THE ZOOLOGICAL RECORD.

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THE

ZOOLOGICAL RECORD

FOR 1883;

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VOLUME TWENTIETH

OF THE

RECORD OF ZOOLOGICAL LITERATURE.

EDITED BY

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

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Zoological Record Association

(FOUNDED 11 JANUARY, 1871;

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

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

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

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

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

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

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

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

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PREFACE.

I HAVE again to acknowledge 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.

Further changes will be noticed among the Recorders, Mr. S. O. Ridley's place in the *Spongiæ* being occupied by Prof. W. J. Sollas, and Mr. W. Saville-Kent's in the *Protozoa* by Prof. A. C. Haddon. It is a subject of regret that the other engagements of the Rev. O. P. Cambridge have not only prevented the delivering of his Record of *Arachnida* in time for insertion in this volume, but practically deprive us of his aid in future. The *Arachnida* for 1883 and 1884 will be given in the next volume, by Mr. T. D. Gibson-Carmichael.

EDWARD CALDWELL RYE.

ROYAL GEOGRAPHICAL SOCIETY,
1, Savile Row, Burlington Gardens, London,
January, 1885.

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

LIST OF THE

PRINCIPAL ABBREVIATED TITLES OF JOURNALS, &c., QUOTED IN THIS VOLUME.

Abh. Ak. Berl.—Abhandlungen der königlich preussischen Akademie der Wissenschaften zu Berlin.

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

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

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

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

Abh. Ges. Königsb.—Abhandlungen der k. physikalisch-ökonomischen Gesellschaft in Preussen (Königsberg).

Abh. sächs. Ges. — Abhandlungen der k. sächsischen Gesellschaft der Wissenschaften (Leipzig).

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

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

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

Act. Soc. Esp.—Actas de la Sociedad Española de Historia Natural (Madrid).

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).

Alb. Nat.—Album der Natuur (Harting: Haarlem).

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).

An. Mus. B. Aires—Anales del Museo publico, Buenos Aires.

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

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

Ann. Mus. Marseille—Annales du Musée d'Histoire Naturelle de Marseille. Zoologie (Marion: Marseilles).

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. Soc. Agric. Lyon—Annales de la Société d'Agriculture, Histoire Naturelle, et Arts utiles de Lyon (Lyons & Paris).

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

Ann. Soc. Géol. Nord—Annales de la Société géologique du Nord (Lille).

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 (Vienna).

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

Arb. Lab. Mosk. Univ.—Arbeiten des Laboratorium bei dem zoologischen Museum der Moskauer Universität (Moscow).

Arb. z. Inst. Wien—Arbeiten des zoologischen Instituts in Wien (Vienna).

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. Anthrop.—Archiv für Anthropologie: Zeitschrift für Naturgeschichte und Urgeschichte des Menschen (Brunswick).

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

Arch. f. Phys.—Physiologische Abtheilung des Archives für Anatomie und Physiologie (Arch. Anat. Phys.).

Arch. f. Thierheilk.—Archiv für Thierheilkunde.

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. 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.
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Arch. Z. expér.—Archives de Zoologie expérimentale et générale (Paris).
Atti Acc. Rom.—Atti della R. Accademia dei Lincei (Rome).
Atti Acc. Tor.—Atti della R. Accademia delle Scienze di Torino (Turin).
Atti Ist. Nap.—Atti del R. Istituto d'incorragiamento alle Scienze Naturali di Napoli (Naples).
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. Mod.—Atti della Società dei Naturalisti di Modena [new title of *Ann. Soc. Mod.*].
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.
Ausland—Das Ausland (Stuttgart).

Beitr. Morphol. Morphog.—Beiträge zur Morphologie und Morphogenie (Gerlach : Stuttgart).
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Beitr. Russ. Reiches (2)—Beiträge zur Kenntniss des Russichen Reiches und der angrenzenden Länder Asiens. Neue Folge (Helmersen & Schrenck : St. Petersburg).
Ber. Ges. Chemn.—Bericht der naturwissenschaftlichen Gesellschaft in Chemnitz.
Ber. Ges. Hanau = *JB. wetter. Ges.*
Ber. Ges. Leipzig — Berichte der naturforschenden Gesellschaft in Leipzig.
Ber. oberhess. Ges.—Bericht der oberhessischen Gesellschaft für Natur- und Heilkunde (Giessen).
Ber. offenb. Ver.—Bericht über die Thätigkeit des offenbacher Vereins für Naturkunde (Offenbach-on-the-Main).
Ber. Primärsch. Böhm.-Leipa—Bericht der Primärschule in Böhmisch-Leipa.
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B. E. Z.—Berliner entomologische Zeitscrift.
Bibl. univ.—Bibliothèque universelle et Revue Suisse (Geneva).
Bijdr. Taal-, &c., Ned. Indië (4)—Bijdragen tot de Taal-, Land-, en Volkenkunde van Nederlandsch Indië. 4de Volgreeks (The Hague).
Biol. Centralbl.—Biologisches Centralblatt (Rosenthal: Erlangen).
Bol. Ac. Arg.—Boletin de la Academia Nacional de Ciencias de la Republica Argentina (Cordoba).
Boll. scient.—Bollettino scientifico (Maggi, Zoja, & Giovanni: Pavia).
Boll. Soc. Adr.—Bollettino della Società Adriatica di Scienze naturali (Trieste).
Bot. Centralbl.—Botanisches Centralblatt. Referentes-Organ für das Gesammtgebeit der Botanik des In- und Auslandes (Uhlwein & Behrens: Cassel).
Bot. Z.—Botanische Zeitung (Halle).
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).
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Bull. U. S. Nat. Mus.—Bulletin of the United States National Museum (Washington).

Canad. Ent.—Canadian Entomologist (Saunders: Montreal).
Canad. Ent. (*n. s.*)—The Canadian Naturalist and Quarterly Journal of Science. New series (Montreal).
CB. Ges. Anthrop.—Correspondenzblatt der Deutschen Gesellschaft für Anthropologie, &c. (Brunswick).
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CB. Ver. Regensb.—Correspondenz-Blatt des zoologisch-mineralogischen Vereins in Regensburg (Ratisbon).
CB. Ver. Rheinl.—Correspondenz-Blatt des naturhistorischen Vereins der preussischen Rheinlande und Westphalens (Bonn).
Chrysanthemum—The Chrysanthemum: a Monthly Magazine for Japan and the Far East (Yokohama).

Circ. deutsch. Fisch. Ver.—Circulare des deutschen Fischerei-Vereins (Berlin).
Cist. Ent.—Cistula Entomologica (Janson : London).
Contr. E. M. Mus. Geol. Princeton—Contributions from the E. M. Museum of Geology, Princeton College, U.S.A. (Scott & Osborn).
C.R.—Comptes rendus des Séances hebdomadaires de l'Académie des Sciences (Paris).
C.R. Ass. Fr. Sci.—Compte-rendu de l'Association Française pour l'avancement des Sciences.
C.R. ent. Belg.—Comptes rendus des Séances de la Société entomologique de Belgique (Brussels).
C.R. Soc. Biol. (7)—Comptes rendus des Séances et Mémoires de la Société de Biologie. 7me série (Paris).

Denk. Ak. Wien—Denkschriften der k. Akademie der Wissenschaften zu Wien (Vienna).
Deutsche e. Z.—Deutsche entomologische Zeitschrift (Berlin).

Ent.—The Entomologist (London).
Ent. Ann.—The Entomologist's Annual (Stainton : 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).
Ért. Term. Kör.—Értekezések a természettudományok köréből, Magyar tudományos Akadémia [Memoirs on Natural Science, Hungarian Academy of Sciences] (Pesth).
Études d'Ent.—Études d'Entomologie, Faunes Entomologiques, Descriptions d'Insectes nouveaux ou peu connus (C. Oberthür : Rennes).

Feuill. Nat.—Feuille des jeunes Naturalistes (Paris).
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).
Geogr. JB.—Geographisches Jahrbuch (Gotha).
Geogr. MT.—Mitteilungen aus Justus Perthes' geographischer Anstalt (Gotha).
Geol. Mag.—Geological Magazine (Woodward : London).
Geol. Surv. Illin.—Geological Survey of Illinois.
Giorn. Sci. Palerm.—Giornale di Scienze naturali ed economiche di Palermo.

Hor. Ent. Ross.—Horæ Societatis Entomologicæ Rossicæ (St. Petersburg).
Humboldt—Humboldt : Monatsschrift für die gesammten Naturwissenschaften (Stuttgart).

Ibis—The Ibis (Salvin : London).

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

J. Applied Sci.—The Journal of Applied Science (Simmonds: London).

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

JB. Annab. Ver.—Jahresbericht des Annaberg-buchholzer Vereins für Naturkunde (Annaberg).

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

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

JB. Ges. Hannov.—Jahresbericht der naturforschenden Gesellschaft in Hannover.

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

JB. Laurent. Arnsberg—Jahresbericht über das königlichen Laurentianum in Arnsberg.

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

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

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

JB. Preuss. geol. Landes-Anstalt—Jahrbuch der Königlich Preussischen geologischen Landes-Anstalt (Berlin).

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

JB. sieb. Karpath. Ver.—Jahrbuch des siebenbürgischen Karpathen-Vereins (Hermannstadt).

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

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

JB. Ver. Osnabr.—Jahresbericht des naturwissenschaftlichen Vereins zu Osnabrück.

JB. Ver. Pass.—Jahresbericht der naturwissenschaftlichen Vereins in Passau.

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).

JB. wetter. Ges.—Jahresbericht der wetteranischen Gesellschaft für die gesammte Naturkunde (Hanau).

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

J. Comp. Med.—Journal of Comparative Medicine and Surgery (Conklin & Porter: New York).

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. Hopk. Univ. Circ.—Johns Hopkins University Circular (Baltimore).
JH. Ver. Lüneb.—Jahreshefte des naturwissenschaftlichen Vereins in Lüneberg.
J. L. S.—Journal of the Linnean Society, Zoology (London).
J. Microgr.—Journal de Micrographie (Pellétan : Paris).
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. Quek. Club—Journal of the Quekett Microscopical Club (London).
J. R. Agric. Soc. (2)—Journal of the Royal Agricultural Society. Second series (London).
J. R. 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).

Kolozsvári Orvos-term. társ. Értes.—Kolozsvári Orvos-természettudomanyi társulat Értesitö [Intelligencer of the Society of Medical and Natural Science, Kolozsvár].
Kosmos—Kosmos : Zeitschrift für einheitliche Weltauschauung auf Grund der Entwickelungslehre.

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).
Math. Nat. Ber. Ung.—Mathematische und naturwissenschaftliche Berichte aus Ungarn. Mit Unterstützung der Ungarischen Akad. d. Wiss. und der K. Ungar. naturwiss. Ges. herausgegeben von Baron R. Eötvös, &c. (Fröhlich : Berlin).
Medd. Soc. Fenn.—Meddelanden af Societatis pro Fauna et Flora Fennica (Helsingfors).
Mél. Biol.—Mélanges biologiques tirés du Bulletin de la classe physico-mathématique de l'Académie Impériale des Sciences (St. Petersburg).
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.

Mém. Ac. Sci.—Mémoires de l'Académie des Sciences (Paris).

Mém. Ac. Toulouse—Mémoires de l'Académie des Sciences, &c., de Toulouse.

Mém. Ac. Vaucluse—Mémoires de l'Académie de Vaucluse.

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

Mem. Inst. Genév.—Mémoires de l'Institut national Genévois (Geneva).

Mem. Ist. Venet.—Memorie del R. Istituto Veneto di Scienze, &c. (Venice).

Mém. Liége—Mémoires de la Société Royale des Sciences de Liége.

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

Mém. Soc. Aube—Mémoires de la Société Académique d'agriculture, des sciences, arts, et belles lettres du département de l'Aube (Troyes & Paris).

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. ém. Doubs—Mémoires de la Société d'émulation du Doubs (Besançon).

Mem. Soc. geogr. Ital.—Memorie della Società geografica Italiana (Rome).

Mem. Soc. Géol. (3)—Mémoires de la Société Géologique de France. 3me série (Paris).

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

Mém. Soc. Nouv. Russ.—Mémoires de la Société des Naturalistes de la Nouvelle Russie (Odessa).

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

Mém. Soc. Seine & Oise—Mémoires de la Société des Sciences naturelles de Seine-et-Oise (Versailles).

Mem. Univ. Tokio—Memoirs of the Science Department, Tokio Daigaku (University of Tokio).

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. anthrop. Ges. Wien—Mittheilungen der anthropologischen Gesellschaft in Wien (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. Münch. ent. Ver.—Mittheilungen des Münchener entomologischen Vereins.

MT. orn. Ver. Wien—Mittheilungen des ornithologischen Vereins in Wien (Vienna).

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

MT. Thurgau. Ges.—Mittheilungen der Thurgauischen naturforschenden Gesellschaft (Frauenfeld).

MT. Ver. Frankfurt-a.-O.—Monatliche Mittheilungen des naturwissenschaftlichen Vereins des Regierung-Bezirkes, Frankfurt-an-der-Oder.

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

N. Act. Ups.—Nova Acta R. Societatis Scientiarum Upsaliensis (Upsala).

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

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

Nat. Hist. N.—Natural History Notes (Rowbotham: London).

Nat. Mex.—La Naturaleza (Mexico).

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

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

Natur—Die Natur: Zeitung zur Verbreitung naturwissenschaftlichen Kenntniss und Naturauschauung 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.

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).

Notizbl. Ver. Erdk. Darmstadt—Notizblatt des Vereins für Erdkunde zu Darmstadt.

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 (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).

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.

Pal. Abh. — Palæontologische Abhandlungen (Dames & Kayser: Berlin).

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.

P. Am. Micr. Soc.—Proceedings of the American Microscopical Society.

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. Belf. Soc.—Proceedings of the Belfast Natural-history and Philosophical Society.

P. Birmingh. Phil. Soc.—Proceedings of the Birmingham Philosophical Society.

P. Birmingh. Soc.—Proceedings of the Natural-history and Microscopical Society, Birmingham.

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

P. Cambr. Phil. Soc.—Proceedings of the Philosophical Society, Cambridge.

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

P. Davenport Ac.—Proceedings of the Davenport Academy of Natural Science (Davenport, Iowa).

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

P. Geol. Ass.—Proceedings of the Geologists' Association (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. L. S.—Proceedings of the Linnean Society (London).

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

P. Nebraska Ass.—Proceedings of the Nebraska Association for the Advancement of Science.

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

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

P. Perthsh. Soc.—Proceedings of the Perthshire Society of Natural Science (Perth).

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.

P. R. Inst.—Proceedings of the Royal Institution of Great Britain (London).

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

Prodr. Zool. Vict.—Prodromus of the Zoology of Victoria (McCoy: Victoria).

Protok. nat. Ges. Kazan—Protokol der naturforschenden Gesellschaft, Kazan [Proceedings of the Society of Naturalists at the Imperial Kazan University].

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

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

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

P. Somerset. Soc.—Proceedings of the Somersetshire Archæological and Natural History Society. New series (Taunton).

Psyche—Psyche, a Journal of Entomology. Published by the Cambridge Entomological Club (Cambridge, Mass., U.S.A.).

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

P.-v. Soc. Mal. Belg.—Procès-verbaux des séances de la Société malacologique de Belgiques (Brussels).

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

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

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

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

Rec. Z. Suisse—Recueil Zoologique Suisse (Fol: Geneva & Bâle).

Rend. Acc. Nap.—Rendiconti dell' Accademia di Scienze fisiche e matematiche di Napoli.

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

Rep. Cornell Univ. Stat.—Report of the Department of Entomology of the Cornell University Experiment Station (Comstock: Ithaca, N. Y.).

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

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

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

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

Rep. Ins. Illin.—Annual Report on the Noxious and Beneficial Insects of the State of Illinois (Springfield).

Rep. Ins. N. York—Annual Report of the Injurious and other Insects of New York (Lintner: Albany).

Rep. Leicest. Soc.—Report of the Leicester Literary and Philosophical Society.

Rep. Marlb. Coll. Soc.—Report of the Marlborough College Natural History Society.

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

Rep. Rugby Soc.—Report of the Rugby School Natural History Society.

Rep. U. S. Ent. Comm.—Report of the United States Entomological Commission (Washington).

Rep. U. S. Fish Comm.—Report of the Commissioners, United States Commission of Fish and Fisheries (Washington).

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

Rep. W. Kent Soc.—Papers and Reports, &c., of the West Kent Natural History, Microscopical, and Photographic Society (Greenwich).

Rep. Wisc. Geol. Surv.—Report of the Wisconsin Geological Survey (Madison).

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

Rev. mens. Ent.—Revue mensuelle d'Entomologie pure et appliquée (Doukhtouroff: St. Petersburg).

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

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

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

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

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

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

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

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

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

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

SB. Ges. Königsb.—Sitzungsberichte der k. physikalisch-ökonomischen Gesellschaft in Preussen (Königsberg).

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

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

SB. Ges. Münch.—Sitzungsberichte des mathematisch-physikalischen Classe der k. k. Akademie der Wissenschaften zu München (Munich).

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

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

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

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

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

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

Schr. Ges. Königsb.—Schriften der k. physicalisch-ökonomischen Gesellschaft in Preussen (Königsberg).

Schr. nat. Kenntn.—Schriften des Vereines zur Verbreitung naturwissenschaftliche Kenntnisse in Wien (Van Nahlik: Vienna).

Science—Science (Dall: Cambridge, Mass.).

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

Science Obs.—Science Observer (Boston Scientific Society, U.S.A.).

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

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

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

Sprawozd. Kom. fizyjogr.—Sprawozdanie Komisyi fizyjograficznéj, &c. (Cracow).

Str. Feath.—Stray Feathers (Calcutta).

Stud. Biol. Lab. J. Hopkins Univ.—Studies at the Biological Laboratory of the Johns 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).

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).

Timehri—Timehri: being the Journal of the Royal Agricultural and Commercial Society of British Guiana (Im Thurn: Demerara).

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

Tr. A. S. Japan—Transactions of the Asiatic Society of Japan (Yokohama.)

Trav. Ac. Rheims—(Publication des) Travaux de l'Académie des Sciences, Belles-lettres, et Arts, Rheims.

Trav. Lab. Histol.—Travaux du Laboratoire d'Histologie du Collège de France, École pratique des Hautes Études (Ranvier : Paris).

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

Tr. Edinb. Nat. Club—Transactions of the Edinburgh Naturalists' Field Club.

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

Tr. L. S. (2)—Transactions of the Linnean Society, London. Second series.

Tr. North. Durh.—Natural-History Transactions of Northumberland and Durham (Newcastle-on-Tyne).

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.

Tr. Ottawa Nat. Club—Transactions of the Ottawa Field-Naturalists' Club.

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

Tr. R. Irish Ac.—Transactions of the Royal Irish Academy (Dublin).

Tr. R. Soc. Canada—Proceedings and Transactions of the Royal Society of Canada (Montreal).

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. R. Soc. Vict.—Transactions of the Royal Society of Victoria.

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

Trud. Nat. Ges. Kharkow = *Tr. Soc. Univ. Kharkow.*

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

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

Verh. Ak. Amst.—Verhandelingen der koninklijke Akademie van Wetenschappen (Amsterdam).

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

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

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

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

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

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

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

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

Wiadomosci z nauk przyrod. = Materialen zu dem Wissenschaften (Warsaw).

Wien. ent. Z.—Wiener entomologische Zeitschrift (Vienna).

Young Nat.—The Young Naturalist (Morley: Huddersfield).

Zapiski Novoross. Obsch. Estestv. = *Mém. Soc. Nouv. Russ.*

Z. f. Ethnol.—Zeitschrift für Ethnologie (Bastian & Hartmann: Berlin).

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

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

Z. ges. Naturw. (4) = *Z. Naturw.*

Z. Naturw. — Zeitschrift für Naturwissenschaften. Original Abhandlungen und Berichte herausgegeben im Auftrage der naturwissenschaftlichen Vereins für Sachsen und Thüringen (Brass: Halle-a.-S.).

Znan. i Umjet., Rad. jugoslav. Ak.—Znanosti i umjetnosti, Rad jugoslavenske Akademije (Zagreb) [Knowledge and Science, Council of the South Sclav Academy].

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

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

Zool. Beitr.—Zoologische Beiträge (Schneider: Breslau).

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

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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* This volume, which contains no *Arachnida*, is 28 pages shorter than its predecessor, in which that Class occupied 33 pages.

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ERRATA.

AVES, p. 17, line 8, for "STEPHENSON," read "STEVENSON."
„ p. 22, line 22, for "[*Myedestes*]," read "[*Myiedestes*]."
REPTILIA, p. 6, line 4, for "[*Racheot-*]," read "[*Rhacheot-*]."
„ p. 10, line 7, for "Tor." read "Tosc."
PISCES, p. 10, line 20, for "*Acondylacanthus*, g. n.," read "*Acondylacanthus*, St. John & Worthen, Geol. Surv. Illin. vi. 1875."
„ p. 10, line 36, for "*Pnigeacanthus*, g. n.," read "*Pnigeacanthus*, St. John & Worthen, Geol. Surv. Illin. vi. 1875."
„ p. 16, line 26, for "Tor." read "Tosc."
MOLLUSCA, p. 39, line 12, for "*Sandbergenoceras*," read "*Sandbergeroceras*."
„ pp. 51, 52, & 54, to references of Monterosato, Nat. Sicil. iii. [*Tricoliella*, *Jujubinus*, *Gibbulastra*, and *Patellastra*, gg. nn.], add "[publ. January, 1884]."
CRUSTACEA, p. 27, line 7 from bottom, for "*Boeckia*, g. n.," read "*Boeckia* [Zool. Rec. 1882]."
„ p. 28, line 5 from bottom, for "*Diarthrodes*, g. n.," read "*Diarthrodes* [Zool. Rec. 1882]."
„ p. 29, line 4 from top, for "*Xouthous*, g. n.," read "*Xouthous* [Zool. Rec. 1882]."
„ p. 30, line 1, for "*Conostoma*, g. n.," read "*Conostoma* [Zool. Rec. 1882]."
INSECTA, p. 21, line 16, for "*Plectroscelis*." read "*Phylloscelis*."
„ p. 23, line 13, for "**Habroscelis*," read "*Habroscelis* (Hope)."
„ p. 120, line 2, and p. 121, lines 23 and 26, all from bottom, for "*Eulytus*," read "*Endytus*.
„ p. 194, bottom line, for "*fayi*," read "*fagi*."
„ p. 207, top line, to *Metalepsis*, add "(Grote, 1875)."
„ p. 235, bottom line, for "Veterinarian, 1883, pp. 8," read "Veterinarian, (4) lvi. pp. 10–12, 81–83, 156–159, 234–236, & 307–310."
„ p. 289, line 5, for "Mem." read "Bull."
VERMES, p. 12, bottom line, for "*Triceratia*, g. n.," read "*Triceratia* [Zool. Rec. 1882]."

Mamm. 1

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ZOOLOGICAL RECORD

FOR 1883.

MAMMALIA.

BY

OLDFIELD THOMAS, F.Z.S., NATURAL HISTORY MUSEUM.

THE year 1883 is, so far as Mammals are concerned, chiefly marked by the large number of palæontological papers and books which have been published, among which those of Ameghino (p. 2), Cope (pp. 6 & 7), Filhol (p. 9), and Lydekker (p. 16) are the most prominent. Flower (p. 9) has published many important systematic papers, his Encyclopædia article, "*Mammalia*," giving one of the best existing accounts of *Mammalia* generally, while his "Arrangement of the Orders and Families of existing *Mammalia*" forms a distinct advance towards a permanent and rational classification of the group. Dobson (p. 8) has continued his Anatomical and Systematic Monograph of the *Insectivora*; and other anatomical work has been done by Ercolani (p. 9), Lankester (p. 58), Poulton (p. 20), Spoof (p. 22), and others. Faunal papers, mostly of minor importance, have been put forth by Jentink (p. 14), Mojsisovics (p. 17), Von Pelzeln (p. 19), Stearns (p. 23), and others. 36 new recent species have been described, as compared with 46 in 1882 and 36 in 1881.

THE GENERAL SUBJECT.

ACKERMANN, C. Beiträge zur physischen Geographie der Ostsee. Hamburg: 1883, 8vo.

Contains, p. 354, notes on the seals and whales of the Baltic.

Adams, A. Leith, Kinahan, G. H., & Ussher, R. J. Explorations in the Bone Cave of Ballynamintra, near Cappagh, County Waterford. Tr. R. Dubl. Soc. i. [1881] p. 177.

Contains a list by Dr. Leith Adams of the Mammals found in these caves. [Omitted from Zool. Rec. xviii.]

Aeby, —. [See *Primates*.]

Albrecht, P. Das os intermedium tarsi der Säugethiere. Zool. Anz. vi. p. 419.

A note on K. Bardeleben's paper (see below), with a figure of a human astragalus, showing the os trigonum.

——. Sur la valeur morphologique de l'articulation mandibulaire du cartilage de Meckel et des osselets de l'ouïe, avec essai de prouver que l'écaille du temporal des Mammifères est composée primitivement d'un squamosal et d'un quadratum. Bruxelles : 1883.

[Not seen by Recorder. *Cf.* A. Dollo, Q. J. Micr. Sci. xxiii. p. 579; see also *Manatidæ*, *Edentata*.]

——. Sur les copulæ intercostoidales et les Hemisternoides du sacrum des Mammifères. Bruxelles : 1883, 8vo, pp. 24.

[Not seen by Recorder. *Cf.* Zool. Anz. vii. p. 331.]

Allen, H. On Cutaneous Nerves in Mammals. P. Ac. Philad. 1883, p. 127.

A short note on "the trophic value of the cutaneous nerves."

Ameghino, F. Sobre una coleccion de Mamíferos fósiles del piso Mesopotamica de la formacion Patagonica. Bol. Ac. Arg. v. p. 101.

Many new genera and species are described ; see *Lagostomus antiquus*, sp. n. (*Chinchillidæ*), *Hydrochœrus paranensis*, sp. n. (*Caviidæ*), *Toxodontherium compressum*, g. & sp. nn. (*Toxodontidæ*), *Scalabrinitherium bravardi*, g. & sp. nn. (*Palæotheriidæ*), *Ribodon limbato*[*-tus*], g. & sp. nn. (*Macraucheniidæ*), *Mylodon paranense*[*-sis*], sp. n. (*Megatheriidæ*), *Chlamydotherium paranense*, sp. n., *Glyptodon* (?) *antiquus*, sp. n., *Hoplophorus paranense*[*-sis*], sp. n. (*Glyptodontidæ*).

——. Sobre una nueva coleccion de Mamíferos fósiles, recogidos por el Profesor Scalabrini en las barrancas del Parana. Bol. Ac. Arg. v. p. 257.

See *Megamys laurillardi*, sp. n., and *Cardiatherium dæringi*, g. & sp. nn. (*Cariidæ*), *Oxyodontherium zeballosi*, g. & sp. nn. (*Macraucheniidæ*), *Brachytherium cuspidatus*[*-tum*], sp. n., *Proterotherium cervioides*, g. & sp. nn. (*Anoplotheriidæ*), *Promegatherium smaltatus*[*-tum*], g. & sp. nn., *Promylodon*, g. n., *Olygodon*[*Olig-*] *pseudolestoides*, g. & sp. nn. (*Megatheriidæ*), *Palæhoplophorus*, g. n. (*Glyptodontidæ*).

