinl. xxxviii. p. 213.

Fossil Sponges from Jurassic of Northern Bohemia; G. Bruder, SB. Ak. Wien, lxxxv. pp. 453–488, describes *Pachytichisma lepas*, pl. ii. fig. 6, *Cypellia* (*Spongites*) *dolosa*, *Melonella radiata*, pl. ii. fig. 7, all of Quenstedt, and *Cylindrophyma milleporatum*, Goldfuss, and *Corynella madreporata*, Quenstedt, from this formation.

Occurrence of Sponges in the Senonian Chalk of W. and E. Prussia indicated; H. Schröder, Z. geol. Ges. xxxiv. p. 276.

List of Fossil Sponges from Upper Chalk, Cromer, Norfolk, by C. Reid, Mem. Geol. Surv. Engl. 1882, p. 5.

Spongilla fluviatilis, *Cliona*, from Pliocene, same locality; *id. l. c.* p. 65.

The Sponges found in the different formations in Britain enumerated

by R. ETHERIDGE in an address on the analysis and distribution of the British Palæozoic fossils, J. G. Soc. xxxvii. [1881] pp. 51–235, and by *id. op. cit.* xxxviii. pp. 59–236, in an address on the analysis and distribution of the British Jurassic fossils.

J. BADCOCK, Nature, xxv. p. 529, notices the invariable association of a red colour, in certain chalk-flints from Surrey with the presence of Sponge skeletons, which are here coated with iron oxide; the iron appears to be derived from the Sponge itself, either as metal or oxide.

NEW GENERA AND SPECIES.

See STEINMANN, *suprà*.

Barroisia, Munier-Chalmas, Bull. Soc. Géol. (3) x. p. 425. Based on *Tubipora anastomosans*, Mantell. Differs from *Verticillites*, Defrance, in the absence of the tubes which cross the chambers and subdivide at the point of contact with the upper plates.

Stromatocerium richmondense, Miller, (19) x. p. 41, pl. ii. fig. 1, Hudson River Group, Richmond, Indiana.

Dystactospongia, id. *l. c.* p. 42. Based on *D. insolens*, sp. n., p. 43, pl. ii. fig. 2, Hudson River Group, Cincinnati.

Pattersonia, id. *l. c.* p. 43. Based on *P. difficilis*, sp. n., *id. l. c.* pl. ii. fig. 3, Hudson River Group, Cincinnati.

Verticillites d'orbignyi [*dorbignii*], Hinde, (18) p. 192, pls. x. figs. 1, 2, 7, & 8, xi. figs. 1–24. The fibre is composed of filiform triradiates, with the third ray aborted; most of the spicules resemble those of recent *Leucones*. Upper Greensand, Warminster.

Corynella rugosa, id. *l. c.* p. 196, pls. x. fig. 4, xi. fig. 25, *C. socialis*, id. p. 197, pl. x. fig. 3, both from same deposit and locality as the preceding. Filiform fibre-spicules occur in these species also.

Sestrostomella rugosa, id. *l. c.* p. 198, pls. x. fig. 6, xii. figs. 1–15. It appears to have the felted uni-axial spicules which occur on the surfaces of some recent *Leucones*; the radiate spicules closely resemble those of *Leucones*. *S. clavata*, id. *l. c.* p. 201, pls. x. fig. 5, xii. figs. 16–25, like the preceding, from the Cretaceous formation near Havre. It exhibits essentially similar structures.

Leptophragma ramosum, Nova Acta Ac. L.-C. Nat. cur. xlii. p. 23, pl. i. figs. 1–5, *Plocoscyphia eggeri*, p. 24, pl. i. figs. 6–8, *Astrocladia furcata*, p. 25, pl. i. figs. 11–14, C. Gerster, from Chalk near Passau.

PROTOZOA.

BY

W. Saville-Kent, F.L.S., F.Z.S.

THE GENERAL SUBJECT.

Chief Works.

Bütschli, O. *Protozoa* in H. S. Bronn's Klassen und Ordnungen des Thier-reichs.

Parts 14–18, pp. 497–616, with pls. xxi.–xxxviii., 1882, continue the description of the *Gregarina*, partly illustrate this group, and complete that of the *Radiolaria*. The classificatory scheme of the *Gregarina* herein adopted is as follows :—

Sub-class *Gregarina*.

Order I. *Monocystidea*.

Tribe 1. *Monosporea*. Genera, *Orthospora*, *Eimeria*.

Tribe 2. *Oligosporea*. Genera, *Cyclosporea*, *Isospora*, *Coccidium*.

Tribe 3. *Polysporea*. Genera, *Klossia*, *Benedenia*, *Adelea*, *Monocystis*, *Gamocystis*, *Conorhynchus*, *Gonospora*, *Urospora*.

Order II. *Polycystidea*.

Genera, *Dufouria*, *Bothriopsis*, *Porospora*, *Stenocephalus*, *Hyalospora*, *Euspora*, *Clepsidrina*, *Pileocephalus*, *Echinocephalus*, *Stylorhynchus*, *Genciorhynchus*, *Actinocephalus*, *Pyxinia*.

Saville-Kent, W. Manual of the *Infusoria*, including a description of all known Flagellate, Ciliate, and Tentaculiferous *Protozoa*. [See Zool. Rec. xvii. & xviii.] London: 1882, imp. 8vo, pt. vi. pp. 721–913, pls. xli.–li.

This part completes the treatise; it concludes the description of the Peritrichous Order of the *Ciliata*, and comprises that of the *Hypotricha* and *Tentaculifera*.

PERITRICHA.

The remaining new genera and species of *Peritricha* are described.

Cothurnia irregularis, *cohni*, *gracilis*.

Pyxicola, p. 725. Differs from *Cothurnia* in development of a discoidal corneous operculum beneath the border of the peristome, which

closes the aperture of the lorica when the animalcule is retracted. Includes *P. pusilla, affinis, carteri*, spp. nn., and *Cothurnia operculifera*, S.-Kent, 1869, *C. pyxidiformis*, D'Udekem, *C. furcifer*, Hutton, *C. socialis*, Gruber.

Pachytrocha, p. 729. Resembles *Pyxicola*, but fleshy pad is developed beneath the peristome in place of a corneous operculum. For *Pachytrocha cothurnoides*, sp. n., inhabiting fresh-water.

Platycola, g. n., p. 731. Resembling *Vaginicola*, but lorica decumbent. Type, *V. decumbens*, Ehrenberg. *P. longicollis*, sp. n., also *V. mollis, dilatata, regularis, truncata, striata*, and *gracilis*, De Fromentel.

Ophionella, g. n , p. 734. Allied to *Ophrydium*, but animalcules singly inhabiting a mucilaginous sheath. Type, *O. picta*, sp. n., fresh-water.

Ophrydium sessile, sp. n., fresh-water.

HYPOTRICHA.

The Order *Hypotricha* is regarded as occupying the summit of the graduated scale of ciliate complexity, with relation to the diverse modifications and specialized character of the appendicular organs. 6 families are recognized, viz., 1. *Litonotidæ*, S.-K.; 2. *Chlamydodontidæ*, Stein, pt.; 3. *Dysteriidæ*, S.-K.; 4. *Peritromidæ*, Stein; 5. *Oxytrichidæ*, Ehrenberg; 6. *Euplotidæ*, Ehrenberg. The members of the genus *Glaucoma* are regarded as representing developmental phases only of *Aspidisca* and other allied *Hypotricha*. The following new genera and species are described :—

Cypridium, g n., p 754. Includes *Dysteria lanceolata, spinigera, aculeata*, and *crassipes* of Claparède and Lachmann; all these differ from the typical *Dysteriæ* in the simply tubular character of their pharyngeal armature.

Plagiotricha, g. n., p. 771. Separated from *Oxytricha* with reference to the oblique distribution of the ventral setæ. For *O. strenua*, Engelmann, and *O. affinis*, Stein.

Schizosiphon, g. n., p. 778. Animalcules resembling *Stichotricha*, but forming social colonies, and building up a compound zoothecium. Based on the *Stichotricha socialis* of Gruber.

Opisthotricha, p. 785. Frontal, ventral, and anal styles as in *Oxytricha*, supplemented by a variable number of tail-like caudal setæ. For *Oxytricha parallela* and *O. similis*, Engelmann.

Litonotus wrzesniowskii = *L. folium*, Wrzsniowski, nec *Dileptus folium*, Dujardin.

TENTACULIFERA.

The title of the *Tentaculifera* introduced by Prof. Huxley ("Anatomy of Invertebrata," 1877) is here maintained in place of that of the *Suctoria* originally proposed by Claparède and Lachmann, in recognition of the fact that in many recently discovered members of the group, suctorial processes may be partly, or even altogether, wanting. The term *Suctoria* is at the same time retained for the distinction of that section or Order in which suctorial tentacles are represented, while that of *Actinaria* is

established for the reception of those forms in which the tentacles are merely adhesive. With reference to the development of the *Tentaculifera* from ciliated embryos, the class, as a whole, is regarded as representing the most highly organized group of the Infusorial series. Affinities are at the same time recognized as probably subsisting, with relation to the comparative and physiological function of the tentacles, between this group and the *Rhizopoda* and *Radiolaria*. In the compound type *Dendrosoma*, whose reproductive phenomena are here exhaustively recorded for the first time, an extraordinary homoplastic resemblance to the colony-stock of a Hydroid zoophyte, such as *Coryne*, is suggested. The organism consists, in a like manner, of an adhesive creeping rhizome, which gives rise to erect ramifying branches, crowned at their extremities with prehensile capitate tentacles. The reproductive bodies are similarly represented by two distinct structures, those of the first order consisting of ovate, mouthless ciliated bodies, comparable to the Planula larvæ of a Hydrozoon, which are developed within excrescences of the main trunk. Embryos of the second order, bearing tentacles, and more nearly resembling an adult Acinetan, are produced as buds from the extremities of the branchlets. These are, in a like manner, likened to the tentaculiferous medusiform gonophores of the Hydrozoon. *Dendrosoma* is furthermore cited as the only example among the Infusorial series in which the individuality of the component zooids is so far obliterated, that the colony-stock may be justly described as a homogeneous multicellular organism, having, as in a Hydrozoon, a common nutritive fluid circulating throughout the creeping rhizome and ramifying branches.

The following families and genera are recognized :—

Div. A. TENTACULIFERA-SUCTORIA. Fam. i. *Rhynchetidæ* (genera, *Rhyncheta*, *Urnula*). Fam. ii. *Acinetidæ* (genera, *Sphærophrya*, *Trichophrya*, *Podophrya*, *Hemiophrya*, *Podocyathus*, *Solenophrya*, *Acineta*). Fam. iii. *Dendrocometidæ* (genus, *Dendrocometes*). Fam. iv. *Dendrosom[at]idæ* (genus, *Dendrosoma*).