——. [See also Gervais and *Glyptodontidæ*.]

Anderson, J. Guide to the Calcutta Zoological Gardens. Calcutta : 1883, 8vo, pp. 181.

Contains numerous popular notes on the habits in confinement of the Mammals exhibited in the Gardens.

ANDERSON, R. J. [See *Elephas africanus* (*Elephantidæ*).]

ANDREWS, R. R. [See *Suidæ*.]

ANUČINA, D. N. [See *Canidæ*.]

ARLOING, J. [See *Equidæ*.]

ARSTINGSTALL, G. [See *Elephantidæ*.]

BAGINSKY, B. Zur Physiologie der Gehörschnecke. SB. Ak. Berl. 1883, p. 685.

BAKER, F. Remarks on the Morphology of Arteries, especially those of the limbs. Am. Nat. xvii. p. 505, pls. viii.-xi.; abstract in P. Am. Ass. xxxi. p. 488.

The author propounds the theory that all the chief varieties of arterial ramification, especially those of the limbs, can be reduced to the general archetypal plan prefigured by the radiate fin of fishes.

BARDELEBEN, K. Das os intermedium tarsi der Säugethiere. Zool. Anz. vi. p. 278.

Shows that an intermedium is very generally present in the tarsus of five-toed Mammals, being represented by the posterior process of the astragalus. It is named the os trigonum, and a table of the homologies of the carpal and tarsal bones is appended.

BASSERIE, —. [On the Domestic Animals of Camargue.] Bull. Soc. Sarthe, xxviii. p. 521.

The domestic animals of this island, situated at the mouth of the Rhone, are said all to be small, hardy, and energetic. [Not seen by Recorder; *cf.* Science, i. p. 317.]

BAYBERGER, F. Der Inngletscher von Kufstein bis Haag. Geogr. MT. Ergänzungsband xv. pt. 70.

Contains (p. 62) remarks on the Bavarian Mammals of the Glacial period.

BAYERL, B. Die Entstehung rother Blutkörperchen im Knorpel am Ossificationsrande. Arch. mikr. Anat. xxiii. pp. 30–44, pl. iii.

BEAUREGARD, H. [See *Balænidæ*.]

BEEVOR, C. Die Kleinhirnrinde. Arch. Anat. Phys. (Phys.) 1883, p. 365, pl. v.

BELTZOW, —. Ueber die Regeneration der Sehnen. Nachr. Ges. Gött. 1883, p. 191.

BERNSTEIN, H. H. Dagboek van Dr. H. A. Bernstein's laatste Reis van Ternate naar Nieuw-Guinea, Salawatti en Batanta, 17 October, 1864, – 19 April, 1865; bewerkt door Mr. S. C. J. W. van Musschenbroek. Bijdr. Taal-, &c., Ned. Indië (4) vii. pp. 1–258, map; also separately, The Hague: 1883, 8vo.

Although chiefly ornithological, Dr. Bernstein's diary contains many incidental observations on the Mammals collected by him.

Bizzozero, J., & Torre, A. A. De l'origine des corpuscules sanguins rouges dans les différentes classes des Vertébrés. Arch. Ital. Biol. iv. pp. 309–329.

——, ——. Formation des corpuscules sanguins rouges (appendice à l'étude précédente). *L. c.* pp. 329–345.

——, ——. D'un nouvel élément morphologique du sang, et de son importance dans la thrombose et dans la coagulation. *Op. cit.* iii. p. 94.

A continuation of the paper noted Zool. Rec. xix. *Mamm.* p. 2.

Blakiston, T. W. Zoological Indications of Ancient Connection of the Japan Islands with the Continent. Tr. A. S. Japan, xi. p. 126.

Many of the "indications" are drawn from the Mammals of Japan.

Blanchard, R. [See Regnard.]

Blomfield, J. E. Review of Recent Researches on Spermatogenesis. Q. J. Micr. Sci. xxiii. pp. 320–335.

Reviews the papers on this subject published by Duval, Renson, Herrmann, Sabatier, and von Brunn, and shows how similar the process of spermatogenesis in Mammals is to that which takes place in the *Mollusca*.

Boas, J. E. V. Bidrag till Opfattelsen af Polydaktyli hos Pattedyrene. Vidd. Medd. 1883.

[Not seen by Recorder. *Cf.* Zool. Anz. vii. p. 331.]

Bocage, J. V. Barboza du. [See *Genetta angolensis* (*Viverridæ*), *Macroscelides brachyura* (*Macroscelididæ*), and *Euryotis anchietæ* (*Muridæ*), spp. nn.]

[Accidentally omitted from the specific part of Zool. Rec. xix., although referred to under "General Subject."]

Born, G. Ueber die Derivate der embryonalen Schlundbogen und Schlundspalten bei Säugethieren. Arch. mikr. Anat. xxii. pp. 271–314, pls. x. & xi. [*cf.* Zool. Rec. xix. *Mamm.* p. 3.].

Boulart. R. [See *Delphinidæ*.]

Branco, W. Ueber eine fossile Säugethier-Fauna von Punin bei Riobamba in Ecuador. Pal. Abh. i. Heft 2, pp. 19–160, pls. i.–xix.

An important and finely-illustrated work on the rich collection of fossils made by W. Reiss in Ecuador. Long accounts are given of the osteology of certain fossil Mammals [see *Machærodus neogæus* (*Felidæ*), *Equus andium* (*Equidæ*), and *Protauchenia reissi*, g. & spp. nn. (*Camelidæ*)], and a comparison is instituted between the tertiary and quaternary beds of the Old and New Worlds.

Brauns, D. Ueber japanische diluviale Säugethiere. Z. geol. Ges. xxxv. pp. 1–58.

Consists of notes and descriptions of the remains of various Ungulates, chiefly elephants, found fossil in Japan, with deductions as to the age of the strata in which they were found. [See also Lydekker, R.]

[Brauns, D.] Geology of the Environs of Tokio. Mem. Univ. Tokio, No. 4, 1881.

Brenner, A. Ueber das Verhältniss des Nervus laryngeus inferior vagi zu einigen Aortenvarietäten des Menschen und zu dem Aortensystem der durch Lungen athmenden Wirbelthiere überhaupt. Arch. Anat. Phys. (Anat.) 1883, pp. 373–396, pl. xvii.

Brooks, W. T. [See *Primates*.]

Brown, A. E. [See *Primates*.]

Brown, J. T. [See *Cetacea*.]

Bruce, A. T. Observations upon the Brain-casts of Tertiary Mammals. Contr. E. M. Mus. Geol. Princeton, No. 3, p. 36.

[Not seen by Recorder ; *cf.* Zool. Anz. vii. p. 158.

Brühl, C. B. Zootomie aller Thierklassen. Lief. 25 (Cerebrum Mammalium—Carnivora). Wien : 1882, 4to.

[Not seen by Recorder ; se. Arch. f. Nat. xlix. p. 387.]

Brunn, A. von. Beiträge zur Kenntniss der Samenkörper und ihrer Entwicklung bei Säugethieren und Vögeln. Arch. mikr. Anat. xxiii. pp. 108–132, pl. vii. A.

Brunton, T. L., & Cash, T. The Valvular Action of the Larynx. J. Anat. Phys. xvii. p. 363.

The authors show that, where both are present, the function of the false, or "ventricular," vocal cords is to prevent air from leaving the thorax, while that of the true cords is to keep it out; and that in those Mammals, such as man, the cats, bears, &c., in which the anterior limbs are used, not only for progression, but for striking, climbing, or performing other more or less delicate offices, and in which, therefore, it is necessary for the thorax to be at times fixed and rigid, the ventricular cords, which prevent the exit of air, are strongly developed ; while in those, such as the Ungulates, which are purely quadrupedal, they are very small or absent.

Bunge, A. Naturhistorische Nachrichten aus der Polarstation an der Lena-Mündung. Mél. biol. xi. p. 581.

Contains notes on the Mammals observed at the mouth of the Lena; among others, on *Ursus maritimus*, *Vulpes lagopus*, *Rangifer tarandus*, and *Ægoceros montanus*.

Burmeister, H. [See *Dasypodidæ*.]

Cadiat, —. Du développement des fentes et arcs branchiaux chez l'embryon. J. de l'Anat. Phys. xix. pp. 38–58, pls. v.–viii.

Calori, L. Intorno al processo sopracondiloideo interno del femore nei Mammiferi e nell' Uomo. Mem Acc. Bologn. (4) iv. p. 585.

Notes on the supra-condyloid process of the femur in various Mammals, with two plates.

Caruccio, A. Vertebrati del Modenese. Ann. Soc. Mod. (2) xv. p. 130, and Atti Soc. Mod. (3) i. Appendix, p. 1.

A list of the Mammals of Modena, 39 in number, is given on p. 150 of the first reference, and notes on their distribution, rarity, &c., in the second.

Chabry, L. [See *Delphinidæ*.]

Chatin, J. [See *Rodentia*.]

Chauveau, A. L'Anatomie comparée des Animaux domestiques. Paris: 1883, new edition.

[Not seen by Recorder; *cf.* "Zootomy," by F. J. Parker, 1884, p. 381.]

Cleland, J. [See *Delphinidæ*.]

Cockburn, J. [See *Rhinoceros indicus* (*Rhinocerotidæ*).]

Cope, E. D. On the Zoological Position of Texas. Bull. U. S. Nat. Mus. No. 17.

Contains notes on the more important Mammals of Texas.

——. The Evidence of Evolution in the History of the Extinct *Mammalia*. Science, ii. p. 272.

A semi-popular paper on the principles of evolution, based on the fossil Mammals of N. America.

——. On the Mutual Relations of the Bunotherian *Mammalia*. P. Ac. Philad. 1883, p. 77.

This Order is divided into the following sub-orders and families:—

Tæniodonta. *Calamodontidæ*, *Ectoganidæ*.
Tillodonta. *Tillotheriidæ*.
Daubentonioidea. *Chiromyidæ*.
Prosimiæ. *Tarsiidæ* (?), *Anaptomorphidæ* (?), *Mixodectidæ*, *Lemuridæ*.
Insectivora. *Soricidæ*, *Erinaceidæ*, *Macroscelididæ*, *Tupaiidæ*, *Adapidæ*, *Arctocyonidæ*.
Creodonta. *Talpidæ*, *Chrysochloridæ*, *Esthonychidæ*, *Centetidæ* (= *Leptictidæ*), *Oxyænidæ*, *Miacidæ*, *Amblyctonidæ*, *Mesonychidæ*.

The number and arrangement of the cusps on the molars are chiefly used as characters for these groups. [See also Ann. N. H. (5) xii. p. 20.]

——. Synopsis of the Vertebrata of the Puerco Eocene Epoch. P. Am. Phil. Soc. xx. p. 461; abstract in P. Am. Ass. xxxi. p. 479.

Of the 45 fossil *Mammalia* enumerated, 5 are Marsupials, 15 *Bunotheria*, and 25 *Condylarthra*. Several new species are described, and the synonomy of the others is worked out. [See *Hyopsodus acolytus*, sp. n. (*Lemuravidæ*), *Deltatherium baldwini*, sp. n. (*Leptictidæ*), *Didymictis haydenianus*, sp. n. (*Miacidæ*), *Periptychus ditrigonus* and *interruptus*, *Haploconus xiphodon*, *Conorycles crassicuspis*, spp. nn. (*Periptychidæ*), *Mioclænus minimus*, sp. n. (*Leptictidæ*).]

[Cope, E. D.] First Addition to the Fauna of the Puerco Eocene. P. Am. Phil. Soc. xx. p. 545.

Further remains of old, and several new, species are described. [See *Triisodon levisianus*, *Mioclænus ferox*, *bucculentus*, and *corrugatus* (*Leptictidæ*), *Mixodectes pungens* and *crassiusculus* (*Mixodectidæ*), and *Phenacodus calceolatus* (*Phenacodontidæ*), spp. nn.]

——. Second Addition to the Knowledge of the Puerco Epoch. P. Am. Phil. Soc. xxi. pp. 309–324 [January, 1884].

Based on further collections from the Puerco beds. The present paper consists almost entirely of descriptions of new genera and species. [See *Tricentes crassicollidens* and *inæquidens* (*Mixodectidæ*), *Indrodon malaris* (*Lemuravidæ*), *Mioclænus cuspidatus*, *Oxyclænus*, *Triisodon rusticus* and *assurgens*, and *Chriacus truncatus* and *simplex* (*Leptictidæ*), *Didymictis primus* (*Miacidæ*), *Anisonchus agapetillus* and *cophater* (*Periptychidæ*), and *Chirox plicatus* and *Catopsalis fissidens* (*Plagiaulacidæ*).] The paper ends with remarks on the general dental characters of the Puerco *Mammalia*.

——. On the Tritubercular Type of Superior Molar Teeth. P. Ac. Philad. 1883, p. 56; Am. Nat. xvii. p. 407; and P. Am. Phil. Soc. xxi. p. 324.

——. On the Discovery in Dakota of a new Fossiliferous Bed of the "White River" Epoch. P. Am. Phil. Soc. xxi. p. 216.

Remains of 14 Mammals were found.

——. [See also *Mixodectidæ*, *Carnivora*, *Canidæ*, *Rodentia*, *Ungulata*, *Coryphodontidæ*.]

Coppinger, R. W. Cruise of the 'Alert'; four years in Patagonian, Polynesian, and Mascarene waters. London: 1883, 8vo, pp. 256.

Contains incidental notes on the more common Patagonian Mammals.

Cornevin, C. Étude sur les os Wormiens des animaux domestiques. Rev. d'Anthrop. (2) vi. p. 661.

The author finds that in domestic animals the Wormian bones, which are generally facial, are most numerous in the less highly bred races, being very rare in pure breeds, while, on the other hand, in man, where they are nearly invariably cranial, they increase in number in the higher races. He also entirely denies that they are in any way instances of atavism.

Coues, E. [See *Muridæ*, *Bovidæ*, *Antilocapridæ*.]

Cunningham, D. J. The Development of the Suspensory Ligament of the Fetlock in the Fœtal Horse, Ox, Roe Deer, and Sambre Deer. J. Anat. Phys. xviii. p. 1.

A continuation of the researches already noted [see Zool. Rec xv. *Mamm.* p. 3, and xix. *Mamm.* p. 5]. The author confirms the muscular origin of this ligament, showing the processes by which it has been developed, and states that in all cases the ligament of the hind foot is further advanced than that of the fore, there being invariably more muscular fibres remaining in the anterior than in the posterior ligament.

Cybulsky, J. B. [See *Bovidæ*.]

Dames, W. Ueber eine tertiäre Wirbelthierfauna von der westlichen Insel des Birket-el-Qurun im Fajum (Egypt). SB. Ak. Berl. 1883, p. 129.

[See *Zeuglodontidæ*.]

——. [See also *Bovidæ*.]

Dawson, J. W. [See *Balænidæ*.]

Decker, F. Ueber den Primordialschädel einiger Säugethiere. Z. wiss. Zool. xxxviii. pp. 190–233, pl. ix.

The author traces the early development of the skull in the ox, sheep, pig, cat, armadillo, bear, seal, and pangolin, and discusses the vertebral theory of the skull from a developmental point of view.

Depéret, —. [See *Artiodactyla*.]

De Vis, C. W. [See *Marsupialia*, *Macropodidæ*, *Belideus gracilis*, sp. n. (*Phalangistidæ*).]

Diesing, R. Beiträge zur Kenntniss der Haarbalgmuskeln. Beitr. Morphol. Morphog. i. p. 50.

Worked out in the human subject.

Dobson, G. E. A Monograph of the *Insectivora*, Systematic and Anatomical. Part II. London: 1883, 4to.

[See *Insectivora*, infrà, p. 33.]

Doederlein, D. [See *Leporidæ*.]

Dollo, M. L. On the Malleus of the *Lacertilia*, and the Malar and Quadrate Bones of *Mammalia*. Q. J. Micr. Sci. xxiii. pp. 579–596, pl. xli.

The author believes (1) that he has discovered in the *Lacertilia* a true malleus homologous with that of Mammals, and that therefore the Mammalian malleus cannot be, as is commonly thought, the homologue of the quadrate of the lower vertebrates; (2) that the zygomatic portion of the squamosal of the *Mammalia* is the true homologue of the quadrate; and (3) that morphologically the Mammalian malar equals the post-frontal jugal and quadrato-jugal of the lower vertebrates combined. [See also Albrecht, P., *suprà*.]

Dugès, A. Observations on Four Mules in Milk. P. U. S. Nat. Mus. v. p. 223 [1882: translated from Dugès's French version of a Spanish note in the Mexican publication 'El Repertorio,' No. xvii. 1876].

The milk obtained from virgin mules was analysed and found to be identical with ordinary mare's milk.

Duns, —. On the Zoology of Mid-Lochaber. P. Phys. Soc. Edinb. vii. pt. i. p. 156.

A list of Mammals is given.

Eichbaum, F. [See *Equidæ*.]

Eimer, T. Ueber die Zeichnung der Vögel und Säugethiere. JH. Ver. Württ. xxxix. p. 56, and Zool. Anz. v. p. 685, & vi. p. 690.

The author discusses the arrangement of the markings on Mammals and Birds, and comes to the conclusion that their evolution consists of

three stages : (1) longitudinal striping, (2) the breaking up of the stripes into spots, and (3) the arrangement of the spots into transverse rows and bands. [See also J. Sci. (3) v. p. 633 ; J. R. Micr. Soc. (2) iii. p. 631 ; and Science, ii. p. 144.]

Emery, C. Recherches embryologiques sur le rein des Mammifères. Arch. Ital. Biol. iv. pp. 80–92.

Ercolani, G. B. Della polidactylia e della polimelia nell' uomo e nei vertebrati. Mem. Acc. Bologn. (4) iii. pp. 727–828, pls. i.–iv.

A finely illustrated memoir on polydactyly in Man and other Vertebrates, with special reference to domestic Mammals.

——. Nuove ricerche di anatomia normale e patologica sulla placenta dei Mammiferi e della donna. Mem. Acc. Bologn. (4) iv. pp. 707–782, with 3 pls., and Arch. Ital. Biol. iv. p. 179 (abstract).

On the normal and pathological anatomy of the placenta. [*Cf.* also C. S. Minot, Science, ii. p. 804.]

Feuerstack, W. Die Entwicklung der rothen Blutkörperchen. Z. wiss. Zool. xxxviii. pp. 136–164.

Filhol, H. Notes sur quelques Mammifères fossiles de l'époque miocène. Arch. Mus. Lyon, iii. pp. 1–97.

A notice of this important paper on Eocene Mammals was inserted last year from Ann. Sci. Nat., but certain of the new species were missed, and they are therefore now included. [See *Viverra leptorhyncha* and *Herpestes crassus* (*Viverridæ*), and *Plesictis mutatus* (*Mustelidæ*), spp. nn.]

——. Mémoires sur quelques Mammifères fossiles des phosphorites du Quercy. Toulouse : 1882, 8vo, pp. 140, pls. i.–x.

A valuable work, illustrated with excellent figures, on some of the more interesting of the numerous fossils discovered in the Upper Eocene deposits of Quercy. Like the last, it was quoted in the 1882 Record from other notices, but these having been too incomplete for proper reference, its contents are now noted in their proper places.

——. Observations relatives au mémoire de M. Cope, intitulé "Relation des Horizons renfermant des débris d'animaux vertébrés fossiles en Europe et en Amerique." Ann. Sci. géol. xiv. Art. 5, pls. x.–xii.

An important discussion on the relations between the fossil Mammals of Europe and America.

Fletcher, J. J. [See *Marsupialia*.]

Flower, W. H. "*Mammalia*" in Encyclopædia Britannica, xv. pp. 347–446.

This is, for systematic zoology, by far the most important publication of the year, as it contains an excellent original account (1) of the general anatomy, osteology, development and distribution of Mammals, and (2) of the members and classification of the various orders. The fossil are treated in connection with the recent forms, and there is a section devoted to the Mesozoic Mammals, which do not fall naturally into any of the recent orders. In the systematic part, the anatomy and palæont-

ology of each order is fully described, and the sub-orders, families, and genera are all properly arranged and characterized, and the whole is illustrated with a large number of woodcuts. The arrangement is somewhat different from that afterwards put forward by the author (see next reference), the *Ungulata* and *Sirenia* being separated by the *Chiroptera*, *Insectivora*, and *Rodentia*, the special articles on which were written by G. E. Dobson.

[Flower, W. H.] On the arrangement of the Orders and Families of existing *Mammalia*. P. Z. S. 1883, p. 178.

The following is the arrangement adopted :—

Sub-class Prototheria or *Ornithodelphia*.
Order *Monotremata*. Two families.
Sub-class Metatheria or *Didelphia*.
Order *Marsupialia*. Six families.
Sub-class Eutheria or *Monodelphia*.
Order *Edentata*.
Sub-order *Pilosa*. Two families.
„ *Loricata*. One family.
„ *Squamata*. One family.
„ *Tubulidentata*. One family.
Order *Sirenia*. Two families.
Order *Cetacea*.
Sub-order *Mystacoceti*. One family.
„ *Odontoceti*. Three families.
Order *Ungulata*.
Sub-order *Artiodactyla*.
Suina. Four families.
Tragulina. One family.
Tylopoda. One family.
Pecora. Four families.
Sub-order *Perissodactyla*. Three families.
„ *Hyracoidea*. One family.
„ *Proboscidea*. One family.
Order *Rodentia*.
Sub-order *Simplicidentata*. Fifteen families.
„ *Duplicidentata*. Two families.
Order *Chiroptera*.
Sub-order *Megachiroptera*. One family.
„ *Microchiroptera*. Five families.
Order *Insectivora*.
Sub-order *Dermoptera*. One family.
„ *Insectivora vera*. Nine families.
Order *Carnivora*.
Sub-order *Pinnipedia*. Three families.
„ *Carnivora vera* or *Fissipedia*.
Arctoidea. Four families.
Cynoidea. One family.
Eluroidea. Four families.

Order *Primates*.
Sub-order *Lemuroidea*. Three families.
" *Anthropoidea*. Five families.

This arrangement, inverted, is, in its main outlines, similar to that used last year in the Zool. Rec., and in the present volume it is followed throughout, with the slight exception that the *Sirenia* are placed next to the *Ungulata*, as they seem better to deserve this position than the *Cetacea*. It is to be hoped that other writers will also follow an arrangement by which the *Chiroptera* and *Insectivora* are lowered from their unnatural but time-honoured position near the Lemurs, and which, as a whole, represents the results of all the most recent researches on the subject.

[Flower, W. H.] [See also *Felidæ*, *Mustelidæ*, *Elephantidæ*, *Equidæ*, *Sirenia*, *Cetacea*, *Balænidæ*, *Delphinidæ*, *Megatheriidæ*.]

Forsyth-Major, C. J. [See *Suidæ*.]

Franck, L. Kleine vergleichende Anatomie der Hausthiere. Stuttgart: 1883, 8vo, pp. 400.

[Not seen by Recorder; *cf.* Science, ii. p. 668.]

Fraser, A. On the Inversion of the Blastodermic Layers in the Rat and Mouse. P. R. Soc. xxxiv. pp. 430-437; see also J. R. Micr. Soc. (2) iii. p. 345.

Friedel, E. Der Bronzepfahlbau in Spandau bei Berlin. Arch. f. Anthrop. xiv. p. 373.

Contains (p. 382) a list of the Mammal remains found.

Garson, J. G. [See *Porcula salvania* (*Suidæ*).]

Geinitz, H. B. Ueber einige Kiesablagerungen und die diluvialen Säugethiere des Königreichs Sachsen. SB. Ges. Isis, 1883, p. 93.

Gives notes on the remains, in the Dresden Museum, of 13 species of Mammals.

Gervais, H., & Ameghino, F. Les mammifères fossiles de l'Amérique du Sud. Buenos Aires & Paris: 1880.

This work having been hitherto unattainable to the Zoological Recorders, it is thought better that it should be included in the present volume, although some years after date, rather than that it should be altogether omitted. It consists of a preliminary list, with diagnoses of the new forms, of some 300 fossil S. American Mammals, of which about 60 are described as new. [See *Lemuridæ*, *Canidæ*, *Mustelidæ*, *Otariidæ*, *Muridæ*, *Caviidæ*, *Chinchillidæ*, *Mesotheriidæ*, *Toxodontidæ*, *Equidæ*, *Camelidæ*, *Bovidæ*, *Cervidæ*, *Megatheriidæ*, *Glyptodontidæ*, and *Didelphyidæ*.] (*Cf.* also W. Branco, JB. Mineral. 1883, i. p. 300.)

Gervais, H. P. [See *Megaptera indica*, sp. n. (*Balænidæ*); *Pontoporia blainvillii* (*Platanistidæ*).]

Giebel, C. G. Dr. H. G. Bronn's Klassen und Ordnungen des Thierreichs. vi. Abth. v. *Mammalia*. No. 26. Leipzig & Heidelberg, pp. 545–576, pls. lxxxviii. & lxxxix.

In the present part the description of the bones of the manus is

finished, and that of the pelvis commenced. [*Cf.* Zool. Rec. xvi. *Mamm.* p. 4.]

GILDER, W. H. Ice-pack and Tundra; an Account of the Search for the 'Jeannette,' and a Sledge Journey through Siberia. London: 1883, 8vo.

Contains incidental notes on Mammals.

GILL, T. [See *Insectivora.*]

GIRARD, M. Histoire naturelle; 2me année. Tome i. Notions générales; anatomie et physiologie; Mammifères; Oiseaux. Paris: 1883, 16mo, pp. 708.

[Not seen by Recorder; *cf.* Science, ii. p. 668].

GOEHLERT, V. [See *Equidæ.*]

GOTTSCHAU, M. Structur und embryonale Entwickelung der Nebennieren bei Säugethieren. Arch. Anat. Phys. (Anat.) 1883, pp. 412–458, pls. xviii. & xix., and Biol. Centralbl. iii. p. 565. [See also Zool. Rec. xix. *Mamm.* p. 7.]

GRASHEY, O. [See *Canidæ.*]

GRIMM, O. Fishing and Hunting on Russian Waters. 1883: 8vo. Part x. Hunting and Trapping in the Waters of Russia.

Gives an account of the extent to which various animals, such as sea-otters, seals, whales, &c., are hunted in Russia for commercial purposes.

GRUENHAGEN, A. Die Nerven der Ciliarfortsätze des Kaninchens. Arch. mikr. Anat. xxii. p. 369, pl. xiv.

GRUNERT, J. T. [See *Phocidæ.*]

GULDBERG, G. A. [See *Delphinidæ.*]

GÜNTHER, A. [See *Perameles myoides*, sp. n. (*Peramelidæ*).]

GUZMAN, D. J. Apuntiamentos sobre la Topografia Fisica de la Republica del Salvador. San Salvador: 1883, 8vo.

Contains an account of the Mammals of San Salvador, pp. 297–322.

HAAST, J. VON. [See *Balænidæ*, *Physeteridæ.*]

HARTING, J. E. [See *Cervidæ.*]

HARTMANN, R. [See *Simiidæ.*]

HARZ, W. Beiträge zur Histiologie des Ovariums der Säugethiere. Arch. mikr. Anat. xxii. pp. 374–406, pl. xv.; abstract in J. R. Micr. Soc. (2) iii. p. 490.

HASWELL, W. A. [See *Kogia greyi* (*Physeteridæ*).]

HAYDEN, F. V., & SELWYN, A. R. C. North America; Stanford's Compendium of Geography and Travel. London: 1883, 8vo.

Contains numerous references to the Mammals of Canada and the United States, especially to those which have an economic value.

HAYEM, G. Sur les plaquettes du sang, de M. Bizzozero, et sur le troisième corpuscule du sang, ou corpuscule invisible, de M. Norris. C. R. xcvii. p. 458.

A short notice on the common discovery of the third blood-corpuscule by the two authors named.

HEAPE, W. [See *Talpidæ*.]

HEIBERG, J. Ueber die Lehre vom Drucke der Bandscheiben des Kniegelenkes auf das untere Femurende. Arch. Anat. Phys. (Anat.) 1883, p. 171, pl. vi.

HEILPRIN, A. On the Value of the Nearctic as one of the Primary Zoological Regions. Replies to Criticisms by Mr. A. R. Wallace & Prof. Gill. P. Ac. Philad. 1883, p. 266.

The author, in replying to the critiques on his paper noted last year [Zool. Rec. xix. *Mamm.* p. 8], still maintains that the Nearctic and Palæarctic regions should be amalgamated into a single region, which he proposes to call "Holarctic."

HENSEN, V. Ein frühes Stadium des im Uterus des Meerschweinchens festgewachsenen Eies (Ableitung der Umkehrung die Keimblätter). Arch. Anat. Phys. (Anat.) 1883, p. 61, pl. iii.

——. Bemerkungen betreffend die Mittheilungen von Selenka und Kupffer über die Entwickelung der Mäuse. Arch. Anat. Phys. (Anat.) 1883, p. 71. [See also C. S. Minot, Science, i. p. 407.]

HIGGINS, E. T. [See *Muridæ* and *Dasyuridæ*.]

HOCHSTETTER, F. VON. Die Lettenmaierhöhle bei Kremsmünster. SB. Ak. Wien, lxxxv. p. 84.

Numerous fossil Mammal remains are noted.

——. Bericht über die Resultate der im Auftrage der prähistorischen Commission im Jahre 1881 in der mährischen Höhlen vorgenommenen Untersuchungen. Anz. Ak. Wien, xix. p. 39.

Notes on the fragments of a few fossil Mammals.

HOGGAN, G. & F. E. Étude sur les terminaisons nerveuses dans la peau. J. de l'Anat. Phys. xix. pp. 377–398, pls. xvi. & xvii.

HOLDER, E. B. [See *Balænidæ*.]

HORN, W. The *Mammalia* of North-West Perthshire. P. N. H. Soc. Glasg. v. p. 119.

26 recent and 4 extinct species are referred to.

——. On the *Mammalia* of Buchan, North-East Aberdeenshire. P. N. H. Soc. Glasg. v. p. 228.

34 species are recorded, with notes on their rarity and habits.

HOWORTH, H. H. The Fauna and Flora of the European Loess, being a reply to Prof. Dr. Nehring. Geol. Mag. (2) x. pp. 206 & 381.

HUET, J. [See *Otariidæ*.]

HUGHES, T. McK. On Fossils from the Pleistocene Gravels of Barnwell, near Cambridge. Geol. Mag. (2) x. p. 454.

Shows that some at least of the bones obtained from these beds are of far later date than that of the main mass of the deposit.

IMTHURN, E. F. Among the Indians of Guiana; being sketches, chiefly anthropological, from the interior of British Guiana. London: 1883, 8vo.

Contains (pp. 106–115) a general account of the Mammals of Guiana.

JANOŠIK, J. Bemerkungen über die Entwicklung der Nebenniere. Arch. mikr. Anat. xxii. pp. 738-746, pl. xxvii.A.

JENTINK, F. A. A List of Species of Mammals from West Sumatra and North Celebes, with descriptions of undescribed or rare species. Notes Leyd. Mus. v. p. 170.

The Mammals enumerated were collected by Mr. F. von Faber in the neighbourhood of Loeboe Basong, Priaman, W. Sumatra, and of Amoerang, N.-W. Celebes. 26 species are recorded from the former, and 23, one of which is new [see *Muridæ*] from the latter place. It is unfortunate that the author has mixed up, by arranging systematically, all the 49 species obtained, as the interest which always attaches to any list of Celebes Mammals is thereby obscured. [See *Pteropus wallacii* (*Pteropodidæ*), *Mus faberi*, sp. n., *Echinothrix lencura* (*Muridæ*), *Cynonycteris brachyotis*, *Paradoxurus musschenbroeki* (*Viverridæ*).]

——. Mammals of the Dutch East Indies, in "Catalogue de la Section des Colonies Neerlandaises" of the Amsterdam Exhibition; Groupe i. pp. 132–138.

Consists of lists of the Mammals from various parts of the Dutch East Indies exhibited at the Amsterdam Exhibition.

——. [See also *Sciuridæ*.]

KENNEL, J. Biologische und faunistische Notizen aus Trinidad. Arb. Inst. Würzb. vi. p. 259.

A few Mammals are noted, and it is remarked that, owing to the absence of grass and underwood, and the exceeding steepness of the mountains, nearly all the species not amphibious in their habits live entirely in the trees, plant-eaters becoming frugivorous, and carnivora pursuing birds, reptiles, and insects.

KING, F. G. Instinct and Memory exhibited by the Flying Squirrel in Confinement, with a thought on the origin of Wings in Bats. Am. Nat. xvii. p. 36.

KITT, T. [See *Tapiridæ*.]

KLAATSCH, H. Zur Morphologie der Säugethier-zitzen. Morph. JB. ix. pp. 253–324, pls. xiii.–xvii.

Describes the structure and development of the mammæ in the various orders of Mammals, and gives (pl. xvii.) a diagrammatic representation of the different types of mamma-structure found throughout the class.

KOERNER, O. Beiträge zur vergleichenden Anatomie und Physiologie des Kehlkopfes der Säugethiere und des Menschen. Abh. senck. Ges. xiii. pp. 147–164 & 261–276.

Contains figures and descriptions of the larynx in various Mammals.

KÖLLIKER, A. Ueber die Chordahöhle und die Bildung der Chorda beim Kaninchen. SB. Ges. Würzb. 1883, p. 2.

KOLOMBATOVIC, G. Mammiferi, rettili ed anfibi della Dalmazia, e pesci rari e nuovi ecc. Spalato. Spalato: 1882, 8vo, pp. 35.

57 Mammals are recorded as natives of Dalmatia, and notes on their habits and Sclav names are appended. [Not seen by Recorder; *cf.* H. Baumgartner, Zool. Gart. xxiv. p. 94.]

KOPPEN, F. T. [See *Bovidæ*, *Cervidæ*.]

LANDOIS, H. Westfalens Thierleben in Wort und Bild. Paderborn: 1883.

Published by the Zoologische Section für Westfalen und Lippe, under the presidency of H. Landois. [Not seen by Recorder; *cf.* Zool. Gart. xxiv. p. 96.]

——. Ueber farbige Aberration westfälischer Säugethiere und einige Monstra aus Westfalen. Verh. Ver. Rheinl. xl. (CB.) p. 74.

Notes on albinism, melanism, and other varieties in the colour of Mammals.

——. [See also *Canidæ*.]

LANKESTER, E. R. [See *Ornithorrhynchidæ*.]

LATASTE, F. [See *Rodentia*, *Muridæ*, *Dipodidæ*.]

LAUZANNE, H. DE. Catalogue des Animaux Vertébrés de l'Arrondissement de Morlaix et du Nord Finistère. Bull. Soc. Finistère, v. 1883.

[Not seen by Recorder; *cf.* Zool. Anz. vii. p. 77.]

LAVOCAT, —. The Homologues of the Parts of the Temporal Bones. Mém. Ac. Toulouse, iv. p. 71.

The author describes the temporal bone in the different classes of vertebrates, and gives a synonymy of its parts in the lower forms. [Not seen by Recorder; *cf.* Science, ii. p. 113.]

——. Construction de la ceinture scapulo-claviculaire dans la série des Vertébrés. C. R. xcvii. p. 1316.

The author thinks that in the Monotremes, Birds, and Reptiles, the names 'clavicle' and 'coracoid' have become transposed, and that these represent respectively the coracoid and clavicle of the higher Mammals, Amphibians, and Fish.

——. Appareil hyoïdien des Animaux Vertébrés. C. R. xcvi. p. 723.

The author insists on the remarkable agreement in character that there is in the hyoid apparatus of the different Vertebrates.

LEMOINE, —. [See *Plagiaulacidæ*.]

LEYDIG, F. Untersuchungen zur Anatomie und Histologie der Thiere. Abschnitt 2: Zelle und Gewebe. Bonn: 1883, 8vo.

Concerns the lower forms for the most part, but has incidental references to *Mammalia*.

LUBACH, D. De huisdieren bij de Ouden. Album Nat. 1882, pp. 328 & 368.

On the domestic Mammals of the ancient Jews.

LUCAE, J. C. G. Die Statik und Mechanik der Quadrupeden, an dem Skelet und den Muskeln eines *Lemur* und eines *Cholœpus*. Abh. senck. Ges. xiii. pp. 1–92, pls. i.–xxiv. 1883.

Contains descriptions and excellent figures of the myology and osteology of *Lemur macaco* and *Cholopus didactylus*. Quoted incorrectly last year from Zool. Anz., but not seen by Recorder [see Zool. Rec. xix. *Mamm.* p. 11].

——. Zur sutura transversa squamæ occipitis bei Thieren und Menschen. Abh. senck. Ges. xiii. pp. 247–260, pls. i.–iv.

LUCHSINGER, B. [See *Artiodactyla*.]

LYDEKKER, R. Note on the Probable Occurrence of Siwalik Strata in China and Japan. Rec. Geol. Surv. Ind. xvi. p. 158.

The author refutes the opinion of D. Braun's (see above) as to the age of certain Japanese fossiliferous beds, and shows that they are the equivalent of the Indian Siwalik strata.

——. Synopsis of the Fossil Vertebrata of India. Rec. Geol. Surv. Ind. xvi. p. 61.

A most useful and important paper, containing a concise account of all the fossil Mammals of India, notably those from the rich Pliocene deposits of the Siwalik hills. A 'systematic chronological' and an alphabetical list of the species, the latter with the more important synonyms, are appended.

——. [See also *Artiodactyla*, *Giraffidæ*.]

MACKENNA, B. V. Juan Fernandez, historia verdadera de la isla de Robinson Crusoe. Santiago: 1883, 8vo.

Contains short notes (chap. xviii.) on the whale fishery of Juan Fernandez.

MACLAY, N. DE MIKLUKHO-. [See *Echidnidæ*.]

MACOUN, J. Manitoba and the Great North-west. London: 1883, 8vo.

Chapter xx., pp. 324–353, contains a list, with notes on habits, &c., of 75 species of North American Mammals.

MAGITOT, E. Des lois de la dentition. J. de l'Anat. Phys. xix. p. 59.

An attempt to formulate the laws by which the formation, time of eruption, number, morphology, size, position, and function of vertebrate teeth are governed.

MALM, A. W. [See *Cetacea*, *Berardius vegæ*, sp. n. (*Physeteridæ*).]

MANOUVRIER, L. Note sur les relations mutuelles de plusieurs animaux d'espèces differentes réunis par domestication. Bull. Soc. Zool. 1883, p. 161.

MARCY, H. O. The Placental Development in Mammals: a unity of anatomical and physiological modality in all vertebrates. P. Am. Ass. xxxi. p. 483.

Gives a general account of the development of the placenta, and of the nourishment of the fœtus by the mother.

MAZZA, F. Note faunistiche sulla Valle di Staffora (Pavia): Vertebrati. Atti Soc. Ital. xxiv. [1881] p. 62.

20 species of Mammals are recorded.

MÉGNIN, P. [See *Canidæ*.]

MEUNIER, S. Sur un gisement de Mammifères quaternaires aux environs d'Argenteuil (Seine-et-Oise). C. R. xcvi. p. 1510, and Bull. Soc. Géol. xi. p. 462. [See also Le Nat. ii. p. 338.]

Remains were found of *Elephas*, *Rhinoceros* (*tichorrhinus*), *Hyæna* (*spelæa*), *Bison* (*priscus*), *Equus*, and *Rangifer*.

MEYER, A. B. [See *Cervidæ*.]

MINOT, C. S. The Origin of the Mesoderm. Science, ii. p. 815.

A review of the work on this subject done by His, O. Hertwig, and others.

MOJSISOVICS, A. VON. Zur Fauna von Béllye und Dárda (Hungary). 1. Säugethiere. MT. Ver Steierm. 1883, pp. 122–161.

45 species of Mammals are recorded, with notes on their distribution and habits.

——. [See also *Elephas africanus* (*Elephantidæ*).]

MOLINA, A. De hominis mammaliumque cute. Atti Soc. Tosc. v. pp. 255–286.

On the minute anatomy of the skin.

MORENO, F. P. Patagonia, resto de un antiguo continente hoy sumerjido. An. Soc. Arg. xiv. pp. 97–131.

Contains an important general account of the fossil Mammals of Patagonia. Numerous new genera and species are referred to by name, but are not described. [See Trouessart, Rev. Sci. xxxii. p. 590.]

MORTILLET, G. DE. Note sur l'albinisme des Mammifères. Atti Soc. Ital. xxiv. p. 87.

MÜLLER, P. Das Porenfeld (Area cribrosa) oder Cribrum benedictum, aut., der Nieren des Menschen und einiger Haus-säugethiere. Arch. Anat. Phys. (Anat.) 1883, pp. 341–372, pls. xv. & xvi.

MUNK, H. Über die centralen Organe für das Sehen und das Hören bei den Wirbelthieren (pt. i.). SB. Ak. Berl. 1883, pp. 793–827.

Gives accounts of experiments on dogs, monkeys, and (chiefly) pigeons.

MUSSCHENBROEK, S. C. J. W. VAN. [See BERNSTEIN, H. A.]

MUYBRIDGE, E. The Attitudes of Animals in Motion, illustrated with the Zoopraxiscope. P. R. Inst. x. p. 44.

NEHRING, A. Ueber neue bei Westeregeln gemachte Fossilfunde, sowie über die Vorgeschichte des Pferdes in Europa. SB. nat. Fr. 1883, p. 50.

A few Mammals are noted as found fossil at Westeregeln, a village between Magdeburg and Halberstadt, the main part of the paper being devoted to the horse. [See *Equus caballus* (*Equidæ*).]

——. The Fauna of Central Europe during the period of the Loess. Geol. Mag. (2) x. p. 51.

Contends, in answer to H. H. Howorth, that the Loess has purely a steppe-fauna, and founds his conclusions on the numerous steppe animals whose remains are found in it.

——. [See also *Halichœrus gryphus* (*Phocidæ*), *Equidæ*, *Bovidæ*, *Cervidæ*.]

NEUMAYR, M. Die diluvialen Säugethiere der Insel Lesina. Verh. geol. Reichsanst. 1882, p. 161.

An unimportant note on the large Mammals found fossil in the little Dalmatian island of Lesina.

NEWTON, E. T. [See *Coryphodontidæ*.]

NICHOLS, A. Zoological Notes on the Structure, Affinities, Habits, and Mental Faculties of Wild and Domestic Animals; with anecdotes concerning and adventures among them; and some account of their fossil representatives. London: 1883, 8vo.

Contains (pp. 61–134) popular notes on the habits and affinities of various Marsupials and Monotremes.

NITSCHE, H. [See *Cervidæ*.]

NORDQUIST, O. Anteckningar och studier till Sibiriska Ishafskustens Däggdjursfauna; in A. E. Nordenskiöld's Vega-Expeditionens Vetenskapliga Iakttagelser. Stockholm: 1883, 8vo, pp. 61–117.

Contains important notes on the Mammals of the North Siberian seas and coasts. [See *Trichechus rosmarus* (*Trichechidæ*), *Histriophoca fasciata* (*Phocidæ*), and *Lepus variabilis* (*Leporidæ*).]

NORRIS, R. On the Development and Coagulation of the Blood. P. Birm. Phil. Soc. iii. pp. 472–514.

Further remarks on the third morphological element in the blood of Mammals, said to have been discovered by Bizzozero in 1882 [*cf.* Zool. Rec. xix. *Mamm.* p. 2], but described by the author in 1878.

NORTON, F. [See *Chiroptera*.]

OBERSTEINER, H. Der feinere Bau der Kleinhirnrinde bei Menschen und Thieren. Biol. Centralbl. iii. pp. 145–155.

OLIVIER, E. Faune des Doubs, ou Catalogue Raisonnée des animaux sauvages observés jusqu'à ce jour dans ce departement. Mém. Soc. Doubs, 1883, pp. 31.

43 species of Mammals have been observed in the department. [A separate copy only seen.]

Olsson, P. Nya bidrag till kännedomen om Jemtlands fauna. Œfv. Ak. Förh. 1882, No. 10, p. 35.

17 species are recorded as occurring in Jemtland.

Osborn, H. F. [See *Rhinocerotidæ*, *Artiodactyla*, *Marsupialia*.]

Owen, [Sir] R. [See *Thylacoleo carnifex* (*Plagiaulacidæ*), *Echidna ramsayi*, sp. n. (*Echidnidæ*).]

Paladino, J. Sur l'endothélium vibratile chez les Mammifères, et sur quelques faits physiologiques relatifs aux formations endothéliales. Arch. Ital. Biol. iii. pp. 43–56.

Payne-Gallwey, [Sir] 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: 8vo, pp. 503.

Although apparently, from its title, purely ornithological, this work contains a chapter (pp. 313–330) on the distribution of the rarer Mammals of Ireland.

Pelzeln, A. von. Brasilische Säugethiere. Resultate von Johann Natterer's Reisen in der Jahren 1817 bis 1835. Theil i. *Primates*, *Chiroptera*, & *Carnivora*; Theil ii. *Rodentia*, *Ungulata*, *Sirenia*, *Edentata*, & *Marsupialia*. Verh. z.-b. Wien, xxxiii. Anhang.

The plan of this paper is an extremely useful one, namely, to give exact particulars of all the specimens collected by Natterer in Brazil, the localities, dates, habits, colours of the soft parts, &c., &c., and Dr. von Pelzeln deserves the thanks of workers on Neotropical Mammals for the information he has furnished. He has, however, adopted the reprehensible system of publishing all the collector's manuscript names for the species, one unfortunate bat becoming thereby possessed of no less than nine additional synonyms; while in another case a new species of bat is described merely by the publication of Natterer's name and notes. Moreover, the names heading the synonymy are constantly quite different from those generally recognized, without any explanation of the change being given, all of which much reduces the value of the paper, and implies a serious addition to the already enormous amount of Mammal synonymy-work to be done in the future. In all, Natterer sent to Vienna, in the course of his ten expeditions, no less than 1179 specimens belonging to 205 species, a record probably unequalled by any collector. [See *Phyllostoma chrysosema* (*Phyllostomatidæ*), *Hesperomys rattus* (*Muridæ*), spp. nn., *Manatus inunguis* (*Manatidæ*), and *Xenurus loricatus* (*Dasypodidæ*), sp. n.]

Pestalozzi, T. Das Thierleben der Landschaft Davos. Davos: 1883, 8vo, pp. 56.

[Not seen by Recorder; *cf.* Zool. Anz. vi. p. 602.]

Peters, W. [See *Pteropodidæ*.]

Petterd, W. F. [See *Muridæ* and *Dasyuridæ*.]

Pfeiffer, L. Ueber Secret-Vacuolen der Leberzellen im Zusammenhange mit den Gallenkapillaren. Arch. mikr. Anat. xxiii. pp. 22–30 pl. ii.

PIANA, G. P. [See *Bovidæ*.]

PIETREMONT, C. A. [See *Equidæ*.]

POLIAKOFF, —. [See *Muridæ*.]

PRJÉVALSKY, N. [Third Journey to Thibet.] St. Petersburg: 1883, 4to.

Contains a chapter on the Mammals observed. Three are new. [See *Canis ekloni* (*Canidæ*), *Ursus lagomyiarius* (*Ursidæ*), and *Pocphagus mutus* (*Bovidæ*), spp. nn.]

POULTON, E. B. On Heredity in Cats with an Abnormal Number of Toes. Nature, xxix. p. 20; abstract in Rep. Brit. Ass. 1883, p. 543.

The author gives statistics as to the transmission of abnormal numbers of toes from generation to generation.

——. The Tongue of *Perameles nasuta*, with some suggestions as to the origin of Taste Bulbs. Q. J. Micr. Sci. xxiii. pp. 69–86, pl. i.

——. [See also *Marsupialia*.]

RAMSAY, E. P. [See *Hapalotis papuanus* (*Muridæ*), *Dendrolagus dorianus* (*Macropodidæ*), spp. nn.]

RANVIER, L. De l'existence et de la distribution de l'éléidine dans la muquese bucco-œsophagienne des Mammifères. C. R. xcvii. p. 1377.

REGNARD, P., & BLANCHARD, R. Étude sur la capacité respiratoire du sang des animaux plongeurs, sa comparaison avec la capacité respiratoire du sang des autres animaux. Bull. Soc. Zool. 1883, p. 136.

The authors find that in diving Mammals, such as the seals, there is a much greater proportion of hæmoglobin in the blood, by which they are enabled to store up a greater supply of oxygen.

REICHENOW, A. *Mammalia* in Arch. f. Nat. for 1882, xlix. part v. pp. 385–426. Berlin: 1883.

REIN, G. Beiträge zur Kenntniss der Reifungserscheinungen und Befruchtungsvorgänge am Säugethiere. Arch. mikr. Anat. xxii. pp. 233–270, pl. ix.

The author describes the processes of growth and maturation of the ova in rabbits and guinea-pigs. [See also C. S. Minot, Science, ii. p. 835.]

RENANT, J. [See *Rodentia*.]

RENSON, G. Recherches sur le rein céphalique et le corps de Wolff chez les Oiseaux et les Mammifères. Arch. mikr. Anat. xxii. pp. 599–608.

——. Contributions à l'Embryologie des organes d'excretion des oiseaux et des Mammifères. Bruxelles: 1883.

[Not seen by Recorder; *cf.* the bibliography in A. R. Spoof's "Cloake und Urogenitalorgane."] (See *infrà*.)

REPIACHOFF, W. Ein paar Worte über die morphologische Bedeutung der jüngsten Säugethierkeime. Zool. Anz. vi. p. 64.

The author supports Metschnikoff's theory that the impregnated ovum of Mammals represents a separate sexless individual. [*Cf.* C. S. Minot, Science, i. p. 289.]

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[Repiachoff, W. J. Bemerkungen über die Keimblätter der Wirbelthiere. Zool. Anz. vi. p. 116.

Compares the germinal layers of *Amphioxus* with those of Mammals, and doubts the absolute homology of the various germinal layers in different groups of animals. [This view is opposed by C. S. Minot, Science, i. p. 525.]

——. Zur Morphologie des Primitivstreifens. Zool. Anz. vi. p. 365. [See also C. S. Minot, Science, ii. p. 772.]

Retterer, —. Sur la génération des cellules de renouvellement de l'épiderme et des produits épithéliaux. C. R. xcvi. p. 513.

An account of the microscopic anatomy of the skin, based upon sections of the sole of the dog.

Richiardi, S. [See *Bovidæ*.]

Riggio, G. [See *Delphinidæ*.]

Rochebrune, A. T. de. Faune de la Sénégambie : Mammifères. Act. Soc. L. Bord. (4) vii. pp. 49–203, pls. iv.–xii. Also published separately; Paris : 1883, 8vo.

This work, it is to be feared, will not be of much real use to students of the West African fauna. Its author's chief object seems to have been to accumulate as large a number of genera and species as possible, and he may be congratulated on his success in this direction, as he mentions no less than 66 families, 126 genera, and 219 species, a result attained by the recognition, for the most trivial reasons, of all the good or bad genera and species described from the district, and also by the foundation of others on the different races of domesticated species, and on slight varieties of wild ones [see Zool. Rec. xix. *Mamm.* p. 13]. Notes on the native names and comparative rarity of the species are appended; and, in the cases where no doubt can exist as to their correct identification, these may be of some service. Besides those mentioned last year, 2 new species are indicated. [See *Felis bouvieri* (*Felidæ*), "*Cuniculus*" *senegalensis* (*Leporidæ*).]

Roemer, F. Die Knochenhöhlen von Ojcow in Polen. Palæontogr. xxix. pp. 193–233, pls. xxii.–xxxiii.

Remains of 48 species of Mammals were found, many of which are described and figured.

Rogner, V. Ueber das Variiren der Grosshirnfurchen bei Lepus, Ovis, und Sus. Z. wiss. Zool. xxxix. pp. 596–614, pl. xxxv.

Describes the variations found in the fissures on the upper part of the cerebral hemispheres in the three genera mentioned.

Rosenberg, E. [See *Edentata*.]

Roth, S. Ueber Ausgrabungen in den Höhlen der Hohen Tatra. JB. Karpath. Ver. ix. p. 333.

[Not seen by Recorder ; *cf.* Arch. f. Nat. xlix. p. 392.]

ROUX, W. Beiträge zur Morphologie der functionellen Anpassung; i. Structur eines hoch differenzirten bindegewebigen Organes (der Schwanzflosse des Delphin). Arch. Anat. Phys. (Anat.) 1883, pp. 76–162, pl. iv.

RUTIMEYER, L. [See *Cervidæ*.]

SAUSSURE, H. DE. [See *Cervidæ*.]

SCHIRMACHER, E. Die diluvialen Wirbelthierreste der Provinz Ost- und Westpreussen. Königsberg: 1882 (Inaug. diss.).

[Not seen by Recorder; *cf.* Arch. f. Nat. xlix. p. 392.]

SCHLACHTER, L. [See *Cervidæ*.]

SCHLOSSER, M. [See *Chalicotheriidæ*, *Anoplotheriidæ*.]

SCHMARDA, L. K. Bericht über die Fortschritte unserer Kenntnisse von der geographischen Verbreitung der Thiere. Geogr. JB. ix. pp. 206–278.

A general account of the recent additions to geographical zoology.

SCHNEIDEMÜHL, G. Lage der Eingeweide bei der Haus-säugethieren nebst Anleitung zu Exenteration für anatomische und patholog.-anatomische Zwecke. Hanover: 1883. 8vo, pp. 173.

[Not seen by Recorder; *cf.* Science, ii. p. 668.]

SCHWALBE, —. Ueber die Nasenmuscheln der Säugethiere und des Menschen. SB. Ges. Königsb. xxiii. p. 3.

Notes on the internal nasal muscles of man and other Mammals.

SCLATER, P. L. [See *Bovidæ*.]

SCOTT, W. B. [See *Rhinocerotidæ*, *Lophiodontidæ*.]

SEELEY, H. G. The History of the Skull. Am. Nat. xvii. p. 392.