Div. B. TENTACULIFERA-ACTINARIA. Fam. i. *Ephelotidæ* (genera, *Ephelota*, *Actinocyathus*). Fam. ii. *Ophryodendridæ* (genera, *Ophryodendrum*, *Acinetopsis*).

New genera and species introduced :—*Sphærophrya stylonychiæ*, *Podophrya wrzesniowskii*, *mollis*, *buckii*.

Hemiophrya, g. n., p. 822. Founded on *Podophrya gemmipara*, Hertwig ; distinguished from typical *Podophrya* by possession of tentacles of two orders, in part suctorial, and in part simply prehensile. Includes in addition, *Podophrya truncata*, Fraipont, *P. crustaceorum*, Heller, *P. pusilla*, Koch, *Hemiophrya microsoma* and *H. thouleti*, Maupas.

Podocyathus, g. n., p. 827. Develops a stalked lorica, as in *Acineta*, the tentacles of two orders, as in *Hemiophrya*. *P. diadema*, sp. n., from salt-water.

Acineta grandis and *stellaris*, spp. nn.

Actinocyathus, g. n., p. 848. Differs from *Ephelota* in secreting a pedicellated lorica. *A. cidaris*, sp. n., from salt-water.

Ophyondendrum porcellanum and *multicapitatum*, spp. nn.

BRANDT, K. Ueber die morphologische und physiologische Bedeutung des Chlorophylls bei Thieren. Arch. Anat. Phys. 1882, pp. 125–150, pl.

The import and relationship of the chlorophyllaceous corpuscles, which impart a characteristic green hue to *Hydra*, *Spongilla*, and various *Infusoria*, such as *Stentor polymorphus* and *Paramæcium bursarium*, are fully discussed, and maintained by Brandt to represent an independent endoparasitic group of unicellular Algæ, for which he proposes the new generic title of *Zoochlorella*. A like significance is applied to the "yellow corpuscles" of various *Radiolaria*, and which are distinguished by the generic name of *Zooxanthella*.

LANESSAN, J. L. DE. Traité de Zoologie. Protozoaires. Paris: 1882, 8vo, 336 pp., 281 figs.

This volume does not embody the results of original investigation, but is an excellent compilation, based upon the published works and separate papers of other specialists, whose figures and classificatory systems are reproduced throughout the treatise. In this manner, Hæckel's system and illustrations are chiefly associated with the *Monera*; those of Greeff, E. Schulze, and Bütschli with the *Amœbina*; Hertwig and Lesser, Carpenter, and Brady with the *Foraminifera*; Hertwig and Lesser and Hæckel with *Radiolaria*; Schneider with the *Gregarina*; and Stein and Saville-Kent with the *Infusoria*.

KRASZINSKI, S. Najnowsze badania swiata pierwotniakow (Neueste Untersuchungen über *Protozoa*). Kosmos; Lemb. 1882, pp. 108–119, 197–210, 323–325.

CIENKOWSKI, L. Reise ause Weisse Meer (*Protozoa*). Bot. Z. xl. p. 30.

New types described:—*Wagneria mereschkowskii*, g. & sp. nn. of *Protista*, somewhat between *Hæckelina* and *Clathrulina*; a colourless form of *Labyrinthula*, found within the dead cells of *Pylaicella* and other Phæosporous Algæ; a Moneron, *Gobiella borealis*, g. & sp. nn., closely allied to *Vampyrella* and the following *Flagellata*:—*Multicilia marina*, g. & sp. nn., having a protoplasmic body of variable contour, destitute of nucleus or contractile vesicle, and possessing several flagella; *Exuviaella marina*, g. & sp. nn., having an ovum-shaped body, flattened horizontally on its upper surface, diversified by one or two round, shield-like markings, and bearing two flagella; and *Drepanidium boreale*, sp. n., with a spherical body, prolonged anteriorly into a curved beak, which gives origin to a simple flagellum.

ENGELMANN, T. W. Ueber Licht- und Farben-perception niederster Organismen. Arch. ges. Phys. xxix. pp. 387–400.

A careful investigation of the circumstances connected with the perception of light and colour by the lowest organisms has resulted in his attributing their sensitiveness of light to three principal modes or processes, viz., 1. Directly by modification of the interchange of gases,

without apparent addition of a sensation. 2. By modification of the sensation of necessity for breathing, owing to modification of the interchange of gases. 3. By setting up a specific process, which probably answers to our sensation of light. Of the foregoing, the first mode may occur either alone, or in combination with the second, or there may be a combination of the first and third. The motions of the *Oscillarineæ* and mobile *Diatomacea*, such as *Navicula* and *Pinnularia*, were determined to be referable to the first category, movement being here intimately connected with the presence of free oxygen, which, if not present, can be produced by these organisms in the light. When movements ceased through the absence of light, it was found that they might be revived by exposing the diatoms to the red band of the spectrum, the space between the lines B and C promoting the greatest activity. The ciliate Infusorian *Paramœcium bursarium*, is quoted as an example of the second order. Of this type it was observed that when the proportion of oxygen is normal, or somewhat in excess, the Infusorian is usually quiescent; if, however, the supply sinks below this degree, the animalcule becomes restless and moves to places in which there is more oxygen, such as the edges of the cover-glass; in good light, but under otherwise similar conditions, the specimens distribute themselves equally throughout the drop; active swimming is the consequence of serious diminution of the oxygen; if strong light is then applied for some minutes, the *Paramœcia* course rapidly about, and if insufficient supplies of oxygen are added from without, they show themselves very sensitive to alterations in the illumination of the spectrum, prefering more particularly, as in the preceding case, the red band between the lines B and C It is maintained, as an explanation of the foregoing phenomena, that, in default of oxygen from without, the chlorophyll contained in the mesoplasm of the living *Paramœcium* acts as it does in plants, viz., excretes oxygen, and exhibits in its action the same dependence on amount and quality of light as do the movements of the animalcules. In the Flagellate form, *Euglena viridis*, which with its allies *Colacium* and *Trachelomonas*, are taken as types of the third order, the tension of oxygen has little to do with the movements; in darkness and great dearth of oxygen, gradual dissolution produces an increasingly feeble sensitiveness to light, but even under high tension of oxygen the reaction with light appears to be always less than usual; when the drop of water is partially illuminated the *Euglenæ* gradually assemble in the lighted area, and usually remain there; if a shadow is thrown upon the anterior chlorophyll-less portion of the body, the animalcule turns and behaves as though wholly in darkness; this, it is maintained, is not due to the eye-spot which is placed here, as the reaction is effected when the darkness first reaches the pootoplasm outside it; a like sensitiveness of the anterior end of the body is generally distributed amongst animals, occurring in *Paramœcium bursarium*, in spite of the greater amount of chlorophyll contained in the posterior region. The difference between *Paramœcium* and *Euglena* in relation to light, is more distinctly shown by the use of the spectroscope; while the former prefers the slightly refrangible red rays, the latter prefers the blue end of the spectrum, whether gaslight or daylight be employed.

BALBIANI, E. G. Les organismes unicellulaires. Les Protozoaires. J. Microgr. v. pp. 63, 116, 156, 203, 257, 292, 321, 357, 388, 435.

GRASSI, B. Intorno ad alcuni Protiste endoparassitici ed appartinenti alle Classi dei Flagellati, Lobosi, Sporozoi, e Ciliati. Milano: 1882, 8vo, 95 pp., 4 pls.

MAGGI, L. Protistologia. Milano: 1882, 8vo, pp. 183, 65 woodcuts.

——. Protistologica dell' acqua del Lago di Toblino. Boll. scient. iv. pp. 18–22.

——. Protistologia. Sulla acromatia degli afaneri. Rend. Ist. Lomb. (2) xv. fasc. 3.

——. Protistologia applicata. Sull' analisi protistologica dell' acqua del Lago Maggiore. *L. c.* fascc. 9 & 10.

PARONA, C. Materiali per la Faune dell' Isola di Sardigna. I. Protisti della Sardigna. Boll. scient. iv. pp. 44–58.

CERTES, A. Les eaux potables (Organismes microscopiques). La Tribune médicale, xv. pp. 464 & 465.

HITCHCOCK, R. The Phenomena of Growth among the Microscopic Forms of Life. Am. Micr. J. iii. pp. 28–34.

LANDSBERG, B. Über Conservirung von Protozoen. Zool. Anz. v. pp. 336 & 337.

After the usual treatment with one per cent. osmic acid and picrocarmine, the specimens are transferred to glycerine instead of to Canada balsam. *Actinosphærium eichhorni* yielded remarkably good results in this connection, the contractile vacuoles and the reticulated structure of the ectosarc remaining well defined.

KORSCHELT, E. Eine neue Methode zur Conservirung von Infusorien und Amœben. Zool. Anz. v. pp. 215–219.

For the preservation of many *Infusoria*, and more especially of *Amœbæ*, in a natural state of extension, a two per cent. solution of chromic acid has been found highly successful. This solution is allowed to act upon the examples treated for two or three minutes, when they are ready for transfer to a solution of alcohol, and thence through oil of cloves to balsam.

BÜTSCHLI, C. Gedanken über Leben und Tod. Zool. Anz. v. pp. 64–67.

CHOLODKOWSKY, N. Tod und Unsterblichkeit in der Thierwelt. Zool. Anz. v. pp. 264 & 265.

CLIVIO, I. I Protisti allo sbocco della Valcuvia. Boll. scient. iv. pp. 113–118.

ENTZ, G. Das Consortialverhaltnis von Algen und Thieren. Biol. Centralbl. i. pp. 451–464.

GEDDES, P. On the Nature and Functions of the "Yellow cells" of Radiolarians and Cœlenterates. P. R. Soc. Edinb. xii. pp. 377–396.

——. Further Researches on Animals containing Chlorophyll. Nature, xxv. pp. 303–305.

METSCHNIKOFF, E. Zur Lehre über die intracellulare Verdauung niedere Thiere. Zool. Anz. v. pp. 310–316.

CILIATA.

PHILLIPS, F. W. On a new Ciliate Infusorian allied to *Pleuronema*. J. L. S. xvi. pp. 476–478.

Calyptotricha pleuronem[at]oides, the new genus and species described, agrees in structure with *Pleuronema*; but differs from that type in the circumstance that it excretes and inhabits an elongate hyaline lorica, attached usually by its lateral surface to aquatic plants, and possessing a teat-shaped aperture at each extremity, from out of which the animalcule occasionally protrudes the anterior region of its body. Inhabiting fresh-water.

LEIDY, J. A new Infusorian belonging to the genus *Pyxicola*, S.-Kent. P. Ac. Philad. 1882, pp. 252 & 253, 2 figs.