SELENKA, E. Studien über Entwickelungsgeschichte der Thiere. Heft i. Keimblatter und Primitivorgane der Maus. Wiesbaden: 1883, 4to.

[Not seen by Recorder; *cf.* Science, ii. p. 454.]

SELWYN, A. R. C. [See HAYDEN, F. V.]

SIMANOWSKY, N. Beiträge zur Anatomie des Kehlkopfs. Arch. mikr. Anat. xxii. pp. 690–709, pl. xxvi. [See also W. Waldeyer, Nachr. Ges. Gött. 1883, p. 188.]

SLEE, H. C. [See *Artiodactyla*.]

SOUTHWELL, T. [See *Otariidæ*, *Balænidæ*, *Physeteridæ*.]

SPEE, [GRAF] F. Beitrag zur Entwickelungsgeschichte der früheren Stadien des Meerschweinchens bis zur Vollendung der Keimblase. Arch. Anat. Phys. (Anat.) 1883, pp. 44–60, pl. ii.; abstract in J. R. Micr. Soc. (2) iii. p. 487. [See also Science, i. p. 406.]

SPOOF, A. R. Beiträge zur Embryologie und vergleichenden Anatomie der Cloake und der Urogenitalorgane bei den höheren Wirbelthieren. (Inaug. diss.) Helsingfors: 1883, 8vo, pp. 116, pls. 5.

An important paper on the structure and development of the

urinogenital organs and the surrounding parts of Mammals and Birds, chiefly the former, and containing a copious account of the previous literature on the subject. The organs of several rare Mammals, such as *Bradypus tridactylus*, *Phascolarctus cinereus*, *Dasyurus maugei*, &c., are figured and described.

STEARNS, W. A. Notes on the Natural History of Labrador: Mammals. P. U. S. Nat. Mus. vi. p. 112.

41 species of Mammals are recorded, with short notes on their rarity and distribution.

STEGLICH, B. [See *Equidæ*.]

STEJNEGER, L. Notes on the Natural History of the Commander Islands, including descriptions of new Cetaceans. P. U. S. Nat. Mus. vi. p. 58.

The only indigenous land Mammal is the Arctic Fox. *Mus musculus*, *Arvicola rutilus*, and *Rangifer tarandus*, have also been introduced recently from Kamtschatka. The Sea-Mammals are referred to below. [See *Balænoptera velifera* (*Balænidæ*), *Berardius* (?) *bairdi*, sp. n., *Ziphius grebnitzkii*, sp. n. (*Physeteridæ*), *Rhytina gigas* (*Rhytinidæ*), *Enhydra lutris* (*Mustelidæ*).]

STIRLING, W. The Trachealis Muscle of Man and Animals. J. Anat. Phys. xvii. p. 204.

Describes the variations met with in this muscle in man, the cat, dog, rabbit, rat, pig, ox, and sheep.

STOHR, P. Ueber die peripheren Lymphdrüsen. SB. Ges. Würzb. 1883, pp. 86–96.

STROBEL, P. [See *Suidæ*.]

STRUCK, C. Verzeichniss der warmblütigen Wirbelthiere die sich im von Maltzan'schen naturhistorischen Museum für Mecklenburg befinden. 1. Säugethiere. Arch. Ver. Mecklenb. xxxvi. p. 23.

A mere list.

STRUCKMANN, C. Die Einhornhöhle bei Scharzfeld am Harz, ein Beitrag zur Urgeschichte des nordwestlichen Deutschlands. Arch. f. Anthrop. xiv. p. 191.

Contains notes on the Mammals found fossil in this cave.

STUDER, T. Die Thierwelt in den Pfahlbauten des Bielersee's. MT. Ges. Bern. 1882 [pub. 1883], Heft 2, p. 17, pls. i.–v.

Contains notes on the remains of 19 Mammals found in the Bieler Lake-dwellings. Many skulls are figured.

SUMICHRAST, F. Enumeracion de las especies de Mamiferos . . . . observados en la parte central y meridional de la República Mexicana. Nat. Mex. v. pp. 199 & 322.

[Not seen by Recorder; *cf.* Zool. Anz. vii. p. 138.]

SUTTON, J. B. [See *Primates*.]

SWAN, J. G. [See *Otariidæ*.]

Szombathy, J. Ueber Ausgrabungen in den mährischen Höhlen in Jahre 1881. SB. Ak. Wien, lxxxv. p. 90.

Tafani, A. Les épithéliums acoustiques. Arch. Ital. Biol. iii. pp. 62–74.

A preliminary notice to a larger memoir yet to appear.

Taschenberg, O. Beiträge zur Fauna der Insel Sokotra, vorzuglich nach dem von Dr. E. Riebeck in Halle gesammelten Materiale zusammengestellt. Z. Ver. Sachs. Thür. (4) ii. p. 157.

3 Mammals are noted, viz., *Rhinopoma microphyllum*, *Mus albipes*, and *Mus gentilis*.

Tereg, G. [See *Equidæ*.]

Testut, L. [See *Primates*.]

Thomas, O. [See *Pœcilogale*, g. n. (*Mustelidæ*), and *Sciuridæ*.]

Toula, F. Einige neue Wirbelthierreste aus der Braunkohle von Göriach bei Turnau in Steiermark. Verh. geol. Reichsanst. 1882, p. 274.

Remains of *Rhinoceros*, *Dicroceros*, &c., are described.

——. Materialen zu einer Geologie der Balkanhalbinsel. JB. geol. Reichsanst. xxxiii. p. 61.

Forms a bibliography of all the published works on the geology, and incidentally on the palæontology and zoology, of the Balkan Peninsula.

Trouessart, E. L. La faune éocène de la Patagonie australe et le grand continent antarctique. Rev. Sci. xxxii. p. 588.

A French account of the paper by F. P. Moreno referred to above.

True, F. W. [See *Histriophoca fasciata* (*Phocidæ*), *Geomyidæ*, *Cervidæ*, *Physeteridæ*.]

Tullberg, T. [See *Balænidæ*.]

Turner, W. Cervical Ribs and the so-called Bicipital Ribs in Man, in relation to corresponding structures in the *Cetacea*. J. Anat. Phys. xvii. p. 384.

Both in man and the *Cetacea*, several cases of cervical and bicipital ribs are quoted, and it is shown that the latter may either be a fusion of the cervical and first dorsal or of the first and second dorsal ribs. In either case it is always purely an individual peculiarity.

Ugolini, U. La cassa ossea del cervello, studiata analiticamenti in alcuni crani di scimmia. Atti Soc. Pad. viii. pp. 147–275.

An analysis of the contents, internal angles, and other characters of the brain-cases of monkeys.

Uskow, N. Ueber die Entwickelung des Zwerchfells, des Pericardiums und des Cœloms. Arch. mikr. Anat. xxii. pp. 143–218, pls. i.–vi.

Worked out, for the Mammals, on rabbit, dog, pig, sheep, and rat embryos.

——. Bemerkungen zur Entwickelungsgeschichte der Leber und der Lungen. Arch. mikr. Anat. xxii. p. 219, pls. vii. & viii.; see also C. S. Minot, Science, ii. p. 89.

VAN BENEDEN, P. J. [See *Balænidæ*.]

VASILIN, C. Sur la moelle osseuse comme organe de formation des globules rouges du sang (Despre Maduva Osselor ca organ de formatiune a globulilor rosii ai sangelui). Bucharest: 1883.

[Not seen by Recorder; *cf.* J. de l'Anat. Phys. xix. p. 239.]

VIGNAL, W. Mémoire sur le développement des tubes nerveux chez les embryons de Mammifères. Trav. Lab. Histol. 1883, pp. 110–131, pls. v. & vi. (B).

——. Accroissement des tubes nerveux par la formation de segments intercalaires. *L. c.* pp. 133–145, pl. vi. (A).

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VITI, A. Ricerche di Morfologia comparata sopra il Nervo depressore nell' uomo e nigli altri Mammiferi. 1. Il nervo depressore del Coniglio. P.-v. Soc. Tosc. 1883, p. 282.

[Not seen by Recorder; *cf.* Zool. Anz. vii. p. 331.]

WATSON, M. [See *Elephas indicus* (*Elephantidæ*).]

WELIKY, W. Zum feineren Bau des Bindegewebes. Bull. Pétersb. xxviii. p. 292, and Mél. Biol. xi. pp. 481–483.

WENZ, —. [See *Artiodactyla*.]

WIEDEMANN, A. Die in Regierungsbezirke Schwaben und Neuberg vorkommenden Säugethiere. Ber. Ver. Augsburg, xxvii. pp. 1–112.

Contains a full account of 70 living and many fossil or extinct Mammals of Swabia.

WIEDERSHEIM, R. Lehrbuch der vergleichenden Anatomie der Wirbelthiere, auf Grundlage der Entwicklungsgeschichte. Jena: 1883, 8vo, pp. 905.

One of the most important text-books on the anatomy and embryology of vertebrates that has appeared for some years. A copious bibliography of the subject is appended.

WINDLE, B. C. A. On the Embryology of the Mammalian Muscular System. No. I. The Short Muscles of the Human Hand. Tr. R. Irish Ac. xxviii. p. 211, pls. iii. & iv.

WINKLER, T. C. De Huisdieren. Haarlem: 1882.

[Not seen by Recorder; *cf.* Arch. f. Nat. xlix. p. 393.]

WOLDRICH, J. N. Die diluvialen Faunen Mitteleuropas und eine heutige Sareptaner Steppenfauna in Niederösterreich. MT. anthrop. Ges. Wien, xi. p. 183.

Contains remarks on the diluvial Mammals of Middle Europe.

WOODWARD, H. The Ancient Fauna of Essex. Tr. Epping Nat. Club, iii. p. 1.

Gives lists of the numerous *Mammalia* found fossil in Essex, with details of their distribution.

WOOLDRIDGE, L. C. Preliminary Note on the Innervation of the Mammalian Heart. Abstract in P. R. Soc. xxxv. p. 226.

"On the function of the nerves that are to be seen on the surface of the ventricles of the hearts of Mammals."

WORTMAN, J. L. [See *Equidæ*.]

FAUNÆ.

Brazil. [See PELZELN, A. VON.]
Celebes. [See JENTINK, F. A.]
Commander Islands. [See STEJNEGER, L.]
Dalmatia. [See KOLOMBATOVIC, G.]
France. [See LAUZANNE, H. DE, & OLIVIER, E.]
Guiana. [See IM THURN, E. F.]
Hungary. [See MOJSISOVICS, A. VON.]
Ireland. [See PAYNE-GALLWEY, SIR R.]
Jemtland. [See OLSSON, P.]
Labrador. [See STEARNS, W. A.]
Russia, N. [See BUNGE, A., & GRIMM, O.]
Salvador. [See D. J. GUZMAN.]
Scotland. [See DUNS, —, & HORN, W.]
Senegambia. [See ROCHEBRUNE, A. T. DE.]
Siberia. [See NORDQUIST, O., & POLIAKOFF, —. *Muridæ*, infrà.]
Sumatra. [See JENTINK, F. A.]
Swabia. [See WIEDEMANN, A.]
Texas. [See COPE, E. D.]
Thibet. [See PRJEVALSKY, N.]
Trinidad. [See KENNEL, J.]
Manitoba. [See MACOUN, J.]
Mexico. [See SUMICHRAST, F.]
Modena. [See CARUCCIO, A.]
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PRIMATES.

AEBY, —. Das Talo-tarsalgelenk des Menschen und der Primaten. Arch. Anat. Phys. (Phys.-Suppt.) 1883, p. 312.

ALBRECHT, P. Note sur le centre du proatlas chez un *Macacus arctoides*. Bull. Mus. Belg. ii. p. 287.

BROOKS, W. T. The Brachial Plexus of the Macaque Monkey, and its Analogy with that of Man. J. Anat. Phys. xvii. p. 329.

The brachial plexus of the monkey as observed in six specimens is fully described, and the slight differences between it and the human plexus are noted.

BROWN, A. E. The Kindred of Man. Am. Nat. xvii. p. 119.

Contains notes on the habits and mental qualities of chimpanzees, orangs, and other monkeys.

SUTTON, J. B. On the Diseases of Monkeys in the Zoological Society's Gardens. P. Z. S. 1883, p. 581.

Tuberculosis, far from being a common cause of death in monkeys, is extremely rare, the majority dying either of bronchitis or of rickets.

TESTUT, L. Le long fléchisseur propre du pouce chez l'homme et chez les singes. Bull. Soc. Zool. 1883, pp. 164–185.

The author describes the flexor muscles of the hand of several monkeys, and then shows that different human subjects have possessed most of the modifications seen among the higher apes. The flexor pollicis is often more or less fused with the other deep flexors, and thus loses its special human characters.

SIMIIDÆ.

HARTMANN, R. Die menschenähnlichen Affen und ihre Organisation im Vergleich zur menschlichen. Leipzig : 1883, 8vo, pp. 313.

[Not seen by Recorder ; *cf.* Science, ii. p. 668.]

Troglodytes gorilla. On a young specimen obtained for the Berlin Aquarium ; E. Friedel, Zool. Gart. xxiv. p. 86.

Troglodytes niger. On its anatomy ; J. B. Sutton, J. Anat. Phys. xviii. pp. 66–85. Two young male chimpanzees were dissected.

Troglodytes mayema. On the habits of a young specimen of this reputed species while in captivity at Landana; L. Famelart, Bull. Soc. Zool. 1883, p. 149. The author believes that gorillas do not extend much below 5° S. lat.

Simia satyrus. On its habits in captivity ; H. A. A. Niclou, Album Nat. 1882, p. 195.

CERCOPITHECIDÆ.

Macacus. On the habits of and possession of reasoning powers by a young Macaque and other allied monkeys; J. von Fischer, Zool. Gart. xxiv. pp. 177, 193, 227, 257, 289, 325.

Macacus philippinensis. On an albino specimen ; P. Juillerat, La Nature, 1883 (1) p. 17.

Cynocephalus mormon. On its breeding in the Hamburg Zoological Gardens ; W. L. Sigel, Zool. Gart. xxiv. p. 235.

CEBIDÆ.

Protopithecus bonariensis, sp. n. (foss.), Gervais & Ameghino, *op. cit.* (gen. subj.) p. 6, S. America.

CHIROMYIDÆ.

Chiromys madagascariensis. A general account of this species ; E. Coues, Encycl. Amer. i. p. 374, Art. 'Aye-aye.' Notes on its habits in captivity ; Rev. G. A. Shaw, P. Z. S. 1883, p. 44.

Mixodectidæ.

This family contains *Tricentes*, *Necrolemur*, *Mixodectes*, *Microsyops*, and *Cynodontomys*; E. D. Cope, P. Am. Phil. Soc. xxi. p. 318.

Mixodectes pungens and *crassiusculus*, g. & spp. nn. (foss.), *id. op. cit.* xx. p. 559, Puerco Eocene.

Necrolemur is not synonymous with *Anatomorphus*, as asserted by Cope; H. Filhol, Ann. Sci. géol. xiv. Art. 5, p. 3.

Necrolemur and *Adapis*. Skulls and dentition described and figured; *id. l. c.* pls. x.–xii.

Tricentes crassicollidens and *inæquidens*, g. & spp. nn. (foss.), E. D. Cope, P. Am. Phil. Soc. xxi. pp. 315 & 317.

Adapis parisiensis. On some remains of this species from the Quercy phosphorites; H. Filhol, Mém. Quercy Mamm. p. 131.

Lemuravidæ.

Hyopsodus acolytus, sp. n. (foss.), E. D. Cope, P. Am. Phil. Soc. xx. p. 462, Puerco beds, New Mexico

Indrodon malaris, g. & sp. nn. (foss.), *id. op. cit.* xxi. p. 318, Puerco Eocene.

Genus incertæ sedis.

Adapisorex gaudrii, *chevillioni*, *remensis*, and *minimus*, g. & spp. nn., V. Lemoine, C. R. xcvii. p. 1325, Eocene, Reims.

CARNIVORA.

Cope, E. D. On the Systematic Relations of the *Carnivora Fissipedia*. P. Am Phil. Soc. xx. p. 471.

The author divides the land Carnivores into two groups, viz.:—

Hypomycteri, with *Cercoleptidæ*, *Procyonidæ*, *Mustelidæ*, *Æluridæ*, *Ursidæ*, and *Canidæ*; and

Epimycteri, with *Protelidæ*, *Arctictidæ*, *Viverridæ*, *Cynictidæ*, *Suricatidæ*, *Cryptoproctidæ*, *Nimravidæ*, *Felidæ*, *Hyænidæ*.

[See *Plethœlurus*, g. n., *Felidæ*; also Ann. N. H. (5) vii. p. 112.]

Felidæ.

Felis pardus. On a remarkable spotted variety from the east of the Cape Colony; R. Trimen, P. Z. S. 1883, p. 535.

Felis concolor. On its habits in California; L. Stone, Am. Nat. xvii. p. 1190.

Felis bouvieri, sp. n. (Milne-Edwards), A. T. de Rochebrune, Act. Soc. L. Bord. (4) vii. p. 126, Senegambia.

Felis domestica. Note on the structure of the external epithelium of its amnion; S. Trinchese, Rend. Acc. Napoli, xxii. p. 143.

Plethœlurus, g. n., E. D. Cope, P. Am. Phil. Soc. xx. p. 475. "Second (first) superior premolar two rooted; orbit closed behind; pupil round." Formed for *Felis planiceps*, Vig. & Horsf.

Lyncus. A popular account of the species of this group; W. H. Flower, Encycl. Brit. (9) xv. p. 109, Art. 'Lynx.'

Machœrodus, sp. near *neogæus*. On its osteology; W. Branco, Pal. Abh. i. Heft 2, p. 137.

Nimravidæ.

Proælurus medius, sp. n., and *P. julieni* var. *priscus*, var. n. (foss.), H. Filhol, Mém. Quercy Mamm. pp. 75 & 82, pl. iv.

Ælurogale. On its progressive changes in dentition and size; *id. l. c.* p. 1.

Hyænidæ.

Hyæna crocuta var. *spelæa*. On its occurrence in the forest-bed; E. T. Newton, Geol. Mag. (2) x. p. 433, pl. x.

Viverridæ.

Viverra leptor[*r*] *hyncha*, sp. n. (foss.), H. Filhol, Arch. Mus. Lyon, iii. p. 67, pl. iv., Eocene, Isère.

Genetta angolensis, sp. n., B. du Bocage, J. Sci. Lisb. ix. p. 29, Caconda, Angola.

Paradoxurus musschenbroëki. This Celebean species fully described; F. A. Jentink, Notes Leyd. Mus. v. p. 178.

Herpestes crassus, sp. n. (foss.), H. Filhol, *l. c.* p. 63, pl. iv., Eocene, Isère.

Canidæ.

Anučina, D. N. Sobaka, wolk i lisica (Dog, Wolf, and Fox). Moscow: 1882.

On the remains of domestic and other dogs found on the shores of Lake Ladoga. A new form is named *Canis familiaris inostrazewi*. [Not seen by Recorder; *cf.* J. N. Woldrich, MT. anthrop. Ges. Wien, xii. p. 82.]

Cope, E. D. On the Extinct Dogs of N. America. Am. Nat. xvii. pp. 235–249.

The following are the 9 genera found to occur in N. America:—*Amphicyon*, *Temnocyon*, *Galecynus*, *Canis*, *Ælurodon*, *Enhydrocyon*, *Tomarctus*, *Oligobunis*, and *Hyænocyon*. 25 species are recognized, and the skulls and teeth of many of them figured and described. None are stated to be new. Observations on the development of the group are appended.

Grashey, O. Die Rassekennzeichen der bis jetzt durch die deutschen Delegirten-Versammlungen fest gestellten deutschen Hunderassen. Munich: 1883, 8vo.

[Not seen by Recorder; *cf.* Zool. Anz. vi p. 530.]

Mégnin, P. Le Chien : histoire, hygiène, médecine. Paris: 1883, 8vo, pp. 475.

[Not seen by Recorder; *cf.* Le Nat, ii. 1883, p. 302.]

Canis. On an anatomical difference between the wolf and dog; H. Landois, Morph. JB. ix. p. 163. The dog's intestinal canal is from five to six times as long as the body, while that of the wolf is only four times.

Canis lupus. On its ravages in Russia and Livland; M. Braun, Zool. Gart. xxiv. p. 91.

Canis occidentalis occasionally feeds on berries; J. C. Hughes, Am. Nat. xvii. p. 1192.

Canis familiaris. On the prehistoric races of the common dog; J. N. Woldrich, MT. anthrop. Ges. Wien, xii. pp. 27 & 153.

Canis ekloni, sp. n., Prjevalsky, Third Journey to Thibet, p. 216, Thibet.

Canis azaræ-fossilis, cultridens, and *protojubatus*, spp. nn. (foss.), Gervais & Ameghino, *op. cit.* (gen. subj.) pp. 37–39, S. America.

Vulpes melanogaster. This so-called species is only a geographical race of *V. vulgaris*; C. Lepori, Atti Soc. Ital. xxiv. p. 87.

Dinocyon thenardi. Notes on this Eocene species, with figures; H. Filhol, Arch. Mus Lyon, iii. p. 43.

Cynodictis dubius and *rossignoli*, spp. nn., *C. compressidens* var. *viverroides*, *C. crassirostris* var. *viverroides*, and *C. leptorrhynchus* var. *viverroides*, varr. nn. (foss.), Filhol, Mém. Quercy Mamm. pp. 48–62, pls. vi. & vii., Eocene, Quercy.

Cynodon speciosus, sp. n. (foss.), *id. l. c.* p. 41, pl. vi., Eocene, Quercy.

Mustelidæ.

Mustela. On the species of this genus; W. H. Flower, Encycl. Brit. (9) xv. p. 575, Art. 'Marten.'

Mustela martes. On its breeding in captivity; A. H. Cocks, Zool. (3) vii. p. 203. Occurrence in Co. Clare, Ireland; J. F. Darling, Zool. (3) vii. p. 252. On the derivation of the name 'Fomud;' J. Lucas, Studies in Nidderdale (London: 1882, 8vo), p. 130.

Putorius fœtidus. On a specific difference between the polecat and the ferret; J. de Fischer, Rev. Montp. (3) iii. 1883, p. 140 (*cf.* Zool. Anz. vii. p. 333).

Putorius lutreola and *vison.* A popular account of these species; W. H. Flower, Encycl. Brit. (9) xvi. p. 474, Art. 'Mink.'

Putorius itatsi. D. Brauns believes this to be at most a variety of *P. lutreola*; Jen. Z. Nat. xiv. p. 577.

Pœcilogale, g. n., O. Thomas, Ann. N. H. (5) xi. p. 370. Dental formula: $I\frac{3}{3}$, $C\frac{1}{1}$, $P.M.\frac{3}{2}$, $M\frac{1}{1}$ (rarely $\frac{1}{2}$) $\times 2 = 28$ (or 30). Back longitudinally striped. Formed on *Mustela albinucha*, Gray, from Natal.

Conepatus mercedensis, sp. n. (foss.), Gervais & Ameghino, *op. cit.* (gen. subj.) p. 30, S. America.

Meles taxus. On its habits, &c.; Liebe, Ber. Ges. Chemn. viii. p. 64. [Not seen by Recorder; *cf.* Zool. Anz. vii. p. 156.]

Taxidea americana. On this species; E. Coues, Encycl. Amer. i. p. 388, Art. 'Badger.'

Enhydris lutris is nearly exterminated in the Commander Islands; L. Stejneger, P. U. S. Nat. Mus. vi. p. 87. On the number killed in these islands; O. Grimm, *l. c.* (gen. subj.) p. 43.

Plesictis mutatus, sp. n. (foss.), H. Filhol, Arch. Mus. Lyon, iii. p. 64, pl. iv., Eocene, Isère.

Stenoplesictis minor, sp. n. (foss.), *id.* Mém. Quercy Mamm. p. 68, Eocene, Quercy.

Ursidæ.

Ursus. On the calcaneum of a bear from the diluvial sand of Rixdorf, near Berlin; W. Dames, SB. nat. Fr. 1883, p. 105. Only the second carnivore found in these deposits.

Ursus ferox. Notes on a pair in the Cincinnati Zoological Gardens; A. Zipperlen, Zool. Gart. xxiv. p. 321.

Ursus spelæus. On remains from the Cave of Ó-Ruzsin, near Leutschau, in Hungary; A. Török, Math. Nat. Ber. Ung. i. p. 311.

Ursus lagomyiarius, sp. n., Prjevalsky, Third Journey to Thibet, p. 216, with a plate, Thibet.

Ursus americanus. On its myology; F. J. Shepherd, J. Anat. Phys. xviii. pp. 103–117.

Ursus americanus var. *cinnamomeus.* On a Pennsylvanian specimen of this form; F. W. True, P. U. S. Nat. Mus. v. p. 653. Full measurements, both of the animal and its skull, are given.

Hyænarctos. On remains from Pikermi referable to this genus; W. Dames, SB. nat. Fr. 1883, p. 152.

Otariidæ.

Huet, J. La Fourrure d'Otarie. Le Nat. ii. pp. 179, 188, 195, & 203 (1882 & 1883).

A general account of fur-sealing.

Southwell, T. Seals and the Seal Fishery. Tr. Norw. Soc. iii. p. 482.

A history of the progress and development of the northern seal fisheries.

Swan, J. G. Report of Investigations at Neah Bay, Washington, respecting the Habits of the Fur Seals of that Vicinity. Bull. U. S. Fish Comm. iii. p. 201.

Contains notes on the habits of the northern fur seals, based on accounts given by fur-traders and natives.

Otaria fischeri, sp. n. (foss.), Gervais & Ameghino, *op. cit.* (gen. subj.) p. 223, S. America.

Callirrhinus ursinus. On the number killed in the Commander Islands; O. Grimm, *l. c.* (gen. subj.) p. 46.

Trichechidæ.

Trichechus rosmarus and *obesus*. Notes on these species, with figures of skulls; O. Nordquist, Vega Mammals, p. 94.

Phocidæ.

Grunert, J. T. Die Robben der deutschen Küsten. Förstl. Bl. xix. p. 263.

[Not seen by Recorder; *cf.* Arch. f. Nat. xlix. p. 407.]

Histriophoca fasciata. Notes on this rare species, with figures of skull; O. Nordquist, Vega Mammals, p. 107. Its osteological characters described; F. W. True, Am. Nat. xvii. p. 798.

Halichœrus grypus. Further notes on the osteology of this species, with remarks on its systematic position; A. Nehring, SB. nat. Fr. 1883, p. 107, and Zool. Anz. vi. p. 610 [see Zool. Rec. *Mamm.* xix. p. 22]. (The presence of six upper cheek-teeth, believed hitherto to be an unusual abnormality, occurs in about one specimen in every four.) An instance of its breeding at Boscastle, Cornwall, noted; E. R. Lankester, Rep. Brit. Ass. 1883, p. 529. Occurrence on the Norfolk coast; T. Southwell, Zool. (3) vii. p. 76.

Cystophora cristata. A specimen captured on the coast of New Jersey; A. E. Brown, Am. Nat. xvii. p. 1191.

Macrorrhinus leoninus (*Morunga elephantina*). Notes on specimens from Macquarie Island; J. H. Scott, Tr. N. Z. Inst. xv. p. 492, pl. xxxix.

CREODONTA.

Hyænodontidæ.

Hyænodon. Description of the base of its skull; H. Filhol, Bull. Soc. Philom. vii. p. 96. *Hyænodon* differs from all recent Mammals in the structure of the base of its skull, and forms by itself a special group of carnivores.

Hyænodon brachyrrhynchus. Notes on this species; *id.* Mém. Quercy Mamm. p. 9, pl. i.

Leptictidæ.

Quercytherium tenebrosum. Notes on this species; H. Filhol, Mém. Quercy Mamm. p. 30, pl. iv.

Mioclænus ferox, *bucculentus*, and *corrugatus*, spp. nn. (foss.), E. D. Cope, P. Am. Phil. Soc. xx. pp. 547, 555, & 557, Puerco Eocene.

Mioclænus minimus, sp. n. (foss.), *id. l. c.* p. 468, Puerco, New Mexico.

Mioclænus cuspidatus, sp. n. (foss.), *id. op. cit.* xxi. p. 312, Puerco Eocene. A synopsis of the species of *Mioclænus* is appended.

Oxyclænus, g. n. (foss.), proposed for *Mioclænus cuspidatus*, *M. corrugatus*, and ? *M. ferox*; E. D. Cope, *l. c.* pp. 312 & 313.

Triisodon levisianus, sp. n. (foss.), *id. op. cit.* xx. p. 546, Puerco Eocene.

Triisodon rusticus and *assurgens*, spp. nn. (foss.), *id. op. cit.* xxi. pp. 310 & 311, Puerco Eocene.

Deltatherium baldwini and *interruptum*, spp. nn. (foss.), *id. op. cit.* xx. p. 463, Puerco beds, New Mexico.

Chriacus truncatus and *simplex*, spp. nn. (foss.), *id. op. cit.* xxi. pp. 313 & 314, Puerco Eocene.

Oxyænidæ.

Pterodon. Description of the base of its skull; H. Filhol, Bull. Soc. Philom. vii. p. 98. *Pterodon*, by this character, stands close to the bears.

Pterodon dasyuroides. Notes on this Eocene species; *id.* Mém. Quercy Mamm. p. 25, pls. ii. & iii.

Miacidæ.

Didymictis haydenianus and *primus*, spp. nn. (foss), E. D. Cope, P. Am. Phil. Soc. xx. p. 464, & xxi. p. 309, Puerco Eocene, New Mexico.

INSECTIVORA.

Dobson, G. E. A Monograph of the *Insectivora*, systematic and anatomical. Part ii., including the families *Potamogalidæ*, *Chrysochloridæ*, and *Talpidæ*. London: 1883, 4to.

A continuation of the important work on the *Insectivora* noted last year [Zool. Rec. xix. *Mamm.* p. 25]. The present part, like the last, contains a full systematic arrangement, with a detailed account of the osteology and anatomy of the various forms included in it, and also an appendix to the last part, in the shape of notes on the genera *Microgale* and *Geogale*, which should be included in the *Centetidæ*. Fifteen excellent plates illustrate the osteology and anatomy of the species referred to.

Gill, T. On the Classification of the Insectivorous Mammals. Bull. Phil. Soc. Wash. v. p. 118.

The author considers that if *Solenodon* is raised to family rank, as has been done by Dobson, so also should several other forms hitherto reckoned only as subfamilies. He therefore proposes the following new families:—*Rhynchocyonidæ*, *Myogalidæ*, *Oryzorictidæ*, and *Geogalidæ*. He also proposes the names *Dilambdodonta* for the W-toothed Insectivores, and *Zalambdodonta* for the V-toothed.

Leche, W. Zur anatomie der Becken region bei *Insectivora*. Stockholm: 1883.

[Not seen by Recorder; *cf.* Am. Nat. xvii. p. 1269.]

Macroscelididæ.

Macroscelides brachyura, sp. n., J. V. Barboza du Bocage, J. Sci. Lisb. ix. p. 27, Caconda, Angola.

Erinaceidæ.

Erinaceus europæus. On its habits; C. Arndt, Arch. Ver. Mecklenb. xxxvi. p. 192 [*cf.* Zool. Anz. vi. p. 546].

Talpidæ.

This family is arranged into the following groups:—(1) *Myogalæ*, with *Myogale*; (2) *Condyluræ*, with *Condylura*; (3) *Scalopes*, with *Scapanus* and *Scalops*; (4) *Talpæ*, with *Talpa*, *Mogera*, *Parascaptor*, and *Scaptochirus*; (5) *Urotrichi*, with *Scaptonyx*, *Neürotrichus*, and *Urotrichus*; and (6) *Uropsili*, with *Uropsilus*—12 genera in all, and the synonymy and anatomy of their species is worked out. Dobson, *l. c.* pp. 128–172.

Heape, W. The Development of the Mole (*Talpa europea*). The formation of the germinal layers, and early development of the medullary groove and notochord. Q. J. Micr. Sci. xxiii. pp. 412–432, pls. xxviii.–xxxi.

The development is compared to that of mice, Guinea-pigs, &c. [*cf.* Zool. Rec. xviii. *Mamm.* p. 5.]

Talpa. A popular account of the species of this genus; G. E. Dobson, Encycl. Brit. (9) xvi. p. 608, Article 'Mole.'

Soricidæ.

Corsira vulgaris. Case of partial albinism; Héron-Royer, Bull. Soc. Zool. 1883, p. 134.

Centetidæ.

Microgale longicaudata. On its osteology and anatomy; Dobson, Insectivora, p. 86 A.

Geogale aurita. On its osteology and dentition; Dobson, *l. c.* p. 86 E. The author now thinks that this genus should be included in the *Centetidæ* rather than the *Potamogalidæ*.

Potamogalidæ.

Potamogale. Its osteology and anatomy fully described and figured; Dobson, *l. c.* p. 97.

Chrysochloridæ.

Chrysochloris. 5 species of this genus are allowed, and their synonymy, osteology, and anatomy described; Dobson, *l. c.* p. 109.

CHIROPTERA.

NORTON, F. Some Notes on Oxon Bats. Midl. Nat. vi. p. 149.

Notes on the rarity, habits, capture, &c., of the commoner Oxfordshire bats.

PTEROPODIDÆ.

PETERS, W. Ueber die von Herrn Dr. Finsch von den Carolinen Inseln eingesandten Fledermäuse. SB. nat. Fr. 1883, p. 1.

Pteropus ualanus, sp. n., *id. ibid.*, Caroline Islands.

Pteropus insularis, Hombr. & Jacq., is a good species; *id. ibid.*

Pteropus molossinus, Temm. Its habitat, hitherto unknown, is the Caroline Islands; *id. ibid.*

Pteropus wallacii, Gray. The adult of this species, hitherto only known from a young specimen, described; F. A. Jentink, Notes Leyd. Mus. v. p. 172.

Pteropus medius. Notes on its habits in captivity; W. L. Sigel, Zool. Gart. xxiv. p. 182.

Cynonycteris brachyotis recorded from Celebes; F. A. Jentink, *l. c.* p. 173.

VESPERTILIONIDÆ.

Vesperugo leisleri. On its occurrence in Ireland; R. M. Barrington, Zool. (3) vii. p. 116.

Vesperugo noctula var. *lasiopterus*. Occurrence of a bat agreeing with this variety near Venice; A. P. Ninni, Atti Soc. Ital. xxvi. p. 107.

PHYLLOSTOMATIDÆ.

Phyllostoma chrysosema, sp. n. (?), Natterer, A. von Pelzeln, Verh. z.-b. Wien, xxxiii. Anhang.

RODENTIA.

CHATIN. J. Sur l'anatomie comparée des fosses nasales chez les Rongeurs. Bull. Soc. Philom. vii. p. 103.

Describes the nasal region of various rodents.

COPE, E. D. The Extinct *Rodentia* of North America. Am. Nat. xvii. pp. 43, 165 & 370.

A most important paper, containing a full review of all the fossil rodents as yet discovered in North America. They are divided into the Eocene, Miocene, and Pliocene forms, and those belonging to each of these periods are arranged systematically among themselves. The author believes that the *Sciuromorpha* are the lowest and most primitive rodents, while the *Myomorpha* are the highest. The ancient genera as a whole

differ from their modern representatives by their smaller size, more constricted skulls, and their want of post-orbital processes.

Lataste, F. Sur le bouchon vaginale des Rongeurs. Zool. Anz. vi. p. 115, and J. de l'Anat. Phys. xix. p. 144.

The author shows that the "vaginal stopper" is probably common to all rodents, that the mass of it is formed by the vesiculæ seminales of the male, and that it serves to push the spermatozoa sufficiently far before it into the uterus to insure impregnation, and that when this has taken place, the stopper, till then of an adhesive nature, is surrounded by a soft, unctuous, non-adhesive matter secreted by the vagina of the female, which enables it to be more easily discharged. [*Cf.* Zool. Rec. xix. *Mamm.* p. 28, under *Pachyuromys duprasi*.]

Renaut, J. Sur l'épithélium fenêtré des follicules clos de l'intestin du lapin et de ses stomates temporaires. C. R. xcvii. p. 334.

Sciuridæ.

Jentink, F. A. List of the Specimens of Squirrels in the Leyden Museum. Notes Leyd. Mus. v. p. 91.

The present list of the magnificent collection of squirrels in the Leyden Museum practically amounts to a monograph of the genus *Sciurus*, as the full synonymy is given in every case, and notes on the colour, shape of skull, dentition, and other characters are given for all the species of which the collection contains specimens. In all, the Leyden series consists of 656 specimens and 218 skulls and skeletons, belonging to 59 of the 69 species recognized.

Sciuropterus volucella. Habits in confinement; F. G. King, Am. Nat. xvii. p. 36.

Sciurus vulgaris. On its nest; H. Landois, JB. Westf. Ver. xi. p. 20.

Arctomys, *Spermophilus*, and *Cynomys*. A popular account of these genera; O. Thomas, Encycl. Brit. (9) xv. p. 559, Art. 'Marmot.'

Arctomys. On a fossil marmot from Upper Swabia; Probst, JH. Ver. Württ. xxviii. p. 51.

Plesispermophilus angustidens, g. & sp. nn. (foss.), H. Filhol, Bull. Soc. Philom. vii. p. 99, Quercy.

Castoridæ.

Castor fiber. On the trade in its furs; O. Grimm, *l. c.* p. 44 (gen. subj.). On its re-introduction to Great Britain; A. Hawks, Tr. Hertf. Soc. ii. p. 223 (an account of the Bute beaver settlement). Notes on French specimens of the beaver; it still exists in small numbers on the Rhone: P. G., Le Nat. ii. 1883, p. 229. On its occurrence in Holland; H. J. H. Gronemann, Album Nat. 1882, p. 28.

Castor fiber var. *canadensis*. On this animal; E. Coues, Encycl. Am. i. p. 470, Art. 'Beaver.' On an albino specimen from Washington Territory; R. E. C. Stearns, Am. Nat. xvii. p. 1079. On its habits; B. Horsford, Am. Nat. xvii. p. 1197.

Castoroididæ.

Castoroides ohioensis. On an incisor tooth found in Darke County, Ohio; F. W. Langdon, J. Cincinn. Soc. vi. p. 238.

Myoxidæ.

Myoxus glis. On its occurrence near Osnabrück; F. Sickmann, JB. Ver. Osnabr. v. p. 94.

Muridæ.

Deleporte-Bayart, —. Notes sur une invasion de souris, mulots et campagnols dans les campagnes du Nord de la France. Lille : 1883, 8vo. (See Zool. Anz. vi. p. 547.)

Lataste, F. Note sur les souris d'Algérie, et description d'une espèce nouvelle. Act. Soc. L. Bord. (4) vii. pp. 13–33.

The author gives full descriptions, with figures of the skulls of the Algerian species of mice, and a synopsis of all the Western Palæarctic species both of rats and mice. One species is described as new (see *infrà*).

——. Introduction à l'étude des campagnols de France. Le Nat. ii. 1883, pp. 323, 332, 343 & 347.

In this paper, the bibliography of the *Arvicolinæ* is fully traced out, and the genera and subgenera of the group are arranged and defined. The author considers that the system of Blasius, which is founded on the structure of the molars, is radically wrong, and that the subgenera of *Arvicola* should rather be based upon the number of mammæ and foot-pads. The nomenclature of this group is carefully reviewed, and some rather remarkable results arrived at.

Poliakoff, —. Revue systematique des campagnols de Sibérie (Mém. Pétersb. xxix., annexe). Analyse avec annotations critiques, par F. Lataste. Ann. Mus. Genov. xx. pp. 253–301.

The present is a French summary, by F. Lataste, of a paper published in Russian in 1881. Poliakoff describes 16 Siberian species of *Arvicola*, of which 6 are new, and enters fully into their distribution, dental characters, &c.; and Lataste, in a series of footnotes, makes remarks upon that author's methods and results, showing that most or all of his so-called new species are merely varieties of old ones.

Eurygotis anchietæ, sp. n., J. V. Barboza du Bocage, J. Sci. Lisb. ix. p. 26, Caconda, Angola.

Mus. A Maori rat near Greymouth, New Zealand; R. Helms, N. Z. J. Sci. i. p. 466. [Probably, from the description, a specimen of *Mus rattus*, L.]

Mus decumanus and *rattus.* On their distribution in Brazil; A. Nehring, SB. nat. Fr. 1883, p. 49.

Mus rattus occurs commonly in Münsterland, in places where formerly only the Brown Rat was found, and in Greiz appears actually to be increasing in numbers at the expense of that species; P. Magnus, SB. nat. Fr. 1883, p. 47.

Mus alexandrinus. On the occurrence of this species at Norwich; T. Southwell, Tr. Norw. Soc. iii. p. 419.

Mus faberi, sp. n., F. A. Jentink, Notes Leyd. Mus. v. p. 176, North Celebes.

Mus griseo-cæruleus, *leucopus*, *variabilis*, and *simsoni*, spp. nn., E. T. Higgins & W. F. Petterd, P. R. Soc. Tasm. 1882 (pub. 1883), p. 173 *et seq.* pl. iv.

Mus spretus, sp. n., F. Lataste, Act. Soc. L. Bord. (4) vii. p. 27, Algeria.

Mus agrarius. On its distribution near Osnabrück; F. Sickmann, JB. Ver. Osnabr. v. p. 96.

Mus musculus. On singing mice; H. Landois, JB. Westf. Ver. xi. pp. 16 & 21: C. Struck, Arch. Ver. Mecklenb. xxxv. p. 117.

Mus (? *Acanthomys*) *gaudrii*, sp. n. (foss.), W. Dames, Z. geol. Ges. xxxv. p. 98, pl. v. fig. 2, Pikermi.

Hapalotis papuanus, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. viii. p. 18, New Guinea.

Echiothrix leucura. This species is probably restricted to Celebes, although the original type was said to be from Queensland; F. A. Jentink, Notes Leyd. Mus. v. p. 177.

Hesperomys rattus, sp. n. (Natterer), Pelzeln, Verh. z.-b. Wien, xxxiii. Anhang, p. 73, Marabitanas, Brazil.

Rheithrodon fossilis, sp. n. (foss.), Gervais & Ameghino, *op. cit.* (gen. subj.) p. 71, S. America.

Arvicolinæ. An excellent account of the American genera and species of this sub-family; E. Coues, Encycl. Am. i. p. 335, Art. '*Arvicolinæ*.'

Arvicola, Lac. (1801), should give way to *Microtus*, Schrank (1798); *Evotomys*, Coues (1877), to *Myodes*, Pall. (1811); *Myodes*, Pall. (auct.), to *Lemmus*, Tiedem. F. Lataste, Le Nat. ii. 1883, p. 323, &c.

Arvicola terrestris. Notes on Swiss specimens of this Vole; J. J. Pfeiffer, Zool. Gart. xxiv. p. 75. Note on Alsatian specimens; F. Reiber, Bull. Soc. Colmar, 1881–2 (pub. 1883), p. 252.

Arvicola musiniani. Note on the spelling of its specific name; F. Lataste, *l. c.* p. 246.

Arvicola rozianus, Bocage, = *A. agrestis*, Linn; *id. l. c.* p. 373.

Arvicola kamtschaticus, Poliakoff, *op. cit.* p. 272, Kamtschatka (its characters insufficient; Lataste, *l. c.*), *A. wosnessenskii*, p. 280, Kamtschatka, *A. eversmanni*, p. 285, Altai, *A. middendorffi*, p. 289, N. Siberia, *A. nordenskiældi*, p. 290, Taimoursk Peninsula (all these species more or less doubtful; Lataste, *l. c.*), *A. raddii*, p. 299, E. Siberia; spp. nn.

Cuniculus torquatus. On its occurrence, fossil, in Upper Swabia; Probst, JH. Ver. Württ. xxviii. p. 51.

Borioikon, g. n., Poliakoff, *op. cit.* Formed for *Myodes torquatus*, Pall. [to which Wagler's *Cuniculus* (1830) has been already shown by Coues to apply.—Rec.].

Eremiomys, g. n., Poliakoff, *l. c.* Formed to contain *Myodes luteus* and

lagurus. It differs from *Myodes* in having 5 or 6 prisms in the third upper, 7 or 9 in the first lower, and 5 in the third lower molars, instead of 4 or 5, 5, and 4, respectively.

Siphneus arvicolinus, sp. n. (foss.), A. Nehring, SB. nat. Fr. 1883, p. 19 (woodcuts), from lacustrine deposits on the Upper Hoangho.

Geomyidæ.

Cricetodipus parvus, Baird, is a good species; F. W. True, P. U. S. Nat. Mus. iv. p. 474. Measurements of 6 specimens are given. [Omitted from Zool. Rec. xviii. *Mamm.* 1881.]

Dipodidæ.

Lataste, F. Les Gerboises d'Algérie. Ann. Mus. Genov. xviii. pp. 661–683.

An excellent account of the 3 species of Jerboa found in Algeria, with synonymies, descriptions, and notes on their habits in captivity; 1 species is new.

Dipus ægyptius. Notes on its habits in confinement; F. Lataste, Le Nat. ii. 1883, pp. 236, 243, 252 & 260.

Dipus darricarrerii, sp. n., *id.* Ann. Mus. Genov. xviii. p. 661, Algeria.

Dipodillus simoni. On its acclimatization and domestication; *id.* Bull. Soc. Acclim. (3) x. p. 369. Contains also important notes upon the occurrence of rickets and other diseases in captive rodents.

Zapodidæ.

Zapus hudsonius. On its hibernation; C. J. Maynard, J. Bost. Soc. 1883. [Not seen by Recorder; *cf.* Am. Nat. xvii. p. 334.]

Octodontidæ.

Ctenomys latidens and *Myopotamus priscus*, spp. nn. (foss.), Gervais & Ameghino, *op. cit.* (gen. subj.) pp. 67 & 69, S. America.

Chinchillidæ.

Lagostomus antiquus, sp. n. (foss.), F. Ameghino, Bol. Ac. Arg. v. p. 103, Entre Rios.

Lagostomus fossilis, sp. n. (foss.), Gervais & Ameghino, *op. cit.* (gen. subj.) p. 63, S. America.

Caviidæ.

Cerodon major and *minor*, spp. nn. (foss.); *Microcavia typus*, *robusta*, *intermedia*, and *dubia*, g. & spp. nn. (foss.): Gervais & Ameghino, *op. cit.* (gen. subj.) pp. 47–55, S. America.

Hydrochœrus paranensis, sp. n. (foss.), F. Ameghino, Bol. Ac. Arg. v. p. 104, Entre Rios.

Hydrochœrus magnus, sp. n. (foss.), Gervais & Ameghino, *op. cit.* (gen. subj.) p. 45, S. America.

Megamys laurillardi, sp. n. (foss.), Ameghino, Bol. Ac. Arg. v. p. 269, Entre Rios.

Cardiatherium dæringi, g. & sp. nn. (foss.), *id. l. c.* p. 270, Entre Rios.

Leporidæ.

Doederlein, D. Ueber das Vorkommen einer zweiten Hasenart neben *Lepus brachyurus* in Japan, welcher in Winter weiss wird wie *L. variabilis*. MT. Ges. Ostasien's, xxv.

[Not seen by Recorder ; *cf.* Archiv. f. Nat. xlix. p. 413.]

Lepus cuniculus. Note on an abnormal specimen ; G. Haller, Zool. Gart. xxiv. p. 203. On pellets found in its stomach ; G. Dutilleul, Bull. Sci. Nord. v. p. 382, and Morot, Rev. Sci. xxxi. p. 57 (*cf.* Zool. Anz. vi. p. 547). On its placenta ; Laulanié, C. R. xcvi. p. 1588.

"*Cuniculus*" *senegalensis*, sp. n., A. T. de Rochebrune, Act. Soc. L. Bord. (4) vii. p. 120, Senegambia.

Lepus variabilis var. n. *tschuktschorum*, O. Nordquist, Vega Mammals, p. 84.

Genus incertæ sedis.

Mesotherium, Moreno (*nec* Serres), renamed *Mesitotherium* ; Trouessart, Rev. Sci. xxxii. p. 592 (footnote). "Between the *Rodentia* and *Proboscidea*."

UNGULATA.

Cope, E. D. The Classification of the Ungulate *Mammalia*. P. Am. Phil. Soc. xx. pp. 438-447 ; abstract in P. Am. Ass. xxxi. p. 477.

The following is the arrangement now suggested :—

Order I.	*Taxeopoda*.	Sub-orders	*Hyracoidea* and *Condylarthra*.
„ II.	*Proboscidea*.	„	*Proboscidea* and (?) *Toxodontia*.
„ III.	*Amblypoda*.	„	*Pantodonta* and *Dinocerata*.
„ IV.	*Diplarthra*.	„	*Perissodactyla* and *Artiodactyla*.

The pedal characters of the groups are given, the feet of several of the fossil forms being now figured for the first time. A table showing the genetic affinities of the Ungulates is appended. [*Cf.* Zool. Rec. xix. *Mamm.* p. 4.]

PROBOSCIDEA.

Elephantidæ.

Arstingstall, G. On the Breeding of Elephants in Captivity. J. Comp. Med. iii. p. 146.

Elephas indicus. Additional observations on the structure of its female organs; M. Watson, P. Z. S. 1883, p. 517.

Elephas antiquus. On its varieties; Pohlig, SB. Ver. Rheinl. xl. p. 134.

Elephas primigenius. A popular account of this species; W. H. Flower, Encycl. Brit. (9) xv. p. 447, Art. 'Mammoth.' On its pre-glacial age; W. Boyd Dawkins, Geol. Mag. (2) x. p. 331. J. Gunn denies its presence in the Norfolk Forest-bed, it being represented by allied species; Geol. Mag. (2) x. p. 456. Note on a humerus found in Leitmeritz, Bohemia; H. Engelhardt, Verh. geol. Reichsanst. 1882, p. 107. On remains found in Washington Co., Iowa; J. Gass & W. H. Pratt, P. Davenp. Ac. iii. p. 177. On some diminutive mammoth-teeth from the Schipka Cave in Moravia; Schaaffhausen, SB. Ver. Rheinl. xl. p. 60.

Elephas africanus. On the anatomy of an adult male specimen; A. von Mojsisovics, MT. Ver. Steierm. 1883, p. 171, pls. i. & ii. Notes on the anatomy of a female; R. J. Anderson, J. Anat. Phys. xvii. p. 491. On the increase in size and weight in a young male; P. L. Sclater, P. Z. S. 1883, p. 465. On fossil remains from the quaternary beds of Rizzolo, in Sicily; G. Seguenza, Nat. Sicil. ii. pp. 87 & 126.

Mastodon. A general account of this group; W. H. Flower, Encycl. Brit. (9) xv. p. 622, Art. 'Mastodon.' On a tusk from the Govt. Pensa, Russia; H. Trautschold, Bull. Mosc. lviii. p. 416.

Mastodon angustidens. On its occurrence in Eastern Baluchistan; R. Lydekker, Rec. Geol. Surv. Ind. xvi. p. 161.

Mastodon americanus. On a specimen obtained near Freehold, New Jersey; S. Lockwood, P. Am. Ass. xxxi. p. 365 (abstract; published in full in Montreal Herald, Aug. 25, 1882, and in Pop. Science Monthly, Jan. 1883).

Mastodon zaddachi, sp. n. (foss.), A. Jentzsch, Abh. Ges. Königsb. xxiii. p. 201, pl. v., Cranz, on the Baltic.

Dinotherium. On remains found near Vienna; M. Vacek, Verh. geol. Reichsanst. 1882, p. 341.

Dinotherium giganteum. On this species; O. Weinsheimer, Pal. Abh. i. Heft 3, pp. 1–78, pls. i.–iii.

CONDYLARTHRA.

Phenacodontidæ.

Phenacodus. Its manus and pes figured; E. D. Cope, P. Am. Phil. Soc. xx. pp. 440 & 442.

Phenacodus primævus. A cast of its brain cavity described and figured; E. D. Cope, P. Am. Phil. Soc. xx. p. 563, pl. i. Its skeleton described; *id.* Am. Nat. xvii. p. 535, pl. xii.

Phenacodus calceolatus, sp. n. (foss.), *id.* P. Am. Phil. Soc. xx. p. 561, Puerco Eocene.

Periptychidæ.

Periptychus rhabdodon. A cast of its brain cavity described and figured; E. D. Cope, P. Am. Phil. Soc. xx. p. 564, pl. ii.

Periptychus ditrigonus, sp. n. (foss.), E. D. Cope, P. Ac. Philad. 1882, p. 465, and P. Am. Phil. Soc. xx. p. 465, Puerco beds of New Mexico. Referred to *Conoryctes*; P. Ac. Philad. 1883, p. 168.

Periptychus coarctatus, sp. n. (foss.), *id.* P. Ac. Philad. 1883, p. 168, New Mexico.

Haploconus xiphodon, sp. n. (foss.), *id. l. c.* p. 466.

Conoryctes crassicuspis, sp. n. (foss.), *id. ibid.*

Anisonchus agapetillus and *cophater*, spp. nn. (foss.), *id.* P. Am. Phil. Soc. xxi. pp. 320 & 321, Puerco Eocene.

Meniscotheriidæ.

Meniscotherium tapiacitis, sp. n. (foss.), E. D. Cope, P. Am. Phil. Soc xx. p. 470, New Mexico.

Genus incertæ sedis.

Zetodon gracilis, g. & sp. nn. (foss.), E. D. Cope, P. Ac. Philad. 1883, p. 169, Upper Puerco of New Mexico. "May be either Marsupial or Condylarthrous."

PERISSODACTYLA.

Rhinocerotidæ.

Scott, W. B., & Osborn, H. F. On the Origin and Development of the Rhinoceros Group. Nature, xxviii. p. 579.

On Kowalevsky's studies of *Elasmotherium typus* = *Stereocerus*, Duv., see E. D. Cope, Am. Nat. xvii. p. 72.

Rhinoceros tichorrhinus. On remains from Schwenz, Silesia; H. Kunisch, JB. schles. Ges. lx. p. 124, 1882 (pub. 1883). Note on some upper molars; F. Toula, Verh. geol. Reichsanst. 1882, p. 279.