Describes a new fresh-water species referable to the genus *Pyxicola*. In shape the lorica resemble that of *P. pusilla* and *P. affinis*, belonging to the English fresh-water series, but is annulate, as in *P. socialis*, a salt-water type.

——. Infusorial parasites of *Enchytræus* and *Distichopus*. L. c. pp. 145–148, 4 figs.

Anoplophrya modesta and *A. funiculus* are new *Opalinida* obtained from the body cavity of the Annelid *Enchytræus*, and a third species, *A. meli*, from that of a species of *Lumbricus*. A new Gregarine, *Monocystis mitis*, remarkable for enclosing a variable number of curved elliptical bodies, the supposed spores, inhabited a *Distichopus*.

STOKES, A. C. On a new species of *Thuricola*. Am. Micr. J. iii. pp. 182 & 183.

A new species referable to the Peritrichous genus *Thuricola*, S.-Kent, found in fresh-water in the leaflets of *Ceratophyllum*, is figured and described under the title of *T. innixa*.

MERESCHKOWSKY, C. Les Suctociliés, nouveau groupe d'Infusoires intermédiares entre les Cilies et les Acinétiens. C. R. xcv. pp. 1232-1235.

An Infusorian obtained from the Bay of Naples, and identified with the *Acarella siro* of Cohn, is maintained by Mereschkowsky to be an intermediate form between the two groups of the *Ciliata* and *Acinetina*, and is hence assigned to a new section, having the value of an Order, and denominated the *Suctociliata*. To a subglobose or pyriform body, resembling that of a small *Halterina*, is superadded a conical neck, perforated by the oral aperture. Four short suckers, affirmed to be identical in structure with those of an *Acineta*, are developed upon the margin of the neck orifice, with the aid of which the animal affixes itself to various objects. The neck, with its accompanying suckers, is capable of complete invagination; around the base of the neck, are developed the

collar of long, rigid cilia forming three circlets, with which leaping movements, corresponding to those of *Halteria*, are effected.

E. Maupas, *tom. cit.* pp. 1381–1384, adversely criticizes Mereschkowsky's views as to the affinities of *Acarella siro*, and maintains that an annectant type between the *Ciliata* and *Acinetida* is more correctly represented by the *Actinobolus varians* of Stein. The assimilation of the so-called suckers of *Acarella* to those of the *Acinetidæ* he considers to be a purely gratuitous assumption, no evidence being given as to their functional identity, and they, on their describer's showing, subserving only as adhesive organs. Maupas maintains his earlier declared opinion that the ancestral affinities of the *Acinetidæ* are to be sought among the *Heliozoa* rather than with the *Ciliata*.

Kowalevsky, M. Beiträge zur Naturgeschichte der Oxytrichinen. Phys. Denk. Warschau. ii. pp. 395–413.

Joseph, G. Mittheilungen über einen Grottenschwamm, einen Grottenpolypen, ein kunstlich conservirtes Glockenthierchen, &c. JB. schles. Ges. lix. pp. 253–255.

A new Vorticellidan, *Anthochloe proserpina*, closely allied to *Zoothamnium*, is described.

FLAGELLATA.

Künstler, J. Sur cinque Protozoaires parasites nouveaux. C. R. xcv. pp. 347–349.

Of the foregoing, 2 species were found within the intestine of the larva of *Melolontha vulgaris*. The first, of elongate clavate outline, with six long flagella, produced from its wider anterior end, is apparently referable to the genus *Hexamita*; a second form, with a more rounded contour, and possessing but four flagella, approaches *Tetramitus*, or may be the young of the preceding form. A more minute biflagellate type was obtained from the intestine of *Oryctes nasicornis*. Inhabiting the intestine of the tadpole of the frog, two types were recorded, the one differing from *Trichomonas batrachorum*, Perty, in that it possessed six superior flagella, one inferior trailing flagellum, and a long muscular (striated) caudal filament. The remaining, and fifth, type, for which alone a generic and specific title is proposed, that of *Giardia agilis*, has its body subdivided into two regions—an anterior more-inflated one, from the inferior surface of which several backwardly-directed flagella are developed, and a long narrow flexible tail-like portion, whose vigorous undulations convert it into a powerful organ of propulsion.

——. Recherches sur les Infusoires flagellifères. *L. c.* pp. 1432 & 1433.

Cryptomonas ovata, Ehr., on treatment with acetic acid, was observed to extrude minute filaments from all parts of the periphery, the length of some of these being equal to ten times that of the body, having for the most part an upward inclination. The analogous structures in *Chilomonas paramæcium*, Ehr., are regarded by Bütschli as defensive structures, or tri-

chocysts, similar to those developed in many *Ciliata*, and comparable to the urticating organs or nematocysts of the *Cœlenterata*. Kunstler, however, failed to detect in *Cryptomonas* the presence of the minute rod-like structures within which the filamentous prolongations should be at first enclosed, in order to fully establish the suggested homology with the trichocysts of the ciliated *Infusoria*. In the winter, *Cryptomonas ovata* was observed to acquire special characters; the cuticle becomes much thickened, the contained vacuoles showing very distinctly without the application of reagents, while the nucleus contains only a large nucleolus. In infusions in an advanced state of decomposition, Kunstler observed numbers of *Chilomonas paramœcium* in a sort of palmelloid state, the individuals being so imbedded within a common transparent gelatinous matrix as to closely resemble a Zooglœa.

[KUNSTLER, J.] Contribution à l'étude des Flagellés. Bull. Soc. Z. Fr. vii. pp. 1–112.

The types investigated by Kunstler were *Heteromitus olivaceus* (*Cryptomonas ovatus*, Ehr.), *Chilomonas paramœcium*, Ehr., *Euglena oxyurus*, Schmarda, *Phacus pleuronectis*, Duj., *Trachelomonas hispida*, Stein, *Entosiphon sulcatum*, Stein, *Chlamydomonas pulvisculus*, Ehr., and *Astasia costata*. In all these types, it is maintained that the flagella are not simple protoplasmic filaments as hitherto represented, but that under the highest magnifying power they exhibit a distinct transverse striature, and are, therefore, physiologically comparable to the ultimate fibrillæ of striped muscular tissue. According to Kunstler, *Chlamydomonas pulvisculus*, usually represented as possessing but two flagella, has four such structures; while in *Trachelomonas hispida*, a second minute retractile flagellum is said to be developed at the base of the single filament hitherto observed. In several of the types above enumerated, including especially *Heteromitus olivaceus* and *Chilomonas paramœcium*, the locomotive flagella were observed to be supplemented by a series of exceedingly fine, transparent, protoplasmic filaments, apparently subsidiary to the function of prehension. The tegumentary system, according to this author, is in *Cryptomonas* highly complex, consisting of no less than four distinct layers. These include an external hyaline cuticle, two subjacent highly vacuolate green layers, and an innermost layer enclosing polygonal starch-grains. A closely analogous structural composition of *Chilomonas*, *Phacus*, and *Euglena* is likewise described. The alimentary apparatus in *Cryptomonas*, according to Kunstler, is highly complex: it includes a digestive vestibule, a well-defined stomach, intestine, and anal aperture; the so-called stomach presents a remarkable cellular aspect, shown when highly magnified to be due to the close apposition throughout its area of a series of minute vacuoles of uniform size, which mostly enclose starch granules. The contractile vesicle is described as being bounded by a similar definite vacuolate wall, as is likewise also the so-called brood-chamber in the dorsal region, wherein are developed the germs derived from the breaking up of the nucleus. A new species of *Astasia*, *A. costata*, is figured and described.

Pouchet, G. Sur l'évolution des Péridiniens et les particularités d'organisation qui les rapprochent des Noctiluques. C. R. xcv. pp. 794–796.

Pouchet obtained from the Mediterranean in the month of October, four or five miles from shore, and at a depth of 80–100 metres, examples of of three Peridinians, *Ceratium tripos*, with var. *megaceros*, and *C. furca*, exhibiting what was apparently a hitherto unrecorded genetic phenomenon. Chains of two, three, and up to as many as eight individuals were found joined end to end. Their mode of union, in all instances identical, was accomplished through the insertion of the truncated extremity of the posterior spine of one zooid into the ventral depression of the succeeding individual. The examples so observed were perfectly motionless, and possessed neither flagellum nor cilia.

Krassilstchik, J. Zur Naturgeschichte und über die systematische Stellung von *Chlorogonium euchlorum*. Zool. Anz. v. pp. 628–934.

The developmental history is thus recorded. The young produced from the resting cells, at first brick red, do not usually present the fusiform shape of the parent. As many as sixteen minute, irregularly scattered pulsatory vacuoles were counted in the mature individuals. Reproduction takes place by successive fission; the entire contents of the capsule divide into from four to thirty-two parts, according to the generation to which the individual belongs: the cilia persist, and the movements of the individual are not interrupted until from fifteen to thirty minutes before the emergence of the young, or fission products, when the flagella disappear; the maternal envelope gradually dissolves, while the young move over each other, each possessing a delicate investing membrane. The first generation divides into eight, and the second into four fission products, forming the "macrogonidia" of Cienkowski. About ten days after an infusion is made, the progeny of the division into four again divide into thirty-two smaller individuals, or "microgonidia." After a short free existence, the microgonidia conjugate in pairs, fusing and forming a heart-shaped mass, which, in from fifteen to thirty minutes, ceases to move, and becomes a globular cell about 0.008 mm. in diameter; the flagella then disappear, and the cell grows to a diameter of 0.013 to 0.015 mm., and is invested by a rigid membrane. If the spherical cells produced by conjugation are dried and then moistened with water, the contents divide in four pieces which form young *Chlorogonia*, and becoming free, complete the cycle.

——. Zur Entwicklungsgeschichte und Systematik der Gattung *Polytoma*, Ehr. *L. c.* pp. 426–429.

A new species, *Polytoma spicatum*, having a more slender form than *P. uvella*, and with a pointed posterior extremity, is described. Its developmental phenomena are thus recorded:—The young issuing from the resting capsules grow to twice their original size, and then divide by fission into eight fragments, which remain for a time within the parental membrane, and occupy its entire cavity; the flagella of the parent cell likewise remain intact, and there is no interference with its ordinary locomotion. The parent membrane finally splits, releasing the

contained brood of eight units, which grow to the adult size. These, however, only split into four instead of into eight fragments, then conjugate with one another, and, arriving ultimately at the condition of resting cysts, complete the developmental cycle.

BERGH, R. S. Über die systematische Stellung der Gattung *Amphidinium*, Clap. u. Lackm. *Tom. cit.* pp. 693–695.

Supplements his previous essay on the *Cilio-Flagellata*, with a note in which *Amphidinium* is removed from the *Dinophyidæ*, to which it was originally referred, and placed among the *Gymnodiniidæ*.

BÜTSCHLI, C. Bemerkung über das von J. Kunstler entdeckte, neue, flagellatenartige Wesen, *Kunckelia gyrans*, Kunstler. *Tom. cit.* pp. 679–681.