Rhinoceros indicus. On its recent existence in the north-west provinces, with a description of a tracing of an archaic rock-painting from Mirzapore representing its hunting; J. Cockburn, J. A. S. B. lii. pt. 2, p. 56, pls. vii. & viii.

Orthocynodon. On its skull and its relations to other Rhinoceroses; W. B. Scott & H. F. Osborn, Contr. E. M. Mus. Geol. Princeton, No. 3, p. 3. [Not seen by Recorder; *cf.* Zool. Anz. vii. p. 157.]

Aphelops fossiger (foss.) recorded from Mexico, and from the Loup Fork Bed of the valley of the San Francisco River, N. Mexico; E. D. Cope, P. Ac. Philad. 1883, p. 301.

Lophiodontidæ.

Desmatotherium guyoti and *Dilophodon minusculus*, gg. & spp. nn. (foss.), W. B. Scott, Contr. E. M. Mus. Geol. Princeton, No. 3, p. 46. [Not seen by Recorder; *cf.* Zool. Anz. vii. p. 155.]

Tapiridæ.

Tapirus. On the structure of its hoof; T. Kitt, Zool. Gart. xxiv. p. 265.

Tapirus indicus. On a specimen in the Hamburg Zoological Gardens; W. L. Sigel, Zool. Gart. xxiv. p. 185.

Macrauchenidæ.

Oxyodontherium zeballosi, g. & sp. nn. (foss.), F. Ameghino, Bol. Ac. Arg. v. p. 284, Entre Rios.

Ribodon limbato[*-us*], g. & sp. nn. (foss.), *id. l. c.* p. 112, Entre Rios.

Scalabrinitherium bravardi, g. & sp. nn. (foss.), *id. l. c.* p. 108, Entre Rios.

Chalicotheriidæ.

Hyracotherium venticolum. Its manus figured; E. D. Cope, P. Am. Phil. Soc. xx. p. 443.

Chalicotherium. On this genus; M. Schlosser, JB. Mineral. 1883, ii. p. 164.

Palæotheriidæ.

Hippotherium antilopinum. Note on a specimen from Perim; R. Lydekker, Rec. Geol. Surv. Ind. xvi. p. 94.

Equidæ.

Eichbaum, F. On the Cranial Capacity of Horses. Archiv für Thierheilkunde.

The author gives the capacity of the Arabian horse as 712 cub. c.m., Russian 720, and Belgian 768. He finds (1) that the cranial part of the skull is more developed in proportion to the facial in eastern than in western (European) horses; and (2) that the breadth of the skull of eastern is greater in proportion to length than in western horses. [Not seen by Recorder; *cf.* J. Comp. Med. iv. p. 75.]

Goehlert, V. Ueber die Vererbung der Haarfarben bei den Pferden; ein Beitrag zur Vererbungslehre. Z. f. Ethnol. xiv. p. 145.

The author shows (1) that the different colours of horses are a result of domestication; (2) that when the parents are of similar colours the foals have the same colour in four out of five cases, and that when the parents are of different colours the foals have that of one or the other in about one-half of the cases observed; (3) that white and brown are more certainly transmitted than are any other colours; (4) that foals rather more often resemble the mother than the father in colour, especially when the former is black. In a second part of his paper the author works out the influence of the age of the parents upon the sex of the foals, and

shows that the proportion of male foals born increases in proportion to the greater age of the parents, especially of the father.

PIETREMONT, C. A. Les Chevaux dans les temps préhistoriques and historiques. Paris: 1883, 8vo, pp. 776.

A complete account of the history of the domestic horse, as known from its fossil remains and from early traditions and documents.

STEGLICH, B. Ueber den Mechanismus des Pferdehufes mit besonderer Berücksichtigung der Hufrotationstheorie des Prof. Dr. Leclmer in Wien. Inaug. diss. Leipzig: 1883, 8vo.

[Not seen by Recorder; *cf.* Zool. Anz. vi. p. 545.]

WORTMAN, J. L. On the Origin of the Horse. Rev. Sci. xxxi. pp. 705–714 (with figure).

——. Recent Discoveries of Fossil Horses. J. Comp. Med. iii. p. 281.

A general account of the fossil *Equidæ* discovered in North America, with figures of limb-bones.

Equidæ. A popular demonstration of their geological history is given by W. H. Flower, P. Geol. Ass. viii. p. 114.

Equus. On its extinction in America during Pliocene times; S. Garman, P. Bost. Soc. xxii. p. 252. On osteological differences between horses, asses, and mules; J. Arloing, Bull. Soc. d'Anthrop. Lyon, 1883 [not seen by Recorder; *cf.* Zool. Anz. vii. p. 155].

Equus caballus. On its teeth and their diseases; R. Jennings, J. Comp. Med. iii. pp. 143 & 288, & iv. p. 121. On the nomenclature of the arteries of its brain; J. Tereg, JB. Thierarzneisch. Hannover, xv. 1882–3, p. 26 [not seen by Recorder; *cf.* Zool. Anz. vii. p. 155]. On its colour in different countries; Langkavel, Zool. Gart. xxiv. p. 38. The evolution of the American trotting-horse; W. H. Brewer, Am. J. Sci. (3) xxv. p. 299. Its continued progress mathematically calculated; F. E. Nepher, *op. cit.* (3) xxvi. pp. 20 & 86; W. H. Pickering, *tom. cit.* p. 378. An interesting series of papers, showing how the interest taken in trotting-horses has led to their gradual improvement in pace from 3 min. for the mile in 1818 to 2 min. 10¼ sec. at the present time.

Equus caballus. A. Nehring, from the evidence furnished by the numerous fossil remains found during the last ten years in Germany, believes that the horse, far from being, as is usually stated, an animal introduced from Asia, is a wholly indigenous European species, and that it has existed in Central Europe "continuously from the beginning of the Diluvial Period to the present time." He states that, during most of the early Diluvial Period, especially during the Glacial Epoch, a great part of Central Europe was covered with open steppe-land, where horses, identical with the present animal, flourished in great numbers; that then, as the forests grew and the open lands became restricted in extent, the horses became reduced both in number and size, the latter being also owing to their increasing domestication by savage races of men, who would have overworked and otherwise ill-treated them; and that, finally, as man became more civilized, and learnt to treat his animals better, the horses, by this

time all in a state of domestication, increased again to their present numbers and stature. SB. nat. Fr. 1883, p. 50.

Equus grevii. The zebra observed during the Speke and Grant expedition of 1860–63 was probably of this species; J. A. Grant, P. Z. S. 1883, p. 175, with notes on its range and habits in the wild state. See also Sir J. Fayrer, Nature, xxvii. p. 604. Its occurrence at Mombaça; J. A. Grant, Nature, xxvii. p. 366.

Equus andium. A long account, with figures, of its osteology; W. Branco, Pal. Abh. i. Heft 2, pp. 20–110.

Equus rectidens, sp. n. (foss.), Gervais & Ameghino, *op. cit.* (gen. subj.) p. 93, S. America.

Genus incertæ sedis.

Adrotherium depressum, g. & sp. nn. (foss.), H. Filhol, Bull. Soc. Philom. vii. p. 94, Quercy, 'Pachyderm.'

AMBLYPODA.

Coryphodontidæ.

Pantolambda. E. D. Cope considers this genus represents the ancestor of *Coryphodon.* It is placed in the *Amblypoda*, which are divided as follows:—

Astragalus with a head distinct from trochlea, with distal articular facets . . . *Taligrada* (sub-ord. n.).
Astragalus without head; distal facets sub-inferior . . . . . *Pantodonta.*

Am. Nat. xvii. p. 406, and P. Am. Phil. Soc. xx. p. 558.

Pantolambda cavirictus, sp. n. (foss.), E. D. Cope, P. Ac. Philad. 1883, p. 169.

Coryphodon. Its manus and pes figured; E. D. Cope, P. Am. Phil. Soc. xx. pp. 441 & 442.

Coryphodon croydonensis, sp. n. (foss.), E. T. Newton, P. Geol. Ass. viii. p. 250, pl. iii., Eocene beds, Croydon.

TOXODONTIA.

Toxodontidæ.

Toxodontherium compressus [*-um*], g. & sp. nn. (foss.), F. Ameghino, Bol. Ac. Arg. v. p. 105, Entre Rios.

Toxodon gervaisi and *gracilis*, spp. nn. (foss.), Gervais & Ameghino, *op. cit.* (gen. subj.) p. 85, S. America.

Mesotherium pachygnathum, sp. n. (foss.), *iid. l. c.* p. 79, S. America.

ARTIODACTYLA.

Depéret, —. Nouvelles études sur les Ruminants fossiles d'Auvergne. C. R. xcvii. p. 866.

Luchsinger, B. Zur Theorie des Wiederkauens. MT. Ges. Bern, 1883, p. 13.

A short note on the physiology of the act of rumination.

Lydekker, R. Siwalik Selenodont Suina, &c. Pal. Ind. (10) ii. pt. v. pp. 142–176, pls. xxiii.–xxv.

In the present memoir the following arrangement of the Artiodactyles is suggested :—

I. *Suina.*

A. *Bunodonta.*

1. *Suidæ. Sus, Porcula, Babirusa, Hippohyus* (?), *Sanitherium, Amphichœrus, Heterohyus, Chœromorus, Potamochœrus, Palæochœrus.*
2. *Dicotylidæ. Dicotyles, Hyotherium* (?), *Thinohyus, Platygonus.*
3. *Acotherulidæ. Acotherulum, Leptacotherulum.*
4. *Phacochœridæ. Phacochœrus.*
5. *Entelodontidæ. Entelodon, Tetraconodon, Achœnodon.*
6. *Hippopotamidæ. Hippopotamus, Chœropsis, Leptochœrus, Parahyus, Eohyus, Helohyus.*

B. *Selenodonta.*

a. Pentecuspidati.

1. *Anthracotheriidæ. Anthracotherium, Hyopotamus, Rhagatherium, Chœropotamus, Hemichœrus.*

(?) 2. *Mixtotheriodontidæ. Mixtotherium.*

(?) 3. *Diplop[-od-]idæ. Diplopus.*

b. Tetracuspidati.

1. *Merycopotamidæ. Merycopotamus, Chœromeryx, Hemimeryx, Sivameryx.*
2. *Oreodontidæ. Oreodon, Eporeodon, Agriochœrus, Merycochœrus.*

c. Anoplotherina.

1. *Anoplotheriidæ. Anoplotherium, Eurytherium,* &c.

II. *Pachysimia* [with *Cebochœridæ* (*Cebochœrus*)]. Connected with the Bunodont *Suina.*

III. *Ruminantia.* Connected with the Selenodont *Suina.*

The Siwalik genera belonging to the Selenodont *Suina* are then fully worked out and described, many of the fossils being figured. 3 new species are described [see *Anthracotherium hyopotamoides, Hyopotamus giganteus* (*Anthracotheriidæ*), *Propalæomeryx sivalensis* (*Palæomerycidæ*)], and many names, published already with short diagnoses, are confirmed by proper descriptions and figures. [See also Ann. N. H. (5) xii. p. 274.]

Osborn, H. F. On *Achœnodon*, an Eocene Bunodont. Contr. E. M. Mus. Geol. Princeton, No. 3. p. 23.

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

Slee, H. C. The Physiology of Digestion in Ruminants, with practical remarks. J. Comp. Med. iii. pp. 136 & 235.

Wenz, —. Ueber Geweihbildung. JB. Ver. Passau, xii. p. 86.

Notes on the structure and growth of horns and antlers.

Pantolestes belongs to the *Artiodactyla*, and contains, besides the type, the species hitherto called *Mioclænus brachystomus* and *etsagicus*; E. D. Cope, P. Am. Phil. Soc. xx. p. 547.

Anoplotheriidæ.

Deilotherium simplex and *Spaniotherium speciosum*, gg. & spp. nn. (foss.), H. Filhol, Mém. Quercy Mamm. pp. 112–114, Eocene, Quercy. Both allied to *Dichobune*.

Proterotherium cervioides, g. & sp. nn. (foss.), F. Ameghino, Bol. Ac. Arg. v. p. 291, Entre Rios.

Brachytherium cuspidatus [*-um*], g. & sp. nn. (foss.), *id. l. c.* p. 289.

Anoplotherium. On its limbs; M. Schlosser, JB. Mineral. 1883, ii. p. 142. Probably had a third small toe on the hind-, and the rudiment of an index on its fore-feet.

Anoplotherium and *Diplobune*. On these genera, and their relations with other Mammals; *id. l. c.* p. 153.

Anthracotheriidæ.

Anthracotherium hyopotamoides, sp. n. (foss.), R. Lydekker, Pal. Ind. (10) ii. pt. v. p. 152, Sind.

Hyopotamus giganteus, sp. n. (foss.), *id. l. c.* p. 160, Sind.

Mesotherium, Filhol (1880), *nec* Serres, renamed *Metriotherium*; Filhol, Mém. Quercy Mamm. p. 99.

Hemichœrus lamandini, g. & sp. nn. (foss.), *id. l. c.* p. 107, Eocene, Lamandine.

Suidæ.

Andrews, R. R. On the Development of the Teeth in Pig-Embryos. New England Journal of Dentistry, ii. p. 193.

[Not seen by Recorder; *cf.* Science, ii. p. 448.]

Forsyth-Major, C. J. Studien zur Geschichte der Wildschweine. (Gen. *Sus*.) Zool. Anz. vi. p. 295.

The author, basing his investigations entirely on the cranial characters, comes to the conclusion that there are only 4 good living species of *Sus* (restricted), viz., *S. scrofa*, *vittatus*, *verrucosus*, and *barbatus*, and that *S. scrofa* is a comparatively recent offshoot of *S. vittatus*, to which latter some 16 or 17 nominal species are referred, among others *S. andamanensis*, *papuensis*, *taivanus*, *indicus*, and *capensis*.

Strobel, P. Studio comparativo sul teschio del Porco delle Mariere. Atti Soc. Ital. xxv. pp. 21–85 & 163–236, pls. i.–iii., and Arch. Ital. Biol. iii. p. 228 (abstract).

Comparative notes on the skulls of various ancient and modern *Suidæ*. [See also J. N. Woldrich, MT. anthrop. Ges. Wien, xii. p. 82.]

Porcula salvania. On its anatomy; J. G. Garson, P. Z. S. 1883, p. 413. The anatomical differences between this animal and *Sus scrofa* "are very unimportant and few, the chief being the absence in the present specimen of the transverse fold between the gastric cavity and the antrum pylori cum, and of the long Peyer's patch in the intestine, and the presence in the liver of a superficial vena cava, of a small cystic fissure, and its right lateral lobe being considerably larger than the left." As the other characters named by Hodgson do not seem to hold, the author thinks that *Porcula* is not worthy of generic separation, and should be amalgamated with *Sus*.

Babirusa alfurus. A young specimen figured; P. L. Sclater, P. Z. S. 1883, p. 463, pl. xlvii.

Acotherulidæ.

Acotherulum parvus, sp. n. (foss.), H. Filhol, Mém. Quercy Mamm. p. 115, Eocene, Quercy.

Hippopotamidæ.

Hippopotamus amphibius. Further remarks on the young specimen in the Hamburg Zoological Gardens, with notes on its change of teeth, increase of dimensions, habits, &c.; W. L. Sigel, Zool. Gart. xxiv. p. 10. [See Zool. Rec. xix. *Mamm.* p. 34.]

Palæomerycidæ.

Propalæomeryx sivalensis, g. & sp. nn. (foss.), R. Lydekker, Pal. Ind. (10) ii. pt. 5, p. 173, Siwaliks.

Camelidæ.

Poebrotherium labiatum. Its pes figured; E. D. Cope, P. Am. Phil. Soc. xx. p. 443.

Auchenia gracilis and *frontosa*, spp. nn., Gervais & Ameghino, *op. cit.* (gen. subj.) pp. 115 & 117, S. America.

Protauchenia reissi, g. & sp. nn. (foss.), W. Branco, Pal. Abh. i. Heft 2, p. 110, Peru.

Hemiauchenia paradoxa, g. & sp. n. (foss.), Gervais & Ameghino, *op. cit.* (gen. subj.) p. 123, S. America.

Palæolama major, *oweni*, and *mesolithica*, spp. nn. (foss.), *iid. l. c.* pp. 119–121, S. America.

Bovidæ.

Cybulsky, J. B. Das Nervensystem der Schnauze und Oberlippe vom Ochsen. Z. wiss. Zool. xxxix. pp. 653–682, pls. xxxviii. & xxxix.

DAMES, W. Ueber hornlose Antilopen von Pikermi, in Attika. SB. nat. Fr. 1883, p. 25.

Numerous specimens of *Tragoceros amaltheus*, Wagn., and *Gazella brevicornis*, Roth. & Wagn., were found in the Pikermi deposits, both of which species are shown by the author to have had hornless females.

RICHIARDI, S. Sur la distribution des nerfs dans le follicule des poils tactiles à appareil vasculaire érectile chez le bœuf. Arch. Ital. Biol. iv. p. 280.

Bison bonasus. Its reported occurrence in Nishni-Novgorod denied; F. T. Koppen, Beitr. Russ. Reiches (2) vi. p. 244.

Bison americanus. Its history and past and present distribution; E. Coues, Encycl. Amer. i. p. 540, Art. 'Bison.'

Bos. On the distribution of domestic cattle in Africa; B. Langkavel, Z. wiss. Geogr. iv. p. 16.

Bos taurus. On the minute anatomy of five monstrous calves; G. P. Piana, Mem. Acc. Bologn. (4) iv. p. 795 (with 2 pls.). The temperature of cattle is from 100° to 103° Fahr.; J. R. Smith, J. Comp. Med. iii. p. 84.

Bos frontalis. Its occurrence in the wild state denied; J. Sarbo, P. Z. S. 1883, p. 142.

Bos indicus and *frontalis.* On a cross between these species; J. Kühn, Zool. Gart. xxiv. p. 126.

Bos primigenius. On skulls found in Poland; A. Slósarski, "Wiadomosci Archæolog." Heft 4, 1882, p. 40 [not seen by Recorder; *cf.* Zool. Anz. vii. p. 154].

Poephagus mutus, sp. n., N. Prjevalsky, Third Journey to Thibet, p. 190, plate, Thibet.

Ovibos moschatus. On its occurrence in the "Forest-bed" of Norfolk, with notes on its distribution in time and space; W. Boyd Dawkins, J. Geol. Soc. xxxix. p. 575, and Geol. Mag. (2) x. p. 377.

Ovis aries. F. Pommerol shows that the so-called "Mouflon quaternaire" of the Saumur Museum is really only a common sheep; CR. Ass. Fr. Sci. xi. p. 360.

On hybrids between sheep and goats; J. Bamberger, Zool. Gart. xxiv. p. 252.

Antelope argentina, sp. n. (foss.), Gervais & Ameghino, *op. cit.* (gen. subj.) p. 131, S. America.

Platatherium magnum, g. & sp. nn. (foss.), *iid. ibid.* S. America.

Tragelaphus scriptus. On specimens born in the Jardin des Plantes; J. Huet, Bull. Soc. Acclim. (3) x. pp. 323 & 609.

Tragelaphus gratus. Further notes on this species, with figures; P. L. Sclater, P. Z. S. 1883, p. 34, pl. viii. The male of an antelope supposed to be the present one, but differing in its essential characters, described and figured; A. T. de Rochebrune, Act. Soc. L. Bord. (4) vii. p. 170, pl. xi.

Protragelaphus skouzesi, g. & sp. nn. (foss.), W. Dames, SB. nat. Fr. 1883, p. 95, Pikermi; allied to, and probably an ancestor of, the modern *Tragelaphus.* Wagner (Abh. bayer. Ak. viii. p. 155) believes this is the

same as his *Palæoreas lindermayeri*; but Dames (*l. c.* p. 139) retains his original opinion.

Hippotragus and *Oryx*. On their various native names; B. Langkavel, Zool. Gart. xxiv. p. 253.

Connochetes gnu. On the birth of a female in the Jardin des Plantes; J. Huet, Bull. Soc. Acclim. (3) ix. p. 678, & x. p. 95.

Saiga tartarica. On a rudimentary canine in a young specimen of this species; A. Nehring, SB. nat. Fr. 1883, p. 13 (woodcut of skull). This is the only known instance of the occurrence of a canine in a hollow-horned Ruminant.

Antilocapridæ.

Antilocapra americana. A full account of its characters, history, and synonymy; E. Coues, Encycl. Amer. i. p. 237, Art. 'Antelope.'

Giraffidæ.

Lydekker, R. Siwalik *Camelopardalidæ*. Pal. Ind. (10) ii. pt. 4, pp. 99–142, pls. xvi.–xxii.

In this important paper, remains of all the Siwalik species of *Giraffidæ* are fully described and figured. The family is shown to include the genera *Camelopardalis*, *Orasius*, *Vishnutherium*, *Helladotherium*, *Hydaspitherium*, *Bramatherium*, and *Sivatherium*, and is, as a whole, most nearly related to the *Cervidæ*. The differences between the various genera and species are described at length, and seven excellent plates of bones and teeth are appended.

Cervidæ.

Harting, J. E. Hertfordshire Deer Parks. Tr. Hertf. Soc. ii. p. 97.

Meyer, A. B. Die Hirschgeweih Sammlung im kgl. Schlosse zu Moritzburg bei Dresden. Dresden: 1883, fol.

A magnificent work, illustrating the splendid collection of stags' horns preserved in Moritzburg Castle.

Nehring, A. On the Occurrence of Canines in this Family. SB. nat. Fr. 1883, p. 14.

The author gives a list of 17 species in which he had observed canines to be present.

Rütimeyer, L. Beiträge zu einer natürlichen Geschichte der Hirsche. Abh. schw. pal. Ges. x. pp. 3–122, pls. v.–x.

A continuation of the author's former communications on this subject. The present part contains an account, with excellent figures, of the dentition of the recent and fossil *Cervidæ*. [See Zool. Rec. xviii. *Mamm.* p. 24, and xix. *Mamm.* p. 35.]

Alces machlis. On its past and present distribution in European

Russia ; F. T. Koppen, Beitr. Russ. Reiches (2) vi. pp. 141–243. On its os cordis ; J. Somers, P. N. Scot. Inst. vi. p. 75.

Cervus. On a fossil mandible from the "Torbiera di Trana"; A. Pottis, Atti Soc. Tor. xviii. p. 701.

Cervus elaphus. On a hornless male ; R. Peck, Verh. z.-b. Wien. xxxii. SB. p. 33. On its distribution in Ireland; see Payne-Gallwey, *supra*, Gen. Subj.

Cervus dama. A. Nehring shows that this species, known to have been introduced to North Europe from the South within historic times, was also present in North Germany during the pre-glacial epoch, so that its introduction in the Middle Ages was merely a return to its ancient habitat ; SB. nat. Fr. 1883, p. 68.

Cervus axis. Note on its habits ; W. H. Ravenscroft, P. Z. S. 1883, p. 465.

Cervus pentelici, sp. n. (foss.), W. Dames, Z. geol. Ges. xxxv. p. 93, pl. v. fig. 1, Pikermi.

Cervus dubius, *tuberculatus*, and *brachyceros*, spp. nn. (foss.), Gervais & Ameghino, *op. cit.* (gen. subj.) p. 125–127, S. America.

Cervus euryceros. On its varieties; Pohlig, SB. Ver. Rheinl. ix. p. 136. [Omitted from Zool. Rec. xix. See Arch. f. Nat. xlix. p. 420.]

Capreolus caprea. On abnormalities in this species interesting from a Darwinistic point of view ; H. Nitsche, JB. Tharand. Ges. 1883, pp. 35 [not seen by Recorder ; *cf.* Zool. Anz. vi. p. 531]. On the shedding of its teeth and the development of its horns; L. Schlachter, Zool. Gart. xxiv. p. 161. A very large series of skulls were examined, among which was one with, on one side, a lower tooth, the 5th in the jaw, placed 8·5 mm. in front of the premolars. This tooth the author considers as the true canine, the 4th tooth in the lower jaw, ordinarily accounted a canine, being, therefore, only an incisor.

Rangifer. On the species of this genus; A. T. de Rochebrune, J. de l'Anat. Phys. xix. pp. 586–607, pls. xli. & xlii. The author attempts to prove that the woodland caribou and the barren-ground caribou of North America are different species, and states that the same two forms are also found together in Lapland, a sufficient proof to many people that the two races cannot be specifically separated.

Rangifer tarandus. On its occurrence in the Commander Islands; B. Dybowski, Verh. z.-b. Wien. xxxiii. SB. p. 19.

Cariacus virginianus. On an abnormal right horn; F. W. True, P. U. S. Nat. Mus. vi. p. 151.

Cariacus paludosus. Notes on this species; H. de Saussure, Mém. Soc. Phys. Genèv. xxviii. Art. 6 (with 2 plates of horns).

SIRENIA.

Manatidæ.

Manatus. A popular account of this genus, with figures, given by W. H. Flower, Encycl. Brit. (9) xv. p. 456, Art. 'Manatee.'

Manatus inunguis. Natterer's full notes and anatomical descriptions of this form published ; A. von Pelzeln, Verh. z.-b. Wien, xxxiii. p. 88.

Manatus americanus. On traces of vertebral epiphyses; P. Albrecht, Bull. Mus. Belg. ii. p. 35. pl. ii.

Rhytinidæ.

Rhytina gigas. On remains found in the Commander Islands; L. Stejneger, P. U. S. Nat. Mus. vi. p. 78. The author fully works out the sexual differences observed by himself and Dr. Dybowski in the skulls of this species. In the males the breadth is considerably more than half the length ; in the females it is just about or less than half. Measurements of five male and three female crania and five male and five female mandibles, are given. *R. gigas*, and not *R. stelleri*, is the correct name for this animal. (See also B. Dybowski, P. Z. S. 1883, p. 72.)

Genera incertæ sedis.

Dioplotherium manigaulti, g. & sp. nn. (foss.), E. D. Cope, P. Ac. Philad. 1883, p. 52, Miocene of South Carolina. Had two upper incisors, and is thus a step towards the unspecialized ancestors of the *Sirenia*.

Chronozoon australe, g. & sp. nn. (foss.), C. W. De Vis, P. Linn. Soc. N. S. W. viii. p. 392, pl. xvii., from the Darling Downs, New South Wales. Believed to be related to the recent Sirenians.

CETACEA.

Brown, J. T. Some Notes on Whales. Bull. U. S. Fish Comm. iii. p. 411.

The habits of the *Cetacea* of the Massachusetts coast are noted.

Flower, W. H. On Whales, Past and Present, and their Probable Origins. P. R. Inst. x. p. 360.

A popular lecture on the relations and affinities of the *Cetacea*.

Malm, A. W. Skelettdelar af hval, insamlade under expeditionen med Vega 1878–1880. Bihang Sv. Ak. Handl. viii. No. 4, pp. 1–114.

On the Cetacean bones obtained during the Vega Expedition. Bones of *Beluga catodon*, *Rachianectes glaucus*, *Balæna mysticetus* ("forma pitlekajensis," Malm), *Orca eschrichti* ("forma beringensis," Malm), and *Berardius vegæ*, sp. n., are described and figured.

On the structure of the caudal fins of *Cetacea* ; see Roux, W., *suprà*.