Criticizes Kunstler's description of the complex alimentary and reproductive systems of the Flagellata, above recorded, and exposes the unsoundness of that writer's views by special reference to his recently established genus, *Kunckelia* [Zool. Rec. 1881, *Prot.* p. 30], pronounced by Kunstler to be a fresh-water ally of *Noctiluca*, but here demonstrated to be a *Cercaria*.

LANKESTER, E. RAY. On *Drepanidium ranarum*, the Cell-parasite of the Frog's Blood and Spleen. Q. J. Micr. Sci. ii. pp. 53–65.

The minute sausage-shaped parasitic organisms, *Drepanidium ranarum*, found chiefly in the frog's blood and spleen, described by Lankester in 1871, are reinvestigated and discussed in connection with Gaule's expressed opinion that they are not independent beings, but simply modified portions of the ordinary blood-corpuscles. The additional evidence adduced by Lankester is altogether in favour of their independent nature. The more familiar blood parasite of the frog, *Trypanosoma sanguinis*, Gruby, also maintained by Gaule to be a modified form only of the ordinary white corpuscles, or leucocytes, is likewise discussed with relation to its independent protozoic affinities.

WALLERSTEIN, H. Ueber *Drepanidium ranarum*, Lankester. Inaug-Diss. Bonn : 1882, 8vo, 39 pp.

CERTES, A. Sur les parasites intestinaux de l'huître. C. R. xcv. pp. 463–465.

In oysters, obtained from widely-separated localities, the presence within the stomach-cavity of one, if not two, infusorial parasites, was always detected. In oysters brought from Cancale and Marennes, a multiflagellate type, apparently identical with *Hexamita inflata*, Dujardin, was frequently observed. A yet more extensively distributed form, most nearly allied to the frog parasite, *Trypanosoma sanguinis* of Gruby, is described by Certes under the title of *Trypanosoma balbianii*.

NOLL, F. C. Ueber *Micrococcus conchivorus*. Als Korrosion oder Karriosität der Schnecken. Zool. Gart. xxiii. pp. 157–159.

To the foregoing species of *Micrococcus*, is attributed the capacity to corrode or injuriously affect the shells of various fresh-water snails and

mussels. The presence of these unicellular organisms was found intimately associated with diseased shells of these mollusks, and clean shells placed in the water containing them became diseased and infected with the *Micrococci* in a like manner.

PHILLIPS, F. W. On *Chlorodesmos hispida*, a new Flagellate Animalcule. Tr. Hertf. Soc. ii. pp. 92–94, 1 pl.

Chlorodesmos hispida, g. & sp. nn., occurs in colonies of about thirty zooids, grouped laterally in a chain-like manner, and apparently united by a hyaline ligament of extreme delicacy. Component zooids inhabiting close-fitting, transparent, sub-triangular loricæ; the surface of the lorica beset with minute spinous processes of even length. The narrower anterior extremity of the zooids perforated by the oral aperture, and bearing two long equal flagella. The endoplasm enclosing two well-marked lateral pigment bands of a greenish hue. Motions of a twofold nature, the entire chain of zooids elongating and contracting, the chain during elongation extending to about five times the retracted length, and the zooids closing separately upon one another in a clapper-like manner. Inhabiting fresh-water. Allied to *Uvella*, and referable to the same family of the *Chrysomonadidæ*, S.-Kent.

VILLE, N. Om *Chrysopyxis bipes*, Stein, og *Dinobryon sertularia*, Ehr. Œfv. Ak. Förh. xxxix. No. 6, pp. 9–22, pl.

PARKER, T. J. Recent Researches in the *Cilio-Flagellata*. Q. J. Micr. Sci. xxii. pp. 416–420.

RHIZOPODA.

LEIDY, J. On *Actinosphærium eichhorni*. P. Ac. Philad. 1882, pp. 260–262.

Examples of abnormal size of *Actinosphærium eichhorni*, at first taken for eggs, were found adhering to leaves of *Valisneria* in an aquarium. The diameter of their bodies, excluding the rays, varied from three-fourths to one millimetre in diameter. As food, the smaller and larger animalcules had absorbed, and retained at one meal, from three or four to as many as six water-fleas, of the genus *Daphnia*.

GRUBER, A. Beobachtungen an *Actinophrys sol*. Zool. Anz. v. pp. 423–426.

The examination of a large number of individuals of this Heliozoon revealed the fact that in the smaller examples no trace of a nucleus could be detected even with the use of reagents. The conjugation of full-grown nucleated with these smaller un-nucleated animalcules was repeatedly observed. The deduction is arrived at, that the nucleus in these organisms is in no way essential to functions other than those of reproduction.

BRADY, H. B. Note on *Keramosphæra*, a new type of Porcellaneous *Foraminifera*. Ann. N. H. (5) x. pp. 242–245.

The diagnosis of this new genus is thus given: Test free, porcellaneous,

spherical; formed of concentric layers, each consisting of a large number of chamberlets, arranged more or less regularly in single series. Chamberlets of the same layer, communicating with each other by short lateral stolons; those of the successive layers by the pores which formed the superficial apertures of the previous layer. Aperture consisting of numerous pores, one at the margin of each chamberlet. Colour white; surface areolated by the outlines of the somewhat convex chamberlets of the peripheral layer. Examples of the single species, *K. murrayi*, were dredged by the 'Challenger' from a depth of 1950 fathoms, 25 degrees south of the south-western corner of Australia. The external appearance is that of a globular variety of *Tinoporus*, while the arrangement of the chamberlets most nearly approaches that of *Orbitolites*.

DUNCAN, P. M. On the genus *Stoliczkaria*, Duncan, and its distinctness from *Parkeria*, Carp. & Brady. *Op. cit.* ix. pp. 58 & 59.

Stoliczkaria granulata, g. & sp. nn., is referred to the author's family of the *Syringosphæridæ*, including with *Syringosphæria*, Duncan ("Scientific Results of the Yarkand Mission," 1879, p. 10), a group of fossil *Rhizopoda* established by him for the reception of the sphæroidal organisms known in India as Karakoram stones. In *Stoliczkaria*, as compared with *Syringosphæria* and *Parkeria*, to which it also bears a considerable resemblance, the surface is covered by numerous granulations, separated by intervals about equal to their breadth. There are no pores on the surface; but tube-openings occur in the granulations. The central ones, which are small, are the terminations of the very numerous radial series, which, in section, are not very conical, but nearly straight, and give off minute offshoots to the surrounding convoluted and varicose larger tubes of the inter-radial series, which open towards the periphery of the granulations. There is no cœnenchyma.

MAUPAS, E. Sur le *Lieberkuhnia*, Rhizopode d'eau douce multinucléé. C. R. xcv. pp. 191–194.

The multinucleate structure of this Rhizopod is maintained, in connection with examples obtained from pond-water at Hamma, near Algiers. Another important histiological point established, is that the so-called chitinous shell, or test, is not an independent skeletal structure like that of *Arcella* and *Difflugia*, but simply a somewhat hardened integument or ectosare, which it is possible to isolate under the action of certain reagents. In the living animal, it adapts itself to every protean change of the body contour, and takes part in the fissive process of subdivision.

HEILPRIN, A. On the Occurrence of Nummulitic Deposits in Florida, and the Association of *Nummulites* with a Fresh-water Fauna. P. Ac. Philad. 1882, pp. 189–193.

Nummulites wilcoxi, a new species, figured and described, was obtained by Mr. Joseph Willcox, from the western shore of the peninsula of Florida, where it occurs in such quantities as to constitute a true Nummulitic rock. The rock is a white or yellowish-white friable limestone, found in the immediate neighbourhood of the Chushowiska River, Hernando County, four miles from the coast. The bed whence the fragments were obtained

occupies a level not more than two feet above the tide-water of the Gulf. The fragments of molluscan remains found associated with these *Nummulites* are chiefly referable to land and fresh-water genera, such as *Glandina*, *Paludina*, and *Ampullaria*, belonging to a period more recent than the eocene, and to species living at the present day. Remains of an *Orbitoides*, allied to *O. ephippium*, an Upper-eocene type, are, however, occasionally met with in the same rock-fragments, a circumstance which leads to the decision that the rocks marked by this admixture of an older and newer fauna, and comprising both marine and fresh-water types of organisms, have derived their faunal character in great part from the deposits of a more ancient formation, which represents and is the equivalent of a portion of the European "Nummulitic," whether eocene or oligocene.

TARÁNIK, K. J. Monographie der Nebeliden Böhmens. Ein Beitrag zur Kenntniss des susswasser Monothalamien. Abh. böhm. Ges. xi. pp. 1–56, 5 pls.

2 new species of the genus *Nebela*, Leidy, *N. bohemica* and *americana*, are figured and described; also *Corythion dubia*, a new generic and specific form, allied to *Trinema*, but separated from that type with reference to the structure of the test, which is composed of small oval plates, imbedded in an altogether irregular manner within an amorphous chitinous basis.

——. Über Rhizopoden und Diatomaceen der Torfmoore Südböhmens. Anz. 2 Vers. böhm. Aerzte, p. 55. (In Bohemian: Zool. Anz. v. p. 324.)

GEDDES, P. Observations on the Resting State of *Chlamydomyxa labyrinthuloides*, Archer. Q. J. Micr. Sci. (n. s.) xxii. pp. 30–34.

After describing the characteristic resting condition of this organism, its affinities are thus summed up. Its semi-amœboid character in the resting stage, and its exalted amœboid activity when mobile, might tempt one to refer it to the *Thalamophora*. Its cellulose wall, its red, green, and yellow colouring matter, make it seem rather referable to the Algæ. On the whole, the author is inclined to regard it as a degenerate form from the Palmellaceous Algæ, but one sufficiently aberrant to take place alone, and form the type of a new Order, *Chlamydomyxida*.

KLEIN, J. Ueber *Vampyrella*. Bot. Z. xl. pp. 208–218, 1 pl.

3 new species, *Vampyrella variabilis*, *V. inermis*, and *V. pedata*, are figured and described. All inhabit fresh-water, and were found associated with *Œdogonium* and other species of Confervæ.

——. *Vampyrella* und das Grenzgebeit zwischen Thier- und Flanzenreich. Biol. Centralbl. ii. pp. 137–142.

SCHACKO, G. Ueber Vorkommen vollkommen ausgibildeter Embryonen bei einer Rhizopode, *Peneroplis proteus*, d'Orb. SB. nat. Fr. 1882, pp. 130–132.

ARNDT, R. Beobachtungen an Amœben. MT. Vorpomm. xiii. pp. 106–109.

MILLER, S. A. On the genus *Monticulipora*. J. Cincinn. Soc. xv. p. 25.

occupies a level not more than two feet above the tide-water of the Gulf. The fragments of molluscan remains found associated with these *Nummulites* are chiefly referable to land and fresh-water genera, such as *Glandina*, *Paludina*, and *Ampullaria*, belonging to a period more recent than the eocene, and to species living at the present day. Remains of an *Orbitoides*, allied to *O. ephippium*, an Upper-eocene type, are, however, occasionally met with in the same rock-fragments, a circumstance which leads to the decision that the rocks marked by this admixture of an older and newer fauna, and comprising both marine and fresh-water types of organisms, have derived their faunal character in great part from the deposits of a more ancient formation, which represents and is the equivalent of a portion of the European "Nummulitic," whether eocene or oligocene.

TARÁNIK, K. J. Monographie der Nebeliden Böhmens. Ein Beitrag zur Kenntniss des susswasser Monothalamien. Abh. böhm. Ges. xi. pp. 1–56, 5 pls.

2 new species of the genus *Nebela*, Leidy, *N. bohemica* and *americana*, are figured and described; also *Corythion dubia*, a new generic and specific form, allied to *Trinema*, but separated from that type with reference to the structure of the test, which is composed of small oval plates, imbedded in an altogether irregular manner within an amorphous chitinous basis.

——. Über Rhizopoden und Diatomaceen der Torfmoore Südböhmens. Anz. 2 Vers. böhm. Aerzte, p. 55. (In Bohemian: Zool. Anz. v. p. 324.)

GEDDES, P. Observations on the Resting State of *Chlamydomyxa labyrinthuloides*, Archer. Q. J. Micr. Sci. (n. s.) xxii. pp. 30–34.

After describing the characteristic resting condition of this organism, its affinities are thus summed up. Its semi-amœboid character in the resting stage, and its exalted amœboid activity when mobile, might tempt one to refer it to the *Thalamophora*. Its cellulose wall, its red, green, and yellow colouring matter, make it seem rather referable to the Algæ. On the whole, the author is inclined to regard it as a degenerate form from the Palmellaceous Algæ, but one sufficiently aberrant to take place alone, and form the type of a new Order, *Chlamydomyxida*.

KLEIN, J. Ueber *Vampyrella*. Bot. Z. xl. pp. 208–218, 1 pl.

3 new species, *Vampyrella variabilis*, *V. inermis*, and *V. pedata*, are figured and described. All inhabit fresh-water, and were found associated with *Œdogonium* and other species of Confervæ.

——. *Vampyrella* und das Grenzgebeit zwischen Thier- und Flanzenreich. Biol. Centralbl. ii. pp. 137–142.

SCHACKO, G. Ueber Vorkommen vollkommen ausgibildeter Embryonen bei einer Rhizopode, *Peneroplis proteus*, d'Orb. SB. nat. Fr. 1882, pp. 130–132.

ARNDT, R. Beobachtungen an Amœben. MT. Vorpomm. xiii. pp. 106–109.

MILLER, S. A. On the genus *Monticulipora*. J. Cincinn. Soc. xv. p. 25.

King, W., & Rowney, T. H. An old chapter in the Geological Record, with a new Interpretation, ... with an Introduction giving an annotated history of the controversy on the so-called "Eozoon Canadense," &c. London: 1881, pp. 183, 9 pls. Reviewed in Geol. Mag. (2) ix. pp. 231–236.

The mineral origin of *Eozoon* is substantiated according to the author's views of serpentine rocky structure.

Bargatzky, A. Die Stromatoporen des rheinischen Devons. Inaug.-Diss. Bonn, 1881; also JB. Mineral. 1882.

Jones, T. Rupert. Catalogue of the Fossil *Foraminifera* in the British Museum. London: 1882, 8vo.

La Harpe, P. de. Étude des *Nummulites* de la Suisse. Abh. schw. pal. Ges. viii.

Munier-Chalmas, —. Caractères des *Miliolidæ*. Bull. Soc. Géol. x. pp. 424 & 425.

Häusler, R. Notes sur les Foraminifères de la zone à *Ammonites transversarius*. Bull. Soc. Vaud. xviii. pp. 220–229.

——. Notes on the *Trochamminæ* of the Lower Malm of the Canton Aargau, Switz. Ann. N. H. (5) x. pp. 49–61.

Dunikowski, E. v. Die Spongien, Radiolarien, und Foraminiferen der unterliassischen Schichten vom Schafberg bei Salzburg. Denk. Ak. Wien. xlv. pp. 34.

Stokes, A. C. A Food Habit of *Difflugia pyriformis*. Am. Micr. J. iii. p. 93.

Göes, A. Om ett oceaniskt *Rhizopodum reticulatum*, *Literolina scorpiura*. Œfv. Ak. Förh. xxxviii. pp. 33–35.

Engelmann, T. W. *Vampyrella helioproteus*, een nieuw Moneer. P. v. Ak. Amst. iii. pp. 3 & 4.

Hæckel, E. *Radiolaria*. Exploration of the Færoe Channel during the Summer of 1880 in H.M.S. 'Knight-Errant.' P. R. Soc. Edinb. xii. p. 19.

Schlumberger, C. Remarks upon a species of *Cristellaria*. J. Cincinn. Soc. v. p. 119.

Uhlig, V. Ueber einiger oberjurassische Foraminiferen mit agglutinirender Schale. JB. Mineral. i. pp. 152–155.

GREGARINIDA.

Balbiani, E. G. Sur les Microsporides ou Psorospermies des Articulés. C. R. xcv. pp. 1168–1171.

The so-called "corpuscles" (designated *Microsporidia*) of the Silkworm disease are regarded as the spores of an organism allied to the members of Leuckart's group of the Sporozoa, including the *Gregarinida*, oviform *Psorospermiæ* or *Coccidiæ*, the tubuliform *Psorospermiæ* or

Sarcosporidiæ and the fish *Psorospermiæ* or *Myxosporidiæ*. The *Microsporidia* of the Silk Moth, *Attacus pernyi*, are minutely described, as also those of an Orthopteron, *Platycleis grisea*.

——. Les Sporozoaires. Seconde partie du Cours d'Embryogenie comparée, professé au Collège de France pendant le seconde semestre de 1882. J. de Micr. vi. pp. 281-290, 348-356, & 448-447, 1 pl.

RÖSSLER, R. Beiträge zur Anatomie der Phalangiden, mit zwei neue Gregarinen. Z. wiss. Zool. xxxvi. p. 700.

Two new forms, figured and described, are found as parasites within the enteric canal of *Phalangiida*. *Actinocephalus fissidius*, sp. n., has developed at the anterior extremity twelve pairs of cleft hooklets, between each of which pairs is a simple spiniform process. In *Stylorrhynchus caudatus* the head-like anterior region is placed on a neck-like stalk, and has developed upon it twelve ridges or projections, which extend beyond the margin of the head, and then divide. At the opposite end a slender caudiform appendage is developed, which is not separated by a distinct septum from the body proper.

SCHNEIDER, AIMÉ. Seconde Contribution à l'étude des Grégarines. Arch. Z. expér. x. pp. 423–450, 1 pl.

——. Sur le développement des Grégarines et Coccidides. C. R. xcv. pp. 47 & 48.

The Gregarine genus *Stylorrhynchus*, inhabiting *Blaps*, was found to produce spores, aggregated in the form of a rosary. The matured spores, being moistened with fluid from the intestine of the host, open along their convex border, and give birth to sporozoa, which creep out by movements of their anterior extremity. After prolonged observation, these sporozoa endeavour apparently to penetrate the subjacent surface, which, under normal conditions, would be represented by epithilium. An examination of the intestinal tissues of the *Blaps* reveals the presence of *Coccidia* in every phase of development. The development of the *Monocystis*-form is produced by the division of the sporozoite into segments. The primary nurse-cell persists as a cup in the anterior or head-like region of the *Stylorrhynchus*. The development of the spores of the genus *Klossia* is likewise fully described.

INDEX TO

GENERA AND SUBGENERA RECORDED AS NEW IN THIS VOLUME.

INCLUDING NEW NAMES FOR GENERA ALREADY CHARACTERIZED.*

[The symbol ‖ indicates that the name to which it is affixed has been used before in Zoology.]

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Acamaldes, *Reitter*, Ins. 53
Acanthechinus, *Duncan*, Ech. 6
Acanthidops, *Ridgway*, Aves 35
Acharya ‖, *Moore*, Ins. 205 [-ria, *Hübner*, Lep. 1816]
Acherdocerus, *Kirby*, Ins. 147
Acœrus, *Pascoe*, Ins. 103
Acompomorpha, *Jakovleff*, Ins. 280
Acousmaticus, *Butler*, Ins. 191
Acrantus ‖, *Broun*, Ins. 108 [*Wagler*, Rept. 1830]
Acro[r]rhynchus, *Graff*, Verm. 4
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Actinocyathus, *S.-Kent*, Prot. 3
Acyclus, *Leidy*, Verm. 8
Addisonia, *Dall*, Moll. 84
Adialampus, *Des Gozis*, Ins. 27
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Adolesches, *Candèze*, Ins. 74
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Aello ‖, *Des Gozis*, Ins. 31 [*Leach*, Mamm. 1822]
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Agametrus „ „ 40
Agamodon, *Peters*, Rept. 13
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Alepidaspis, *Costa*, Ins. 132
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Amalopenæus, *Smith*, Crust. 23
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Amblysiphonella, *Steinmann*, Spong. 21
Ametastegia, *Costa*, Ins. 150
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* The number of new genera and subgenera recorded in the present volume is 1015, as against 1438 of vol. xviii. Without the *Protozoa*, which in the latter comprised 483 from a single describer, the number is greater by 70 in the present one. These 1015 are divided as follows:—*Mammalia*, 29; *Aves*, 19; *Reptilia* and *Batrachia*, 34; *Pisces*, 23; *Mollusca* and *Molluscoida*, 67; *Crustacea*, 46; *Arachnida*, 64; *Myriopoda*, 5; *Insecta*, 598; *Vermes*, 32; *Echinodermata*, 30; *Cœlenterata*, 27; *Spongiida*, 17; and *Protozoa*, 24. The unavoidable delay referred to in the preface has necessitated the publication of this long list of new names with scarcely any examination as regards prior occupation.—E. C. R.