Balænidæ.

Beauregard, H. Recherches sur l'encéphale des Balænides. J. de l'Anat. Phys. xix. pp. 481–516, pls. xxvi.–xxxi.

Tullberg, T. Bau und Entwicklung der Barten bei *Balænoptera sibbaldi*. N. Act. Ups. (3) xi. Fasc. 2, Art. iii. pp. 36, pls. i.–vii.

An important memoir on the structure and development of whalebone,

which the author compares and contrasts with rhinoceros horn, *Rhytina* mouth-plates, and other similar structures.

Balæna biscayensis. Under the name of *B. cisarctica*, Cope, E. B. Holder gives an account of three specimens, said to be of this species, stranded at different times on the east coast of North America; Bull. Am. Mus. Nat. Hist. i. pp. 99–137. Four plates are given, showing the external and skeletal characters. The author believes that this species, supposed long ago to have become all but extinct, is now, owing to a cessation of pursuit since the discovery of the Greenland Right Whale, increasing in numbers, and regaining its former place as one of the important members of the Atlantic fauna. [Critique on this paper by J. A. Allen, Science, i. p. 598, and reply by author, *op. cit.* ii. p. 133. Discussion continued, *op. cit.* ii. pp. 134, 266 & 267.] On its occurrence on the east coast of Scotland; T. Southwell, P. N. H. Soc. Glasg. v. p. 66.

Balænoptera. An abstract of Prof. Burmeister's work on the Argentine species of this genus [*cf.* Zool. Rec. xviii. *Mamm.* p. 2] is given in Ann. N. H. (5) xii. p. 190.

Balænoptera borealis. On a specimen taken on the coast of Essex; W. H. Flower, P. Z. S. 1883, p. 513. The sternum in its natural relation to the ribs is figured.

Balænoptera australis. Notes on its skeleton, with figures of its pelvic bone and sternum; J. Von Haast, P. Z. S. 1883, p. 592.

Balænoptera velifera, Cope, recorded from the Commander Islands; L. Stejneger, P. U. S. Nat. Mus. vi. p. 74.

Megaptera longimana. On remains from gravel on the line of the Canada Pacific Railway, near Smith's Falls, Ontario, 440 feet above the sea; J. W. Dawson, Am. J. Sci. (2) xxv. p. 200, and Canad. Nat. x. p. 385.

Megaptera indica, sp. n., H. P. Gervais, C. R. xcvii. p. 1566, Persian Gulf.

Megaptera lalandii. Description of the skeleton of a specimen stranded in New Zealand; J. Von Haast, Tr. N. Z. Inst. xv. p. 214.

Pachycetus robustus and *humilis*, g. & spp. nn. (foss.), P. J. Van Beneden, Bull. Ac. Belg. (3) vi. p. 27, Oligocene of Lower Brunswick.

ZEUGLODONTIDÆ.

Zeuglodon. On remains found in Egypt; W. Dames, SB. Ak. Berl. 1883, p. 130, and SB. nat. Fr. 1883, p. 3. The first occurrence of this genus in Africa. Two forms were found, corresponding to Müller's *Z. macrospondylus* and *brachyspondylus*, from America, and the author suggests that these may be merely the two sexes of the same species.

PHYSETERIDÆ.

Hyperoodon rostratus. A general account of this species; T. Southwell, Tr. Norw. Soc. iii. p. 476.

Kogia greyi. Description and figures of its brain; W. A. Haswell, P. Linn. Soc. N. S. W. viii. p. 437, pl. xxi.

Ziphius novæ-zelandiæ. Further notes on this species, with figures of its teeth; J. von Haast, P. Z. S. 1883, p. 590.

Ziphius (?) *cavirostris.* Occurrence on the New Jersey coast; F. W. True, Science, ii. p. 540.

Ziphius grebnitzkii, sp. n., L. Stejneger, P. U. S. Nat. Mus. vi. p. 77, Bering Island.

Berardius (?) *bairdi*, sp. n., *id. l. c.* p. 75, Bering Island.

Berardius vegæ, sp. n., A. W. Malm, *l. c.* (under "CETACEA") p. 109, Bering Straits.

PLATANISTIDÆ.

Pontoporia blainvillii. On a gravid uterus; H. P. Gervais, C. R. xcvii. p. 760 [*cf.* Zool. Anz. vii. p. 158].

DELPHINIDÆ.

CHABRY, L., & BOULART, R. Note sur un fœtus de Dauphin et ses membranes. J. de l'Anat. Phys. xix. p. 572, pl. xxxix.

FLOWER, W. H. On the Characters and Divisions of the Family *Delphinidæ*. P. Z. S. 1883, pp. 466–513.

An important memoir on the present family, in which the genera are arranged and defined; the species included in them are noted, and in some cases have their full characters and synonymy worked out. The pterygoid bones, on the formation of which considerable stress is laid, are figured in the case of the greater number. The genera recognized are 17 in number, viz., *Monodon*, *Delphinapterus*, *Phocæna*, *Neomeris*, *Orcella*, *Orca*, *Pseudorca*, *Globiceps*, *Grampus*, *Feresia* (?), *Cephalorrhynchus*, *Tursiops*, *Steno*, *Sotalia*, *Lagenorrhynchus*, *Clymenia*, and *Delphinus*.

Orca gladiator. Note on a specimen stranded at Dieppe; H. G. de Nerville, C. R. xcvii. p. 1569.

Orca cetoniensis, sp. n. (foss.), G. Capellini, Mem. Ac. Bologn. (4) iv. p. 665, 4 pls., Cetona, Tuscany.

Globicephalus melas. Remarks on the synonymy, osteology, and anatomy of this species; G. Riggio, Nat. Sicil. ii. pp. 7, 33, & 52. Occurrence on the Devonshire Coast; W. S. M. D'Urban, Zool. (3) vii. p. 76.

Grampus griseus. On a specimen from Palermo; G. Riggio, Nat. Sicil. i. p. 189.

Grampus rissoanus. Notes on a specimen caught in the Adriatic; E. F. Trois, Atti Ist. Venet. (6) i. p. 735.

Steno rostratus. Its full synonymy worked out; W. H. Flower, P. Z. S. 1883, p. 484.

Lagenorrhynchus albirostris. On a specimen captured off the Bell Rock, West Scotland; J. M. Campbell, P. N. H. Soc. Glasg. v. p. 24. Occurrence off Yarmouth; T. Southwell, Tr. Norw. Soc. iii. p. 421. On its viscera; J. Cleland, P. N. H. Soc. Glasg. v. p. 178. On specimens found subfossil, 137 feet above sea-level, near Holmestrand, Norway, in 1878;

G. A. Guldberg, Forh. Selsk. Chr. 1882, No. 3 (twenty skulls and numerous other bones were found).

Delphinus delphis. A remarkable skull described and figured; it perhaps represents a new species or variety, provisionally named *D. delphis* var. *curvirostris*: G. Riggio, Nat. Sicil. ii. p. 157, pl. iii..

EDENTATA.

ALBRECHT, P. Note sur le pelvisternum des Édentés. Bull. Ac. Belg. (3) vi. p. 265.

The author considers that the azygous bone found between the pubes of certain Edentates corresponds in the posterior limb-girdle to the sternum in the anterior, and a complete list of the homologous parts of the two girdles is given. [See also the reports on this paper by P. J. Van Beneden, C. Van Bambeke, and E. Van Beneden, *tom. cit.* pp. 123–126.]

BRADYPODIDÆ.

Bradypus tridactylus. On its urinogenital organs; A. R. Spoof (see above, General Subject).

MEGATHERIIDÆ.

Megatherium. On the members of this genus; W. H. Flower, Encycl. Brit. (9) xv. p. 829, Art. 'Megatherium.'

Megatherium gervaisi and *lundi*, spp. nn. (foss.), Gervais & Ameghino, *op. cit.* (gen. subj.) pp. 137 & 139, S. America.

Promegatherium smaltatus [*-um*], g. & sp. nn., F. Ameghino, Bol. Ac. Arg. v. p. 293, Entre Rios.

Olygodon [*Olig-*] *pseudolestoides*, g. & sp. nn. (foss.), *id. l. c.* p. 299, Entre Rios.

Scelidotherium tarijense and *capellinii*, spp. nn. (foss.), Gervais & Ameghino, *op. cit.* (gen. subj.) p. 149, S. America.

Mylodon sauvagii, *wieneri*, and *zeballozi*, spp. nn. (foss.), *iid. l. c.* p. 157, S. America.

Promylodon, g. n. (foss.), Ameghino, Bol. Ac. Arg. v. p. 298. Formed for *Mylodon* (?) *paranensis*, sp. n. (foss), *id. l. c.* p. 114, Entre Rios.

Lestodon bravardi, *gaudrii*, *bocagii*, and *blainvillii*, spp. nn. (foss.), and *Pseudolestodon reinhardti*, *moreni*, *debilis*, *bisulcatus*, and *trisulcatus*, g. & spp. nn. (foss.), Gervais & Ameghino, *op. cit.* (gen. subj.) pp. 159–171, S. America.

DASYPODIDÆ.

Xenurus loricatus, sp. n. (Natterer), Pelzeln, Verh. z.-b. Wien, xxxiii. p. 102, Mattogrosso, Brazil.

Eutatus seguini, Gerv. Description of the carapace and skeleton of this rare quaternary Armadillo: H. Burmeister, SB. Ak. Berl. 1883, pp. 1045–1062, pl. xiii.

Glyptodontidæ.

Ameghino, F. Sobre la necesidad da borrar el Genero *Schistopleurum*, y sobre la clasificacion y sinonimia de los Glyptodontes en general. Bol. Ac. Arg. v. p. 1.

On the necessity of sinking the genus *Schistopleurum*, and on the classification and synonymy of the *Glyptodontidæ* in general. Gives full synonymy of the species, and diagnoses of the 7 genera recognized.

Glyptodon principalis, sp. n. (foss.), Gervais & Ameghino, *op. cit.* (gen. subj.) p. 205, S. America.

Hoplophorus imperfectus, *perfectus*, and *burmeisteri*, spp. nn. (foss.), *iid. l. c.* pp. 193–197, S. America.

Hoplophorus paranensis, sp. n. (foss.), F. Ameghino, Bol. Ac. Arg. v. p. 116.

Euryurus, g. n. (foss.), Gervais & Ameghino, *op. cit.* (gen. subj.) p. 185. Formed on *Glyptodon rudis*, P. Gerv.

Dædicurus uruguayensis and *poucheti*, spp. nn. (foss.), *iid. l. c.* p. 183, S. America.

Palæhoplophorus, g. n. (foss.), Ameghino, Bol. Ac. Arg. v. p. 301. Formed for *Glyptodon* (?) *antiquus*, sp. n. (foss.), *id. tom. cit.* p. 115, Entre Rios.

Thoracophorus elevatus, g. & sp. nn. (foss.), Gervais & Ameghino, *op. cit.* (gen. subj.) p. 207, S. America.

Chlamydotherium paranense, sp. n. (foss.), F. Ameghino, Bol. Ac. Arg. v. p. 114, Parana.

Chlamydotherium typus, sp. n. (foss.), Gervais & Ameghino, *op. cit.* (gen. subj.), p. 211, S. America.

MARSUPIALIA.

De Vis, C. W. On Tooth-marked Bones of Extinct Marsupials. P. Linn. Soc. N. S. W. viii. p. 187.

Numerous fossil Marsupial bones from the Darling Downs are found to be scored with tooth-marks, some manifestly those of the *Thylacoleo*.

Fletcher, J. J. On the Existence after Parturition of a Direct Communication between the Median Vaginal Cul-de-sac, so-called, and the Urogenital Canal, in certain species of Kangaroos. P. Linn. Soc. N. S. W. vi. p. 796.

——. On some Points in the Anatomy of the Urogenital Organs in Females in certain species of Kangaroos. Pt. i., *op. cit.* vii. p. 640; pt. ii., *op. cit.* viii. p. 6.

Continuations of the researches referred to in Zool. Rec. xviii. *Mamm.* p. 30.

Osborn, H. F. Observations upon the Fœtal Membranes of the Opossum and other Marsupials. Q. J. Micr. Sci. xxiii. pp. 473–484,

pl. xxxiii.; abstracts in Science, i. p. 451, Zool. Anz. vi. p. 418, and Arch. Z. expér. (2) i. p. xlv.

The author confirms the statements of Owen, Chapman, and others as to the yelk-sac in the Marsupials performing the functions of the allantois in the *Placentalia*, and in addition he has discovered that nourishment is conveyed to the fœtus by means of vascular villi placed on the outer surface of the subzonal membrane, over the attached portion of the yelk-sac.

Poulton, E. B. On the Tongues of the *Marsupialia*. P. Z. S. 1883, pp. 599-628, pls. liv. & lv.

The author describes and figures the structure of the tongue of *Macropus*, *Halmaturus*, *Petrogale*, *Dasyurus*, *Phalangista*, *Belideus*, *Acrobata*, *Perameles*, and *Didelphys*, and propounds a theory as to the evolution of the papillæ and taste-bulbs.

Dasyuridæ.

Dasyurus maugei. On its urinogenital organs; A. R. Spoof (see above, General Subject).

Antechinus rolandensis, *leucogenys*, and *niger*, spp. nn., E. T. Higgins & W. F. Petterd, P. R. Soc. Tasm. 1882 (pub. 1883), p. 171 *et seq.*, Tasmania.

Peramelidæ.

Perameles nasuta. On the structure of its tongue; E. B. Poulton, Q. J. Micr. Sci. xxiii. p. 69, pl. i.

Perameles myoides, sp. n., A. Günther, Ann. N. H. (5) xi. p. 247, New Britain.

Macropodidæ.

De Vis, C. W. On a Fossil Humerus. P. Linn. Soc. N. S. W. viii. p. 404.

The author believes that the humerus referred by Prof. Owen to *Nototherium* did not belong to it, and that a bone now described from the Darling Downs is really the humerus of that animal.

Dendrolagus dorianus, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. viii. p. 17, Mt. Astrolabe, New Guinea.

Brachalletes palmeri, g. & sp. nn. (foss.), C. W. De Vis, P. Linn. Soc. N. S. W. viii. p. 190, Chinchilla, Queensland.

Palorchestes azael. Description of a lower jaw; *id. l. c.* p. 221.

Phalangistidæ.

Belideus gracilis, sp. n., C. W. De Vis, P. Linn. Soc. N. S. W. vii. p. 619, Northern Queensland.

Phascolarctus cinereus. On its urinogenital organs; A. R. Spoof (see above, General Subject).

Didelphyidæ.

Didelphys incertus, sp. n. (foss.), Gervais & Ameghino, *op. cit.* (gen. subj.) p. 223, S. America.

Plagiaulacidæ.

Thylacoleo carnifex. On an outline of its skull; R. Owen, Geol. Mag. (2) x. p. 289, pl. vii. On its affinities and skeletal characters; *id.* Phil. Tr. clxxiv. pp. 575 & 639, pls. xxxix.-xli. & xlvi.; abstracts in P. R. Soc. xxxv. pp. 19 & 163. The author shows that several parts of the skeleton of this animal strongly resemble the corresponding parts in the placental carnivores, evidence confirmatory of his opinion that *Thylacoleo* was carnivorous in its habits.

Neoplagiaulax. On this Eocene genus, and its relations to the Mesozoic *Plagiaulacidæ*; Lemoine, Bull. Soc. Géol. xi. pp. 249-271.

Chirox plicatus, g. & sp. nn. (foss.), E. D. Cope, P. Am. Phil. Soc. xxi. p. 321, Puerco Eocene.

Catopsalis fissidens, sp. n. (foss.), *id. l. c.* p. 322, Puerco Eocene.

Genera incertæ sedis.

Sthenomerus charon, g. & sp. nn. (foss.), C. W. De Vis, P. Linn. Soc. N. S. W. viii. p. 11, Gowrie Creek, Queensland. "In dentition the animal diverges considerably from *Nototherium*—more so from *Diprotodon*; its divergence is towards the *Macropodidæ*."

Sceparnodon ramsayi, g. & sp. nn., R. Owen, P. R. Soc. xxxvi. p. 3, Australia. Of about the size of *Diprotodon*, with remarkable scalpriform incisors.

Pleuraspidotherium. Note on this genus; Lemoine, Bull. Soc. Géol. xi. p. 349.

MONOTREMATA.

Ornithorrhynchidæ.

Albrecht, P. Sur la fente maxillaire double sous-muqueuse, et les 4 os intermaxillaires de l'Ornithorynque adulte normale. Bruxelles: 1883, 8vo.

[Not seen by Recorder; *cf.* Zool. Anz. vii. p. 334.]

Lankester, E. Ray. On the right cardiac valve of *Echidna* and of *Ornithorrhynchus*. P. Z. S. 1883, p. 8, pls. iii. & iv.

Further researches, based on more abundant material, on the subject noted last year [Zool. Rec. xix. *Mamm.* p. 39]. The heart of *Echidna* is intermediate between those of *Ornithorrhynchus* and other Mammalia

Figures are given of the hearts of *Ornithorrhynchus*, *Echidna*, *Lepus*, *Casuarius*, and *Crocodilus*.

Ornithorrhynchus anatinus. On the structure of its tongue; E. B. Poulton, Q. J. Micr. Sci. xxiii. pp. 453–472, pl. xxxii. See also C. S. Minot, Science, ii. p. 750.

Echidnidæ.

Echidna aculeata. Its temperature is only about 28° C. (82° 4 F.); N. de Miklukho Maclay, P. Linn. Soc. N. S. W. viii. p. 425.

Echidna ramsayi, sp. n. (foss.), R. Owen, P. R. Soc. xxxvi. p. 4, New South Wales.

Proechidna bruijni. The three-toed *Echidna* was provisionally named *Proechidna* by Gervais in 1877, a fact which had not been observed by the Recorder before writing the note on its name last year [*cf.* Zool. Rec. xix. *Mamm.* p. 40]. *Bruijnia* and *Acanthoglossus* are both, therefore, synonyms of *Proechidna*. [Rec.]

AVES.

BY

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Without any striking novelty in the way of ornithological publications, the year 1883 was remarkable for a large amount of steady work. British ornithology will receive an impetus from the issue of Seebohm's "History of British Birds," and the British Ornithologists' Union "List of British Birds."

The General Subject. See Allen, Coppinger, Cory, Coues, Forbes (S. A.), Gadow, Harting, King, Newton, Oustalet, Russ, Sharpe.

Bibliography and Criticism. See Coues, Ingersoll, Newton, Reichenow, Schalow.

Palæarctic Region. See Blakiston, Booth, Cocks, Coues, Dybowski, Giglioli, Homeyer, Job, Jouy, Kocyan, Lepori, Loewis, Menzbier, Müller, Nelson, Oustalet, Prjevalsky, Ridgway, Saunders, Seebohm, Severtzow, Slater, Stejneger, Sundevall, Taczanowski.

Ethiopian Region. See Bocage, Boehm, Butler, Forbes (W. A.), Hartlaub, Pelzeln, Rochebrune, Schalow, Seebohm, Sharpe, Shelley.

Indian Region. See Blasius, Davison, Eastlake, Kutter, Nicholson, Oates, Parker, Vorderman.

Australian Region. See Gould, Milne-Edwards, Ramsay, Sclater, Travers, Tristram.

Nearctic Region. See Allen, Belding, Brewster, Brown, Hartlaub, McIlwraith, Ridgway, Smith, Stearns, Stejneger, Wheaton.

Neotropical Region. See Barrows, Boucard, Berlepsch, Cory, Pelzeln, Ridgway, Salvin, Sclater, Taczanowski, White.

Anatomy and Physiology. See Bellonci, Cattie, Dollo, Eimer, Gadow, Hoffmann, Jeffries, Johnson, Lescuyer, Meyer, Parker, Paroni, Richet, Rossi, Watson, Weldon.

Oology. See Bailey, Campbell, Crowley, Ramsay, Seebohm, Sundman.

THE GENERAL SUBJECT.

Bericht über die Leistungen in der Naturgeschichte der Vö
des Jahres 1882. [See Pelzeln, Reichenow.]

Report (of the British Association Committee) on

Birds. Fourth Report, 1882. London : 1883, 8vo, pp. 1–105. [See also Rep. Brit. Ass. 1883, pp. 283–288.]

VI. Jahresbericht (1881) des Ausschusses für Beobachtungs-stationen der Vögel Deutschlands. J. f. O. 1883, pp. 13–76.

Careful records of the occurrence of Birds throughout the German Empire, with the times of advent and departure of the migratory species, notes on food, &c. Most useful for comparison with the works of similar Committees in other countries.

A List of British Birds, compiled by a Committee of the British Ornithologists' Union. 1883, 8vo, pp. i.–xxxi. & 1–229.

The total number of species admitted into the British list is 376, of which 128 are resident, 52 summer visitors, 31 winter visitors, and 165 occasional visitors.

ADAMSON, C. M. Another Book of Scraps, principally relating to Natural History. With thirty-six lithographic illustrations from pen and ink sketches of Wild Birds. Newcastle: 1882, oblong 4to, pp. 1–56, pls. i.–xxxvi.

The work of an intelligent naturalist, whose sketches, though rough, are very characteristic.

ALLEN, J. A. On Trinomial Nomenclature. Zool. 1883, pp. 97–100.

——. Note on Exceptions to the Law of Increase in Size Northward among North American Birds. Bull. Nutt. Orn. Club, viii. pp. 80–82.

——, & BREWSTER, W. List of Birds observed in the vicinity of Colorado Springs, Colorado, during March, April, and May, 1882. *Tom. cit.* pp. 151–161, & 189–198.

1 new species [*Mniotiltidæ*].

APLIN, F. C., [REV.] B. D'O., & O. V. A List of the Birds of the Banbury District. (Reprint.) J. Northampt. Soc. ii. pp. 320–330.

AUDEBERT, J. Beitrag zur Kenntniss der Vögel Madagaskars. Gef. Welt, xii. pp. 345, 346, 461, 462, 470, 471, & 503.

AUDOUIN, J. V. Explication sommaire des planches d'oiseaux de l'Égypte et de la Syrie, publiées par J. C. Savigny. [Edited by A. Newton.] London: 1883, 8vo, pp. i.–vii. & 1–138. [Willughby Society (reprint).]

BAILEY, H. B. Memoranda of a Collection of Eggs from Georgia Bull. Nutt. Orn. Club, viii. pp. 37–43.

BARROWS, W. B. Birds of the Lower Uruguay. *Tom. cit.* pp. 82–94, 128–143, & 198–212.

So little has been written on the ornithology of Uruguay, that these notes form a very useful contribution to our knowledge. 1 new [*Tringillidæ*].

S. Fragments of the Natural History of Pennsylvania. O. Salvin.] Part 1. London: 1883, 4to, pp. i.–xviii. & hby Society (reprint).]

BELDING, L. List of Birds found at Guaymas, Sonora, in December, 1882, and April, 1883. P. U. S. Nat. Mus. vi. pp. 342 & 343.

——. Second Catalogue of a Collection of Birds made near the southern extremity of Lower California. [Edited by R. Ridgway.] *L. c.* pp. 344–352.

——. Catalogue of a collection of Birds made at various points along the Western Coast of Lower California, North of Cape St. Eugenio. *Op. cit.* v. pp. 527–550.

The localities are the Coronados Islands, Santa Rosalia Bay [lat. 28° 28′], and Cerros Island.

——. Catalogue of a Collection of Birds made near the southern extremity of the Peninsula of Lower California. [Edited by R. Ridgway.] *L. c.* pp. 532–550.

BELLONCI, G. Sui lobi ottici degli Uccelli. Atti Soc. Ital. xxvi. pp. 42–47, tav. iii.

BENNETT, K. H. [See *Megapodiidæ*.]

BERLEPSCH, H. VON. Descriptions of Three New Species of Birds from Brazil. Ibis, 1883, pp. 137–142. [*Tyrannidæ*, *Dendrocolaptidæ*.]

——. Descriptions of Six New Species of Birds from Southern and Central America. Ibis, 1883, pp. 487–494, pl. xiii. [*Tanagridæ*, *Dendrocolaptidæ*, *Troglodytidæ*, *Tyrannidæ*, *Pipridæ*, *Trochilidæ*.]

——, & TACZANOWSKI, L. Liste des oiseaux receuillis par MM. Stolzmann et Siemiradzki dans l'Écuadeur occidental. P. Z. S. 1883, pp. 536–577, pl. l.

216 species recorded, of which 6 are new to science. [*Vireonidæ*, *Tanagridæ*, *Fringillidæ*, *Turdidæ*, *Troglodytidæ*, *Certhidæ*, *Tyrannidæ*, *Dendrocolaptidæ*, *Trochilidæ*, *Cypselidæ*, *Columbidæ*, *Rallidæ*.]

BERNSTEIN, H. A. [See MUSSCHENBROEK.]

BLAKISTON, T. W. Zoological Indications of Ancient Connections of the Japan Islands with the Continent. Tr. A. S. Japan, 1883, p. 126.

——. Ornithological Notes. Chrysanthemum, i. pp. 424–428, 471–475, 521–525 (1882).

——. Ornithological Notes, II. Autumn collecting at Sapporo, Yezo. *L. c.* pp. 26–36.

——. III. Messrs. Jouy and Smith's late collections. *L. c.* pp. 76–81.

——. IV. Incidental remarks. *L. c.* pp. 172–174.

BLASIUS, W. Vögel von Borneo, im Südosten der Insel gesammelt [illegible] Herrn F. J. Grabowsky. Verzeichnet und mit Bezugnahme [illegible] gesammte Vögelfauna der Insel besprochen. Verh. z.-b. W[illegible] pp. 1–90.

This most elaborate essay comprises an analytical r[illegible] papers written on the Avifauna of Borneo since Sal[illegible] Borneo" (1874). The critical notes are, as usual[illegible]

[Blasius, W.] Ueber neue und zweifelhafte Vögel von Celebes. J. f. O. 1883, pp. 113–162.

——. Ueber eine kleine Sammlung von Vögeln aus Java. III. JB. Ver. Braunschweig, pp. 78–88. [*Diceidæ*.]

——. Ueber warscheinlich schon von den eingebornen Sammlern und Jägern ausgeführte Fälschungen von Vogelbälgen aus Ecuador. *L. c.* pp. 68–71.

Points out so-called species as probably "made up" by native collectors.

——. [See also *Alcidæ*.]

Bocage, J. V. Barboza du. Observações ácerca de algumas Aves d'Angola. J. Sci. Lisb. No. xxxiv. 1883, pp. 65–79. [*Accipitres, Psittaci, Prionopidæ, Dicruridæ, Laniidæ, Ploceidæ, Emberizidæ*.]

——. Aves das possessões Portuguezas da Africa occidental. Vigesima quarta Lista. *L. c.* pp. 80–84.

——. [See also *Nectariniidæ*.]

Boehm, R. Ornithologische Notizen aus Central-Africa. J. f. O. 1883, pp. 162–208.

In continuation of the author's paper [Zool. Rec. xix. *Aves*, p. 2]. The list of species observed contains the names of many West African Birds, whose ranges, thus extended to Central Africa, possess great interest. Excellent field notes are given.

——. [See Schalow, H.]

Bolau, H. [See *Anseres*.]