Amphiaulacomys, *Lataste*, Mamm. 28
Amphiguathodon, *Boulenger*, Rept. 25
Amphissa, *Cambridge*, Arachn. 13
Ampycophora, *Meyrick*, Ins. 222
Amrella, *Moore*, Ins. 204
Amynilyspes, *Scudder*, Myr. 5
Anagotus, *Sharp*, Ins. 99
Anaitides, *Czerniavsky*, Verm. 14
Analota ‖, *Brunner*, Ins. 274 [-tes, *Schönherr*, Ins. 1839]
Anarthrura, *Sars*, Crust. 30
Anaspasis, *Candèze*, Ins. 74
Ancylosyrphus, *Bigot*, Ins. 244
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Eucaterva, *Grote*, Ins. 215
Eudiocrinus, *Carpenter*, Ech. 10
Euedwardsia [Evedw-], *Grote*, Ins. 206

Eugeniamyia [-nio-], *Williston*, Ins. 244
Eugithopus, *Chevrolat*, Ins. 107
Euherrichia, *Grote*, Ins. 206
Eulabes ‖, *Koch*, Arachn. 20 [*Cuvier*, Aves, 1817; -is, *Eschscholtz*, Ins. 1829]
Eulalides, *Czerniavsky*, Verm. 14
Eulintneria, *Grote*, Ins. 211
Eulobonyx, *Kraatz*, Ins. 80
Eulychius, *Jacoby*, Ins. 116
Eulytus, *Waterhouse*, Ins. 91
Eumerosyrphus, *Bigot*, Ins. 245
Eumiersia, *Smith*, Crust. 22
Euphronides, *Théel*, Ech. 9
Eurhinomallota, *Bigot*, Ins. 245
Eurybata, *Osten-Sacken*, Ins. 251
Euryopsis, *Kirby*, Ins. 147
Eurypharynx, *Vaillant*, Pisc. 23
Eurytarsa ‖, *Dokhtouroff*, Ins. 21 [-sus, *Dejean*, Ins. 1837]
Euscelinus, *Westwood*, Ins. 138
Euthyris, *Hincks*, Moll. 112
Eutrichesis, *Waterhouse*, Ins. 66
Evippa, *Simon*, Arachn. 19
Exapinæus, *Pascoe*, Ins. 90
Exedrium, *Grote*, Ins. 183
Exochoderes, *Bolivar*, Ins. 275
Exoria ‖, *Meyrick*, Ins. 227 [*Hübner*, Ins. 1816; -ra, *Chevrolat*, Ins. 1839]
Exuviaella, *Cienkowski*, Prot. 4

Falana, *Moore*, Ins. 204
Fannettia, *Dall*, Moll. 57
Fatua ‖, *Edwards*, Ins. 184 [*Dejean*, Ins. 1834]
Faustia, *Kraatz*, Ins. 88 [Fausta, *Desvoidy*, Ins. 1830]
Fenaria, *Grote*, Ins. 219
Fibularia ‖, *Carter*, Spong. 17 [*Lamarck*, Ech. 1816]
Fota, *Grote*, Ins. 205
Fotella, *Grote*, Ins. 206
Fritschia, *Dawson*, Rept. 27
Fungulus, *Herdman*, Moll. 105

Garudinia, *Moore*, Ins. 188
Gasola, *Reitter*, Ins. 51
Gastrobothrus, *Broun*, Ins. 53
Geochus, *Broun*, Ins. 100
Georgia, *Bourguignat*, Moll. 85
Giardia, *Kunstler*, Prot. 8
Glycerina, *Haswell*, Crust. 25
Gnathocera ‖, *Provancher*, Ins. 128 [*Kirby*, Ins. 1825; -rus, *Thunberg*, Ins. 1814]
Gobiella, *Cienkowski*, Prot. 4
Gonatas, *Distant*, Ins. 282
Goniophora ‖, *Jeffreys*, Moll. 88 [-rus, *Agassiz*, Ech. 1838]
Gonogala, *Butler*, Ins. 215
Grammonota, *Emerton*, Arachn. 14

Hadriania, *Bucquoy*, Moll. 38
Hadrocnemis, *Jakovleff*, Ins. 280
Hadromyia, *Williston*, Ins. 245
Hadrosoma ‖, *Koch*, Arachn. 20 [*Agassiz*, 1846, amending Adrosoma, *Motschulsky*, Ins. 1845]
Hagenulus, *Eaton*, Ins. 265
Halcyononotus [see Alcyonotus]
Halicalyx, *Fewkes*, Cœl. 7
Halicornopsis, *Bale*, Cœl. 8
Halicreas, *Fewkes*, Cœl. 8
Haliophasma, *Haswell*, Crust. 30
Haliphyta, *Bale*, Cœl. 9
Halitiara, *Fewkes*, Cœl. 7
Haploconus, *Cope*, Mamm. 33
Haplocope, *Sars*, Crust. 29
Haplopteryx, *Butler*, Ins. 216
Harita, *Moore*, Ins. 205
Harmatelia, *Moore*, Ins. 205
Harmologa, *Meyrick*, Ins. 227
Harmonia ‖, *Edwards*, Ins. 184 [*Mulsant*, Ins. 1846; *Hartman*, Moll. 1881]
Harpassa, *Simon*, Arachn. 11
Harponyx, *Sars*, Crust. 33
Hasodima, *Butler*, Ins. 216
Hathia, *Moore*, Ins. 183
Helioctamenus, *Schaufuss*, Ins. 59
Helminthophila, *Coues*, Aves 32
Helopimorphus, *Desbrochers*, Ins. 90
Hemicnemis ‖, *Selys*, Ins. 269 [*Müller*, Ech. 1840]
Hemidianeura, *Kirby*, Ins. 145
Hemigalidia, *Mivart*, Mamm. 20
Hemiganus, *Cope*, Mamm. 27
Hemiophrya, *S.-Kent*, Prot. 3
Hemiosus, *Sharp*, Ins. 47
Hemithlæus, *Cope*, Mamm. 33
Heosphora ‖, *Meyrick*, Ins. 222 [*Agassiz*, 1846, amending *Ehrenberg*, Prot. 1830]
Heptapotamia, *Alphéraky*, Ins. 203
Heptodon, *Cope*, Mamm. 31 [-odonta, *Hope*, Ins. 1838]
Herophydrus [!], *Sharp*, Ins. 39
Herrichia ‖, *Grote*, Ins. 206 [*Staudinger*, Lep. 1870]
Heterelmis, *Sharp*, Ins. 62
Heterocrossa, *Meyrick*, Ins. 223
Heter[o]hydrus, *Sharp*, Ins. 37
Heteropholis, *Fischer*, Rept. 9
Heterotanais, *Sars*, Crust. 28

Heteryon, *Sharp*, Ins. 47
Hexanchorus [-anco-], *Sharp*, Ins. 62
Hiccoda, *Moore*, Ins. 204
Hifo, *Candèze*, Ins. 74
Hingula, *Moore*, Ins. 205
Holissus, *Simon*, Arachn. 11 [-lisus, *Erichson*, Ins. 1840]
Homœodytes, *Sharp*, Ins. 41
Homœogenus, *Waterhouse*, Ins. 89
Homœonota, *Fairmaire*, Ins. 85
Homopsyche, *Butler*, Ins. 188
Homotechnes, *Candèze*, Ins. 74
Hoplosauris, *Butler*, Ins. 216
Humbe, *Bolivar*, Ins. 275
Huttonia, *Kirk*, Moll. 54
Huxelhydrus [!; ? Huxleyhydrus!], *Sharp*, Ins. 38
Hyada, *Moore*, Ins. 204 [-des, *Boisduval*, Lep. 1832]
Hydora, *Broun*, Ins. 62
Hydrocombus, *Sharp*, Ins. 47
Hydropeplus, *Sharp*, Ins. 38
Hydrotrupes [-trypes], *Sharp*, Ins. 40
Hyetodesia [see Yetodesia]
Hylonomus ‖, *Peters*, Rept. 22 [*Dawson*, Rept. 1860; -ma, *Dejean*, Ins. 1833]
Hyloscirtus, *Peters*, Rept. 22
Hymenopenæus, *Smith*, Crust. 23
Hyperxena, *Meyrick*, Ins. 223
Hyphoporus [!], *Sharp*, Ins. 39
Hypolæpus, *Kirby*, Ins. 151
Hyponysson, *Cresson*, Ins. 131
Hypophana, *Meyrick*, Ins. 223
Hypophthalmus, *Lenz*, Crust. 16
Hypophthalmus, *Richters*, Crust. 16
Hypopsolus, *Bell*, Ech. 9
Hypo[r]rhynchus, *Graff*, Verm. 4
Hypsoides, *Butler*, Ins. 185
Hypurus, *Rey*, Ins. 105
Hystriomyia, *Portschinsky*, Ins. 248
Hysudra, *Moore*, Ins. 176

Ilybiosoma, *Sharp*, Ins. 40
Immedia, *Pascoe*, Ins. 90
Incentia, *Broun*, Ins. 104
Inosomus, *Broun*, Ins. 108
Inozonites, *Pfeffer*, Moll. 64
Ioglossus, *Goode*, Pisc. 18
Iphigenia ‖, *Thomson*, Crust. 27 [*Schumacher*, 1817, *Gray*, 1840, Moll.]
Ischioceras, *Provancher*, Ins. 132
Ischyrosyrphus, *Bigot*, Ins. 244
Isochlora, *Staudinger*, Ins. 203

Jarasana, *Moore*, Ins. 204
Jarava, *Godwin-Austen*, Moll. 79
Jensenia, *Graff*, Verm. 5
Jumala, *Friele*, Moll. 39

Kallobombus [Calli-], *Dalla Torre*, Ins. 126
Karana, *Moore*, Ins. 204
Keramosphæra [Ceramo-], *Brady*, Prot. 12
Kirimyia, *Bigot*, Ins. 244
Kolbia, *Bertkau*, Ins. 263
Koonsia, *Verrill*, Moll. 59
Kreischiria, *Geinitz*, Arachn. 23

Læmocoris, *Jakovleff*, Ins. 283
Lamellaxis, *Strebel*, Moll. 75
Lamprocystis, *Pfeffer*, Moll. 64
Lancetes, *Sharp*, Ins. 41
Lapithes, *Bertkau*, Ins. 263
Lasiocercis, *Waterhouse*, Ins. 113
Lastrema, *Reitter*, Ins. 60
Latometus, *Butler*, Ins. 231
Lecanochiton, *Maskell*, Ins. 291
Lechriodus, *Boulenger*, Rept. 25
Leiotealia [Lio-], *Hertwig*, Cœl. 16
Leptinillus, *Horn*, Ins. 56
Leptognathia, *Sars*, Crust. 29 [-thus, *Swainson*, Pisc. 1839; *Westwood*, Ins. 1841]
Leptohyphes, *Eaton*, Ins. 265
Leptomelus, *Jakovleff*, Ins. 280
Leptoplax, *Dall*, Moll. 57
Leptosalis, *Thorell*, Arachn. 25
Leptothyrea, *Kraatz*, Ins. 69
Letharchus, *Goode*, Pisc. 29
Leucobombus, *Dalla Torre*, Ins. 126
Leuronectes, *Sharp*, Ins. 40
Lianoe, *Des Gozis*, Ins. 30
Limonophalus, *Elliot*, Aves 38
Liocranoides, *Keyserling*, Arachn. 12
Liothyris, *Douville*, Moll. 100
Lipothyrea, *Pascoe*, Ins. 98
Lissotarsus ‖, *Faust*, Ins. 105 [*Chaudoir*, Ins. 1838]
Lixodes, *Pascoe*, Ins. 101
Loboceras, *Kirby*, Ins. 146
Lophyroides, *Cameron*, Ins. 147
Lucifer ‖, *Döderlein*, Pisc. 28 [*Lesson*, Aves, 1829]
Lucilina, *Dall*, Moll. 57
Lugana, *Moore*, Ins. 204
Lycodonus, *Goode*, Pisc. 21 [-odon, *Boie*, Rept. 1827]
Lydomorphus, *Fairmaire*, Ins. 95
Lynchia, *Weyenbergh*, Ins. 253
Lyncodaphnia, *Herrick*, Crust. 35
Lysianella, *Sars*, Crust. 25

Macrogyrus, *Régimbart*, Ins. 45
Macrolyrcea, *Butler*, Ins. 215
Macroporus, *Sharp*. Ins. 39
Macro[r]rhynchus ||, *Graff*, Verm. 4 [*Lacépède*, Pisc. 1800; *Dunker*, Rept. 1844]
Macrosemyra, *Butler*, Ins. 193
Macrovatellus, *Sharp*, Ins. 36
Macroxyela, *Kirby*, Ins. 151
Mago, *Cambridge*, Arachn. 19 [-gus, *Lesson*, Mamm. 1827]
Malagasia, *Distant*, Ins. 286
Mantella, *Boulenger*, Rept. 21 [-tellia, *Parkinson*, Cœl. 1820]
? Margariona, *Dall*, Moll. 96
Margaromma, *Koch*, Arachn. 20
Marsipaster, *Sladen*, Ech. 7
Marumba, *Moore*, Ins. 183
Mastacomys, *Thomas*, Mamm. 29
Mathura, *Moore*, Ins. 205
Mausoleopsis, *Lansberge*, Ins. 69
Mecicobothrium, *Holmberg*, Arachn. 10
Mecomycter, *Horn*, Ins 81
[e]gadytes, *Sharp*, Ins. 41
egisthanus, *Thorell*, Arachn. 31
[-nes, *Vieillot*, Aves, 1818, as group]
Melaleucus, *Chevrolat*, Ins. 105
Melanobombus, *Dalla Torre*, Ins. 126
Melanochroa, *Broun*, Ins. 58
Melanodes, *Chaudoir*, Ins. 27 [-oides, *Olivier*, Moll. 1804]
Melanolophus, *Fairmaire*, Ins. 87
Melissopus, *Riley*, Ins. 227
Melyrodes, *Gorham*, Ins. 81
Meningodora, *Smith*, Crust. 22
Meniscoessus, *Cope*, Mamm. 39
Meroptera, *Grote*, Ins. 223
Mesanobium, *Sharp*, Ins. 83
Mesodiphlebia, *Zeller*, Ins. 222
Mesoeulalia [Meseu-], *Czerniavsky*, Verm. 14
Mesolamia, *Sharp*, Ins 113
Mesomystides, *Czerniavsky*, Verm. 14
Mesonoterus, *Sharp*, Ins. 41
Mesophylax, *McLachlan*, Ins. 256
Mesosites, *Deichmüller*, Ins. 113
Mestolobes, *Butler*, Ins. 219
Metacymus, *Sharp*, Ins. 47
Methemus, *Broun*, Ins. 83
Methles, *Sharp*, Ins. 40
Metoponichthys, *Kramberger*, Pisc. 14
Metopotylus, *Quedenfeldt*, Ins. 111
Metrea, *Grote*, Ins. 219
Metriopepla, *Fairmaire*, Ins. 120
Metronectes, *Sharp*, Ins. 40
Microcyptus [Micro-], *Horn*, Ins. 49
Microbiston, *Staudinger*, Ins. 215
Microcheles, *Haller*, Arachn. 30
Microclysia, *Butler*, Ins. 215
Microcyema, *Beneden*, Verm. 15
Microdesmes, *Candèze*, Ins. 74
Microgale, *Thomas*, Mamm. 26
Micromphalia, ? *Ancey*, Moll. 72
Microphyura „ „ 72
Micro[r]rhynchus ||, *Signoret*, Ins. 277 [*Megerle*, Ins. 1823; *Bell*, Crust. 1835]
Microthyrea, *Kraatz*, Ins. 69
Microtrombidium, *Haller*, Arachn. 27
Middendorfia, *Dall*, Moll. 57
Mimaster, *Sladen*, Ech. 7
Mimodes, *Ridgway*, Aves 27
Mioptachys, *Bates*, Ins. 34
Mithila, *Moore*, Ins. 204
Mitrephanus [Mitro-], *Coues*, Aves 35
Modiolicola, *Aurivillius*, Crust. 37
Mogrus, *Simon*, Arachn. 19
Molybdotus, *Fairmaire*, Ins. 96
Monœdus, *Horn*, Ins. 60
Monomphalus, ? *Ancey*, Moll. 72
Moroteuthis, *Verrill*, Moll. 35
Motama, *Moore*, Ins. 204
Mouillacitherium, *Filhol*, Mamm. 33
Multicilia, *Cienkowski*, Prot. 4
Munaria, *Reitter*, Ins. 59
Muricopsis, *Bucquoy*, Moll. 37
Murricia, *Simon*, Arachn, 13
Myelaphus [!], *Bigot*, Ins. 242
Mystrocnemis, *Quedenfeldt*, Ins. 113
Myxocherus, *Filhol*, Mamm. 33

Nadisepa, *Moore*, Ins. 176
Nagasena „ „ 204
Namunaria, *Reitter*, Ins. 59
Nannobatrachus, *Boulenger*, Rept. 20
Nasaya, *Moore*, Ins. 205
Nausicus, *Pascoe*, Ins. 109
Necrobioides, *Fairmaire*, Ins. 89
Neocatopygus, *Duncan*, Ech. 6
Neocattarus, *Distant*, Ins. 281
Neochlamys, *Jacoby*, Ins. 115
Neocordulia, *Selys*, Ins. 268
Neolithus, *Scott*, Ins. 288
Neoninus, *Distant*, Ins. 280
Neopempheris, *Macleay*, Pisc. 14
Neoplagiaulax, *Lemoine*, Mamm. 39
Neopsocus, *Kolbe*, Ins. 262
Neosalica, *Distant*, Ins. 278

Neoscolopax, *Salvadori*, Aves 44
Neothyris, *Douville*, Moll. 100
Neptosternus, *Sharp*, Ins. 37
Nesocordulia, *McLachlan*, Ins. 268
Neumoegenia, *Grote*, Ins. 206
Neuraphomorphus, *Reitter*, Ins. 55
Neurolestes, *Selys*, Ins. 269
Neusticosaurus, *Seeley*, Rept. 7
Nicoletiella, *Canestrini*, Arachn. 29
Nicthyphantes [Nyctiphantus] *Joseph*, Arachn. 11
Nikara, *Moore*, Ins. 204
Ninyas, *Distant*, Ins. 280
Niphopelta, *Reitter*, Ins. 59
Nitidulodes, *Sharp*, Ins. 47
Notelephas, *Owen*, Mamm. 30
Nothosema, *Goode*, Pisc. 23
Nothropus, *Burmeister*, Mamm. 38
Notochelys, *Owen*, Rept. 7
Notomicrus, *Sharp*, Ins. 36
Notophryxus, *Sars*, Crust. 34
Notopsila, *Osten-Sacken*, Ins. 251
Nyctibatrachus, *Boulenger*, Rept. 20
Nyctimantis „ „ 24
Nyctiphantus [see Nicthyphantes]
Nyctixalus, *Boulenger*, Rept. 20

Oenerodes, *Brunner*, Ins. 275
Odontothera, *Butler*, Ins. 216
Œthionectes, *Sharp*, Ins. 41
Ogmocerus, *Raffray*, Ins. 52
Ogulnius, *Cambridge*, Arachn. 16
Omotemnus, *Chevrolat*, Ins. 106
Onchidina, *Semper*, Moll. 80
Oocyclus, *Sharp*, Ins. 47
Oodiellus, *Chaudoir*, Ins. 27
Oosternum, *Sharp*, Ins. 47
Ophiodiscus, *Hertwig*, Cœl. 16
Ophionella, *S.-Kent*, Prot. 2
Ophiotricoides, *Ludwig*, Ech. 8
Ophirhina [Ophiorrhina], *Bocage*, Rept. 16
Opisthoplus, *Peters*, Rept. 16
Opisthotricha, *S.-Kent*, Prot. 2
Oromena, *Moore*, Ins. 205
Orthocynodon, *Scott*, Mamm. 31
Ortholophus, *Bigot*, Ins. 245
Osorno, *Candèze*, Ins. 74
Osphranticum, *Forbes*, Crust. 37
Oterophlœus, *Desbrochers*, Ins. 85
Otomesostoma, *Graff*, Verm. 4
Oxycnemis ‖, *Grote*, Ins. 206 [-mus, *Erichson*, Ins. 1843]
Oxycorynia ‖, *Drasche*, Moll. 107 [-nus, *Chevrolat*, Ins. 1832]
Ozœnimorphus, *Fairmaire*, Ins. 89

Pachycheta, *Portschinsky*, Ins. 248
Pachychilon, *Steindachner*, Pisc. 25
Pachycispia, *Butler*, Ins. 190
Pachycoccyx, *Cabanis*, Aves 39
Pachy[hy]drus [!], *Sharp*, Ins. 37
Pachytrocha, *S.-Kent*, Prot. 2
Padenia, *Moore*, Ins. 188
Palæocygnus, *Steineger*, Aves 47
Palæoprinodon, *Filhol*, Mamm. 20
Pallochiton, *Dall*, Moll. 57
Panaphysis, *Reitter*, Ins. 52
Panchala, *Moore*, Ins. 176
Pannychia, *Théel*, Ech. 9
Pantelamprus, *Christoph*, Ins. 231
Pantolambda, *Cope*, Mamm. 32
Parabalea, *Ancey*, Moll. 76
Paracarobia, *Czerniavsky*, Verm. 14
Parachortophila, *Bigot*, Ins. 250
Parædis, *Grote*, Ins. 203
Paraculalia [Pareu-], *Czerniavsky*, Verm. 14
Paralampas, *Duncan*, Ech. 6
Paralypia, *Kirby*, Ins. 145
Paramegischia, *Provancher*, Ins. 139
Paramellon, *Waterhouse*, Ins. 58
Paranthomyia, *Bigot*, Ins. 250
Paranychia, *Czerniavsky*, Verm. 15
Paraphileus, *Candèze*, Ins. 74
Parapodarke [-ce], *Czerniavsky*, Verm. 15
Parapolynoe, *Czerniavsky*, Verm. 15
Parapseudes, *Sars*, Crust. 30
Parapsilogaster, *Bigot*, Ins. 250
Pararhytida, ? *Ancey*, Moll. 72
Pararu[e]ppellia, *Haswell*, Crust. 15
Parasaphes, *Candèze*, Ins. 74
Parasyscia, *Emery*, Ins. 134
Paratasis, *Chevrolat*, Ins. 107
Paratya, *Miers*, Crust. 22
Parazelia, *Bigot*, Ins. 250
Pardileus, *Des Gozis*, Ins. 29
Parelater, *Candèze*, Ins. 74
Parelpidia, *Théel*, Ech. 9
Parmalomyia [? Parahom-], *Bigot*, Ins. 250
Paroster, *Sharp*, Ins. 39
Pasipeda, *Moore*, Ins. 205
Pasira „ „ 211
Patellus ‖, *Chaudoir*, Ins. 28 [*Montfort*, Moll. 1810]
Pattersonia, *Munier-Chalmas*, Spong. 23
Patuloscula, *Carter*, Spong. 16
Pectinodonta, *Dall*, Moll. 56
Peliocichla, *Cabanis*, Aves 26
Pelmatellus, *Bates*, Ins. 30
Pelosaurus, *Credner*, Rept. 28
Peniagone, *Théel*, Ech. 9

Pephysena, *Distant*, Ins. 281
Percolaus, *Bates*, Ins. 31
Periphanes ‖, Fairmaire, Ins. 91 [*Hübner*, Ins. 1816]
Perochthes, *Sharp*, Ins. 47
Petalolyma, *Scott*, Ins. 288
Phænonotum, *Sharp*, Ins. 47
Phanocerus, *Sharp*, Ins. 62
Phemonoe, *Edwards*, Ins. 184
Philanglaus, *Butler*, Ins. 197
Phlœodictyon [-tyum], *Carter*, Spong. 18
Phlogothauma, *Butler*, Ins. 184
Phorostichus, *Broun*, Ins. 100
Phrissogonus, *Butler*, Ins. 216
Phyllonereis, *Hansen*, Verm. 13
Physomerus ‖, *Chaudoir*, Ins. 28 [*Burmeister*, 1835, *Schönherr*, 1844, Ins.]
Physophrynus, *Fairmaire*, Ins. 87
Phystolyma, *Scott*, Ins. 288
Phytolyma „ „ 288
Pitrassa, *Moore*, Ins. 204
Plagiotricha, *S.-Kent*, Prot. 2
Platycola „ „ 2
Platynectes, *Sharp*, Ins. 40
Platynoscelis, *Kraatz*, Ins. 88
Platypelis, *Boulenger*, Rept. 21
Platyphyllum ‖, *Lindstrom*, Cœl. 20 [*Serville*, Ins. 1831]
Platy[r]rhynchus ‖, *Chevrolat*, Ins. 97 [*Desmarest*, Aves. 1805; *Thunbery*, Ins. 1815; *Cuvier*, Mamm. 1826]
Platystoma ‖, ? *Ancey*, Moll. 72 [*Klein*, Moll. 1753; *Meigen*, Ins. 1803; &c.]
Plectroboarmia, *Butler*, Ins. 215
Plesiolampas, *Duncan*, Ech. 6
Plethodontohyla, *Boulenger*, Rept. 21
Pleurothorax, *Chevrolat*, Ins. 107
Plioplatecarpus[-tyc-], *Dollo*, Rept. 10
Ploceella, *Oates*, Aves 34
Podocinum, *Berlese*, Arachn. 30
Podocyathus, *S.-Kent*, Prot. 3
Pœcilobombus, *Dalla Torre*, Ins. 126
Pogonodaptus, *Horn*, Ins. 29
Polyaspis, *Berlese*, Arachn. 30
Polychætus, *Chaudoir*, Ins. 27
Polyclonus, *Kirby*, Ins. 147 [-nia, *Brandt*, Cœl. 1838]
Polymastodon, *Kraatz*, Mamm. 39
Polyopis, *Hertwig*, Cœl. 17 [-opsia, *Mulsant*, Ins. 1840]
Polysiphonia, *Hertwig*, Cœl. 16
Polystalactica, *Cope*, Ins. 70
Polystom[at]idium, *Hertwig*, Cœl. 16
Poromitra, *Goode*, Pisc. 14
Porponia, *Hertwig*, Cœl. 17
Priatelus } *Broun*, Ins. 58
Priates }
Primospes, *Sharp*, Ins. 38
Priono[no]tomyia, *Bigot*, Ins. 245
Prio[no]xystus, *Grote*, Ins. 196
Proantigonia, *Kramberger*, Pisc. 16
Prodaticus, *Sharp*, Ins. 41
Progona, *Berg*, Ins. 188
Progonechinus, *Duncan*, Ech. 6
Promesostoma, *Graff*, Verm. 4
Pronoterus, *Sharp*, Ins. 36
Proscheimus, *Desbrochers*, Ins. 88
Prostheclina, *Koch*, Arachn. 20
Prothelymna, *Meyrick*, Ins. 227
Proteoteras, *Riley*, Ins. 227
Protithona, *Meyrick*, Ins. 227
Protocarobia, *Czerniavsky*, Verm. 14
Protomystides „ „ 14
Provocator, *Watson*, Moll. 44
Provortex, *Graff*, Verm. 5
Psacadoptera, *Kraatz*, Ins. 70
Pseudaleucis, *Butler*, Ins. 215
Pseudalophora, *Portschinsky*, Ins. 248
Pseudiconus, *Candèze*, Ins. 74
Pseudixodes, *Haller*, Arachn. 31
Pseudocerura, *Butler*, Ins. 192
Pseudochalcothea, *Ritsema*, Ins. 69
Pseudoclinteria, *Kraatz*, Ins. 69
Pseudodelma, *Fischer*, Rept. 12
Pseudolyprops, *Fairmaire*, Ins. 90
Pseudomphalus, ? *Ancey*, Moll. 72
Pseudoneptis, *Snellen*, Ins. 171
Pseudoneptunea, *Kobelt*, Moll. 42
Pseudopamera, *Distant*, Ins. 281
Pseudophthalmus, *Joseph*, Arachn. 19
Pseudoprotætia, *Kraatz*, Ins. 70
Pseudopsocus, *Kolbe*, Ins. 263
Pseudopsyche, *Edwards*, Ins. 191
Pseudo[r]rhiza, *Leudenfeld*, Cœl. 9
Pseudo[r]rhynchus ‖, *Graff*, Verm. 4 [Serville, Ins. 1839]
Pseudosestra, *Butler*, Ins. 216
Pseudosubulina, *Strebel*, Moll. 62
Pseudotanais, *Sars*, Crust. 29
Pseudotephræa, *Kraatz*, Ins. 70
Psittacotherium, *Cope*, Mamm. 26
Psychropotes, *Théel*, Ech. 10
Psychrotrephes „ „ 9
Pternohyla, *Boulenger*, Rept. 24
Pterocolus ‖, *Haller*, Arachn. 33 [*Schönherr*, Ins. 1833]

Pterotocera, *Staudinger*, Ins. 216
Pterycollasaurus [-collo-] *Dollo*, Rept. 10
Ptiliodes, *Matthews*, Ins. 57
Ptilostylomyia, *Bigot*, Ins. 245
Ptochostola, *Meyrick*, Ins. 223
Pycnulia, *Zeller*, Ins. 222
Pyla, *Grote*, Ins. 223 [-lus, *Newman*, Ins. 1841]
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R[h]omaleosyrphus, *Bigot*, Ins. 245
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Richardina, *Milne-Edwards*, Crust. 23 [-dia, *Desvoidy*, Ins. 1830]

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Scytophorus, *Hertwig*, Cœl. 17
Sebargasia, *Steinmann*, Spong. 21
Selaophora ‖, *Koch*, Arachn. 20 [-rus, *Swainson*, Aves, 1831, script. Selasphorus]
Sericospilus, *Sharp*, Ins. 66
Sicyonis ‖, *Hertwig*, Cœl. 17 [-na, *Milne-Edwards*, Crust. 1830; -nia, *Hübner*, Ins. 1816]
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Syncirsodes, *Butler*, Ins. 215
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Talitropsis, *Bolivar*, Ins. 274
Tama, *Simon*, Arachn. 13
Tambana, *Moore*, Ins. 204
Tanagridia, *Butler*, Ins. 216
Tanycnemus, *Faust*, Ins. 96
Tanypus [illegible], *Koch*, Arachn. 20 [*Meigen*, Ins. 1803; *Oppel*, Aves, 1812]
Taonura, *Carter*, Spong. 16
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Tarsalgus, *Candèze*, Ins. 74
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Tecmessa, *Cambridge*, Arachn. 16
Tedia, *Simon*, Arachn. 11
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Telethrus, *Pascoe*, Ins. 90
Teloganodes, *Eaton*, Ins. 265
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[illegible]mnornis, *Milne-Edwards*, Aves 28
Thanatopsyche, *Butler*, Ins. 191
[illegible]haumastocœlia, *Steinmann*, Spong. 21
[illegible]nea, *Scott*, Ins. 288
[illegible]ecospondylus, *Seeley*, Rept. 6
[illegible]lyterotarsus, *Weise*, Ins. 115
[illegible]narellus, *Bates*, Ins. 30
[illegible]ridula, *Emerton*, Arachn. 14
[illegible]rosa, *Koch*, Arachn. 20
[illegible]racobombus, *Dalla Torre*, Ins. 16
[illegible]rellia, *Koch*, Arachn. 20
[illegible]rophorella, *Greeff*, Moll. 87
[illegible]ophorus, *Schreiner*, Ins. 108
[illegible]obia, *Kolbe*, Ins. 263
[illegible]idemyia [Tigriomyia, Tigrido-, Tigroido-], *Bigot*, Ins. 245
[illegible]on, *Hay*, Pisc. 25
[illegible]ophasma, *Brongniart*, Ins.

[illegible]a, *Moore*, Ins. 205
[illegible]s, *Des Gozis*, Ins. 102
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[illegible] *Verrill*, Ech. 8

Trapezus, *Distant*, Ins. 281 [-zia, *Latreille*, Crust. 1825]
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Trichopleura, *Staudinger*, Ins. 216
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Tyriotes, *Pascoe*, Ins. 104

Udorius, *Broun*, Ins. 62 [-ra, *Münster*, Crust. 1839]
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Uvea, *Fauvel*, Ins. 25

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Xouthous, *Thomson*, Crust. 39
Xybaris, *Reitter*, Ins. 52
Xylococcus, *Löw*, Ins. 291

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END OF THE NINETEENTH VOLUME.