Booth, E. T. Rough Notes on the Birds observed during Twenty Years' Shooting and Collecting in the British Islands. Parts 4 & 5. London: 1883, folio.

[*Corvidæ, Fringillidæ, Motacillidæ, Turdidæ, Sylviidæ, Anatidæ, Pelecanidæ*.]

Boucard, A. On a Collection of Birds from Yucatan. With notes by O. Salvin. P. Z. S. 1883, pp. 434–460.

170 species recorded, with excellent field-notes by the collector, Mr. G. F. Gaumer.

Brewster, W. On a Collection of Birds lately made by Mr. F. Stephens in Arizona. Bull. Nutt. Orn. Club, viii. pp. 21–36.

Completion of the paper, which sustains its interest [Zool. Rec. xix. *Aves*, p. 3]. 1 species described as new [*Perdicidæ*].

On an apparently new Gull from Eastern North America. *L. c.* 214–219. [*Laridæ*.]

s on the Birds observed during a Summer Cruise in the Gulf vrence. P. Bost. Soc. xxii. pp. 364–368.

, J. A.]

]

Brown, N. C. A Catalogue of the Birds known to occur in the Vicinity of Portland, Me. Portland : 1882, 8vo, pp. 1–37.

——. Immaturity v. Individual Variation. Bull. Nutt. Orn. Club, vii. pp. 45–48.

Brusina, S. Anomalien der Ornis Croatica. MT. orn. Ver. Wien, 1883. Describes varieties of colour in Birds in the Agram Museum.

Buchanan, J. H. [See *Corvidæ*.]

Butler, E. A., Feilden, H. W., & Reid, S. G. On the Variations in Plumage of *Saxicola monticola*, as observed in Natal. Ibis, 1883, pp. 331–337. [*Turdidæ*.]

——. [See also Sharpe, R. B.]

Cabanis, J. [See *Picidæ*, *Cinclidæ*, *Troglodytidæ*, *Pteroptochidæ*, *Fringillidæ*, *Tanagridæ*, *Dendrocolaptidæ*, *Tyrannidæ*, *Corvidæ*, *Ploceidæ*.]

Campbell, A. J. Nests and Eggs of Australian Birds, embracing papers on "Oology of Australian Birds," read before the Field Naturalists' Club of Victoria. Melbourne: 1883, 8vo, pp. i.–iv., 1–73, & i.–xxx.

Field notes, with photographs of eggs of some of the rarer species.

Cattie, J. T. Notice sur deux monstruosités observées chez le *Gallus domesticus*. Bull. Ac. Belg. (3) v. pp. 119–126, pl. i.

Chamberlain, M. New Brunswick Notes. Bull. Nutt. Orn. Club, viii. pp. 6–11.

Cocks, A. H. An Autumn Visit to Spitzbergen. Zool. 1883, pp. 393–409 433–448, & 479–488.

Contains extended notices of the Birds met with.

Coppinger, R. W. Cruise of the 'Alert.' Four years in Patagonian, Polynesian, and Mascarene Waters (1878–82). London : 1883, 8vo, pp. i.–xiv. & 1–256.

Contains many excellent notes on the habits of Birds.

Cordeaux, J. [See *Corvidæ*.]

Cory, C. B. Beautiful and Curious Birds of the World. Parts v. [omitted from Zool. Rec. xviii.], vi., & vii., fol.

Concludes the work. The species figured are mentioned under the headings of their respective families [*Paradiseidæ*, *Charadriidæ*, *Plataleidæ*].

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Alectoropodes, *Alaconidæ*, *Ampelidæ*, *Anatidæ*, *Anseres*, *Anserinæ*, *Anthinæ*, *Aramidæ*, *Ardeidæ*, Auk, Avocet, Bill or Beak of Birds, Birds (North American), Bobolink, Bob-white, Bullfinch, Bunting, Buzzard, Caracara, Cardinal, *Carinatæ*, Cat-bird, *Cathartidæ*; Encyclopædia Americana, a Supplemental Dictionary of Arts, Sciences, and General Literature. Vol. I. New York, Philadelphia, and London : 1883, 4to.

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—— [See *Anatidæ*, *Limicolæ*.]

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——. [See *Phasianidæ*, *Pelecanidæ*, *Psittaci*, *Alcedinidæ*.]

OWEN, R. [See *Ratitæ*.]

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Several rare species are noticed, 1 being new [*Timeliidæ*].

PRJEVALSKY, N. Tretye Puteshestvie v Centralnoi Asii. Iz Zaizana cherez Khami v Tibet i na verkhovya Joltoi Raki. [Third Journey to Central Asia. From Zaisan, *viâ* Hami to Tibet and the headwaters of the Yellow River.] St. Petersburg: 1883, 4to, pp. i.–iv., i., ii., & 1–476, maps, plates, and woodcuts.

This work being written in Russian, with no index, it is impossible to follow the author. Several names appear to be new, but no descriptions are to be found.

RAMSAY, E. P. Contributions to Australian Oology. Part ii. P. Linn. Soc. N. S. W. vii. pp. 406–415.

In continuation of the author's former paper [Zool. Rec. xix. *Aves*, p. 14], some of the eggs being figured on the plates which accompany that

essay. Notes on the nidification of the following species are given:—*Struthidea cinerea* (pl. iii. figs. 4 & 6), *Artamus minor* (pl. iii. figs. 9 & 10), *Xerophila leucopsis* (pl. iii. fig. 7), *Graucalus hypoleucus* (pl. iii. fig. 11), *Malurus cruentatus*, *Phaps histrionica*, *Clamydodera maculata* (pl. iii. fig. 2), *Ocyphaps lophotes*, *Glareola grallaria*, *Eudromias australis*, *Recurvirostra rubricollis*, *Erythrogenys cinctus*, *Herodias pacifica*, *Aquila morphnoides*, *Accipiter cirrhocephalus*, *Milvus affinis*, *Gypoictinia melanosternus*, *Falco hypoleucus*, *Melicophila picata*.

[Ramsay, E. P.] Notes on Birds from the Solomon Islands. P. Linn. Soc. N. S. W. vii. pp. 664–673.

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Ridgway, R. Catalogue of a Collection of Birds made in the Interior of Costa Rica by Mr. C. C. Nutting. P. U. S. Nat. Mus. v. pp. 493–502.

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——. Notes upon some Rare Species of Neotropical Birds. Ibis, 1883, pp. 399–401.

——. [See *Mniotiltidæ*, *Charadriidæ*, *Plataleidæ*, *Tubinares*, *Motacillidæ*, *Turdidæ*.]

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SALVADORI, T. [See *Ratitæ.*]

SALVIN, O. A List of the Birds collected by Captain A. H. Markham on the West Coast of America. P. Z. S. 1883, pp. 419–434.

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——. [See BARTON & BOUCARD.]

——, & GODMAN, F. D. Biologia Centrali-Americana; or, Contributions to the Knowledge of the Fauna and Flora of Mexico and Central America. Zoology. Parts xxii., xxiii., xxvi., *Aves*, pp. 209–224.

Completes the description of the *Vireonidæ*, and carries the work to the commencement of the *Tanagridæ*. [*Ampelidæ, Hirundinidæ, Cœrebidæ, Tanagridæ.*]

——, ——. Notes on Birds from British Guiana [Zool. Rec. xix. *Aves*, p. 17]. Ibis, 1883, pp. 203–212, pl. ix. [*Troglodytidæ, Vireonidæ, Tanagridæ, Oxyrrhamphidæ, Tyrannidæ, Pipridæ, Cotingidæ, Dendrocolaptidæ, Formicariidæ, Psittacidæ, Columbidæ.*]

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——. [See VIEILLOT.]

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——. Literarische Rundschau. *L. c.* pp. 209–212.

——. Ueber die Fortschritte auf dem Gebiete der Ornithologie in den letzten fünf Jahren in faunistischer Beziehung. *L. c.* pp. 225–255.

A review of ornithological progress from 1878–1883, conveniently arranged under the headings of Zoological Regions.

——. [See *Cypselidæ.*]

—— [See REICHENOW.]

SCHMIDT, MAX. [See *Pelecanidæ*.]

SCLATER, P. L. On Birds collected in the Timor-Laut, or Tenimber Group of Islands, by Mr. Henry O. Forbes. P. Z. S. 1883, pp. 48–58, pls. xi.–xiv.

Out of 54 species procured, 25 were new. [*Striges*, *Psittaci*, *Muscicapidæ*, *Campophagidæ*, *Laniidæ*, *Diceidæ*, *Meliphagidæ*, *Sturnidæ*, *Megapodiidæ*.]

——. Additional Notes on Birds collected in the Timor-Laut, or Tenimber Group of Islands, by Mr. Henry O. Forbes. *L. c.* pp. 194–200, pls. xxvi.–xxviii. [*Oriolidæ*, *Muscicapidæ*, *Laniidæ*, *Meliphagidæ*.]

——. Descriptions of Five apparently New Species of South-American *Passeres*. L. c. pp. 653 & 654, pl. lxi. [*Mniotiltidæ*, *Tanagridæ*, *Dendrocolaptidæ*.]

——. On Birds from New Britain, New Ireland, and the Solomon Islands. *L. c.* pp. 347 & 348.

——. A Review of the Family *Icteridæ*. Part. II. *Icterinæ*. Ibis, 1883, pp. 352–374, pl. xi.

The genus *Icterus* is here monographed, with 37 species, of which 3 belong to the subgenus *Hyphantes*, 24 to *Pendulinus*, and 10 to *Icterus*. *I. graceannæ* figured (pl. xi.).

——. [See *Vulturidæ*, *Paradiseidæ*, *Formicariidæ*, *Tyrannidæ*, *Icteridæ*, *Pelecanidæ*.]

——. [See WHITE.]

SEEBOHM, H. A History of British Birds, with coloured illustrations of their Eggs. London: 1883, 8vo, pts. i. & ii., pp. i.–xvi. & 1–614, pls. i.–x., xii., xiv., xvi., xvii., xx.–xxiv. & xxxvi.; pt. iii. pp. 1–288, pls. xiii., xv., xix., xxv.–xxx., xxxvii. & xxxviii.

The illustrations surpass any yet attempted. The author adopts the specific name employed by the majority of standard ornithologists, and a great simplicity of nomenclature is attained. An excellent review of Palæarctic species allied to British forms, is given in every article.

——. Notes on the Birds of the Caucasus. Ibis, 1883, pp. 1–37.

The author has done good service in giving a digest of Bogdanow's work, inaccessible to the general reader. Some good critical notes are added. [*Corvidæ*, *Picidæ*, *Pteroclidæ*.]

——. Remarks on the Thrushes of the Ethiopian Region. *L. c.* pp. 163–165. [*Turdidæ*.]

——. [See *Strigidæ*, *Laniidæ*, *Motacillidæ*, *Hirundinidæ*.]

SEVERTZOW, N. A. On the Birds of the Pamir Region. Ibis, 1883, pp. 48–83.

A most important paper, to which Seebohm has contributed some valuable critical notes. 121 species are treated of, and comparisons of the avifauna with that of other portions of Central Asia are given. 4 new species are described. [*Turdidæ*, *Motacillidæ*, *Fringillidæ*.]

——. [See *Anatidæ*.]

SHARPE, R. B. Catalogue of the *Passeriformes*, or Perching Birds, in the Collection of the British Museum. *Cichlomorphæ*. Part. iv., containing the concluding portion of the family *Timeliidæ* (Babbling Thrushes). [Vol. vii. of the Catalogue of Birds.] 1883: 8vo, pp. i.–xvi. & 1–700, pls. i.–xv.

——. Note on *Saxicola monticola*, with special reference to the observations of Majors Butler & Feilden and Capt. Reid. Ibis, 1883, pp. 337–347. [*Turdidæ*.]

——. [See BUTLER, E. A., & GOULD, JOHN.]

—— [See also *Diceidæ*.]

SHELLEY, G. E. A List of the Birds collected by the late Mr. W. A. Forbes in the Niger Region. Ibis, 1883, pp. 538–562, pl. xiv.

105 species enumerated, of which 1 is new [*Charadriidæ*.]

——. On the *Columbidæ* of the Ethiopian Region. *L. c.* pp. 258–330. [*Columbæ*.]

——. [See also *Fringillidæ*, *Ploceidæ*.]

SCHUFELDT, R. W. [See *Charadriidæ*, *Pelecanidæ*.]

SLATER, H. H. Field Notes in Norway in 1881. Zool. 1883, pp. 4–14 & 53–60. [See *Gruidæ*.]

SMITH, CECIL. On the Distinctions between various nearly-allied or similar forms of Birds, with special reference to those known to have occurred in the county (Somersetshire). P. Somerset. Soc. 1883, pt. 2, pp. 1–40, with 4 pls.

Gives distinguishing characters of various British Birds, with good explanatory plates.

SMITH, E. The Birds of Maine, with annotations of their comparative abundance, dates of migration, breeding habits, &c. Forest and Stream, xix. Nos. 22–26, xx. Nos. 1–7, 10–13. [*Cf.* Bull. Nutt. Orn. Club, viii. pp. 164–166.]

SNELLEMAN, J. F., in P. J. Veth's "Midden Sumatra." Leiden: 1882, 4to, *Aves*.

Four plates are published, but the Recorder has seen no letterpress as yet. [*Nectariniidæ*, *Muscicapidæ*, *Columbæ*, *Phasianidæ*.]

STEARNS, W. A. New England Bird Life: being a Manual of New England Ornithology. Revised and edited from the MSS. of W. A. Stearns, by E. Coues. Part ii. Non-Oscinine *Passeres*, Birds of Prey, Game, and Water Birds. New York: 1883, 8vo, pp. 409.

This book is concluded, and forms a very useful manual, being admirably edited by Coues.

——. Notes on the Natural History of Labrador. P. U. S. Nat. Mus. vi. pp. 111–137.

111 species of birds recorded.

STEJNEGER, L. Contributions to the History of the Commander Islands. No. 1. Notes on the Natural History, including descriptions of new Cetaceans. P. U. S. Nat. Mus. vi. pp. 58–89.

A very full and well-written account of the author's recent expedition to this little-known locality. [See also RIDGWAY, R.]

——. Remarks on the Systematic Arrangement of the American *Turdidæ* [q. v.]. *Op. cit.* v. pp. 449–483.

STEPHENSON, H. Ornithological Notes from Norfolk. Zool. 1883, pp. 313–327.

STREETS, T. H. [See *Laniidæ*.]

SUNDEVALL, C. J. [the late]. Svenska Foglarna, Fortsättning af Prof. J. G. H. Kinberg. Häft 23–28, oblong 4to, pp. 353–755.

Continues the work with the *Scolopacidæ*, *Ardeidæ*, *Plataleidæ*.

SUNDMAN, G. Finnische Vögeleier. Eggs of Finnish Birds; with text by J. A. Palmén. Pt. 5. Helsingfors: 1883, oblong 4to.

Contains excellent illustrations of the eggs of the *Limicolæ* of Finland. The species figured are the following:—*Charadrius morinellus*, *C. curonicus*, *C. hiaticula*, *C. apricarius*, *Strepsilas interpres*, *Machetes pugnax*, *Hæmatopus ostrilegus*, *Vanellus cristatus*, *Actitis hypoleucus*, *Totanus ochropus*, *T. calidris*, *T. glareola*, *T. glottis*, *T. fuscus*, *Numenius phæopus*, *N. arcuata*, *Limosa lapponica*, *L. ægocephala*, *Larus ridibundus*, *L. fuscus*, *L. glaucus*, *L. marinus*, *L. minutus*, *L. canus*, *L. tridactylus*, *L. argentatus*.

TACZANOWSKI, L. Description des espèces nouvelles de la collection péruvienne de M. le Dr. Raimondi de Lima. P. Z. S. 1883, pp. 70–72, pl. xvii.

[See *Tanagridæ*, *Phytotomidæ*, *Tyrannidæ*, *Dendrocolaptidæ*, *Trochilidæ*, *Psittaci*.]

——. Liste supplémentaire des oiseaux recueillis par le Dr. Dybowski au Kamtschatka et aux îles Comandores. Bull. Soc. Z. Fr. viii. pp. 329-347.

Supplementary notes to the author's former paper [Zool. Rec. xix. *Aves*, p. 20], especially relating on the present occasion to Game-birds and Sea-birds. [*Paridæ*, *Tetraonidæ*, *Pelecanidæ*.]

——. [See BERLEPSCH, H. VON.]

TANCRÈ, C. A. [See HOMEYER, E. F. VON.]

TOWNSEND, C. H. Notes on the Birds of Westmoreland County, Penna. P. Ac. Philad. 1883, pp. 59–68.

TRAVERS, W. T. L. Remarks upon the Distribution within the New Zealand Zoological Sub-region of the Birds of the Orders *Accipitres*, *Passeres*, *Scansores*, *Columbæ*, *Gallinæ*, *Struthiones*, and *Grallæ*. Tr. N. Z. Inst. xv. pp. 178–187.

Gives a review of the principal features of New Zealand Avifauna, with tables showing the distribution of the various genera.

TRISTRAM, H. B. On the Position of the Acrocephaline Genus *Tatare*, with descriptions of two new Species of the Genus *Acrocephalus*. Ibis, 1883, pp. 38–46, pls. i. & ii. [*Turdidæ*.]

——. Notes on the Birds of Fanning Island, Pacific. *L. c.* pp. 45–58.

8 species recorded, 6 of which are Water-birds.

VAN AKEN, A. G. [See *Picidæ*.]

VIEILLOT, L. P. Analyse d'une nouvelle Ornithologie Élémentaire. [Edited by Howard Saunders.] London: 1883, 8vo, pp. i.–iv. & 1–70. [Willughby Society (reprint).]

VORDERMAN, A. G. Bataviasche Vögels, v. Nat. Tijdschr. Nederl. Ind. xliii. pp. 176–197.

Continues the author's field-notes on the Birds of Java [Zool. Rec. xix. *Aves*, p. 21].

WALTER, A. Unarten der Spechte. J. f. O. 1883, pp. 317–320.

WATSON, M. Zoology of the Voyage of H. M. S. 'Challenger.' Pt. xviii. Report on the anatomy of the *Spheniscidæ*. London: 1883, 4to, vii. pp. 1–244, pls. i.–xix.

WELDON, W. F. N. On some Points in the Anatomy of *Phœnicopterus* and its allies. P. Z. S. 1883, pp. 638–655, pls. lix. & lx. [*Phœnicopteridæ*].

WHEATON, J. M. Report on the Birds of Ohio. Rep. Geol. Surv. Ohio, pt. 1, pp. 188–628.

[Not seen by Recorder; *cf.* Bull. Nutt. Orn. Club, viii. pp. 110–112.]

WHITAKER, G. J. S. Sulla migrazione degli Uccelli, principalmente in Sicilia. Nat. Sicil. i. pp. 122–127.

WHITE, E. W. Supplementary Notes on the Birds of the Argentine Republic. With remarks by P. L. Sclater. P. Z. S. 1883, pp. 37–43, pl. ix.

33 species mentioned; 1 is new [*Fringillidæ*].

——. Further Notes on the Birds of the Argentine Republic. *L. c.* pp. 432–434.

9 species added to the author's previous list [Zool. Rec. xix. *Aves*, p. 20].

WILSON, C. W. [See *Sturnidæ*.]

ACCIPITRES.

FALCONES.

VULTURIDÆ.

Sarcorrhamphus equatorialis figured; P. L. Sclater, P. Z. S. 1883, p. 349, pl. xxxv.

Falconidæ.

Sub-fam. Accipitrinæ.

Astur candidissimus, sp. n., Kamtschatka, B. Dybowski, Bull. Soc. Z. Fr. viii. pp. 353–355.

Melierax mechowi [Zool. Rec. xix. *Aves*, p. 22], ? distinct from *M. polyzonus*; J. V. Barboza du Bocage, J. Sci. Lisb. xxxiv. pp. 65–67.

Sub-fam. Aquilinæ.

Haliaetus hypoleucus, sp. n., Bering Island, R. Ridgway, P. U. S. Nat. Mus. vi. pp. 90–93.

Sub-fam. Falconinæ.

Archibuteo lagopus is an *Aquila*; H. Seebohm, Hist. Brit. B. i. p. 111.

Falco subbuteo in Ireland; R. J. Ussher, Zool. 1883, p. 122.

Falco candicans in Sussex; T. J. Monk, *tom. cit.* pp. 34 & 35.

Tinnunculus alaudarius. Characters of the sexes in nestling birds; T. C. Aplin, *tom. cit.* pp. 496 & 497.

STRIGES.

Bubonidæ.

Scotopelia oustaleti, sp. n., Senegambia, A. T. de Rochebrune, Bull. Soc. Philom. (7) vii. p. 165.

Bubo blakistoni, sp. n., Yezo, H. Seebohm, P. Z. S. 1883, p. 466.

Bubo ignavus in Scotland; J. M. Campbell, P. N. H. Soc. Glasg. v. pp. 221–223.

Asio accipitrinus figured; H. H. Giglioli, Iconogr. Avif. Ital. fasc. xxi.

Ninox goldiei, sp. n., S.E. New Guinea, J. H. Gurney, Ibis, 1883, pp. 169–172.

Ninox forbesi, sp. n., Loetoer, Timor Laut, P. L. Sclater, P. Z. S. 1883, p. 52, pl. xxxi. Figured; J. Gould, B. New Guinea, pt. xv.

Strigidæ.

Strix dominicensis, sp. n., Santo Domingo, C. B. Cory, Bull. Nutt. Orn. Club, viii. p. 95.

Strix sororcula, sp. n., Larat, Timor Laut, P. L. Sclater, P. Z. S. 1883, p. 52.

PASSERIFORMES.

PASSERES.

Corvidæ.

Corvus corax kamtschaticus, Kamtschatka, and *C. corax behringianus*, Bering Island, spp. nn., B. Dybowski, Bull. Soc. Z. Fr. viii. pp. 362 & 363.

Corvus corax figured; E. T. Booth, Rough Notes, pt. 4.

Garrulus glandarius. Its migrations; J. Cordeaux, Zool. 1883, pp. 1–3. *G. atricapillus*, subsp. *anatoliæ*, Asia Minor, and subsp. *caspius*, Lenkoran, H. Seebohm, Ibis, 1883, pp. 7 & 8.

Cyanocorax tucumanus, sp. n., Tucuman, J. Cabanis, J. f. O. pp. 216 & 217.

Gymnocitta cyanocephala and *Picicorvus columbianus*. Breeding habits; B. F. Goss, Bull. Nutt. Orn. Club, viii. pp. 43–45.

Heteralocha gouldi. Skeleton figured; A. B. Meyer, Abbild. Vogelsk. taf. xlvii.

Fregilus graculus in Scotland; J. H. Buchanan, P. Phys. Soc. Edinb. vii. pp. 94–101.

Paradiseidæ.

A review of the Family; see Musschenbroek.

Paradisea susannæ, sp. n., Dentrecasteaux Island, E. P. Ramsay, P. Linn. Soc. N. S. W. viii. pp. 21–23 [= *P. decora*; Salvin and Godman, Ibis, 1883, pp. 131 & 199–202, pl. viii.]. *P. raggiana*: its nest and eggs; *id. l. c.* p. 26.

Manucodia atra. Its egg; *id. l. c.* p. 25.

Epimachus speciosus and *E. ellioti* (pt. v.), *Chlamydodera maculata*, *Lophorrhina atra*, *Paradisea sanguinea* (pt. vi.), *P. apoda*, *Drepanornis albertisi* (pt. vii.), figured; C. B. Cory, Beautiful and Curious Birds, fol.

Drepanornis albertisi cervinicauda, subsp. n., S.E. New Guinea; P. L. Sclater, P. Z. S. 1883, p. 578. Its nest and egg; E. P. Ramsay, *l. c.* pp. 28 & 29.

Oriolidæ.

Mimeta decipiens, sp. n., Larat, Tenimber Islands, P. L. Sclater, P. Z. S. 1883, pp. 199 & 200.

Dicruridæ.

Dicrurus divaricatus. Remarks on; J. V. Barboza du Bocage, J. Sci. Lisb. xxxiv. pp. 71 & 72.

Prionopidæ.

Platylophus lemprieri, sp. n., N.E. Borneo, F. Nicholson, Ibis, 1883, p. 88.

Bradyornis ater in Benguela; J. V. Barboza du Bocage, J. Sci. Lisb. xxxiv. pp. 70 & 71.

Rectes ferruginea and *Collyriocincla rufigaster*. Eggs described; E. P Ramsay, P. Linn. Soc. N. S. W. viii. pp. 26 & 28.

Grallina bruijni figured; J. Gould, B. New Guinea, pt. xiv.

Campophagidæ.

Graucalus axillaris figured; J. Gould, B. New Guinea, pt. xiv. *G. unimodus*, sp. n., Larat, Timor Laut, P. L. Sclater, P. Z. S. 1883, p. 55. *G. kochi*, sp. n., Mindanao, J. Kutter, J. f. O. 1883, pp. 103 & 104.

Lalage mœsta, sp. n., Timor Laut, P. L. Sclater, P. Z. S. 1883, p. 55. Figured; J. Gould, B. New Guinea, pt. xv.

Campophaga polioptera, Sharpe, = *C. neglecta*, Hume; E. W. Oates, Handb. B. Br. Burm. p. 232.

Campophaga innominata, sp. n. (= *C. vidua*, Hume, *nec* Hartl.), *id. l. c.* p. 233.

Muscicapidæ.

Hyliota. Monograph of the genus; G. Hartlaub, J. f. O. 1883, pp. 321–333. *H. barbozæ*, sp. n., Benguela, *id. l. c.* pp. 329–331. Notes on the genus; G. Lewis, P. Ac. Philad. 1883, pp. 128–130.

Pœcilodryas sylvia, sp. n., S.E. New Guinea, E. P. Ramsay, P. Linn. Soc. N. S. W. viii. p. 19 [= *P. bimaculata*, Salvad.; R. B. Sharpe, in Gould's B. New Guinea, pt. xvii.].

Pœcilodryas albifacies [Zool. Rec. xix. *Aves*, p. 25]. Nest and eggs; E. P. Ramsay, P. Linn. Soc. N. S. W. viii. pp. 25 & 26.

Micræca hemixantha, sp. n., Timor Laut, P. L. Sclater, P. Z. S. 1883, p. 55.

Gerygone dorsalis, sp. n., Tenimber Islands, *id. l. c.* p. 199.

Rhipidura hamadryas, sp. n., Larat, Timor Laut, *id. l. c.* p. 54. Figured; J. Gould, B. New Guinea, pt. xv.

Rhipidura vidua (nec Salvad.), ? sp. n., Sumatra, H. Schlegel, in Veth's "Midden Sumatra," *Aves*, pl. ii. [= *R. schlegeli*, Sharpe].

Rhipidura fusco-rufa (pl. xxvii.) and *R. opistherythra*, spp. nn., Tenimber Islands, P. L. Sclater, P. Z. S. 1883, pp. 197 & 198. The former figured; J. Gould, B. New Guinea, pt. xv.

Myiagra fulviventris, sp. n., Larat, Timor Laut, P. L. Sclater, *l. c.* p. 54.

Monarcha mundus, sp. n., Timor Laut, *id. l. c.* p. 54, pl. xii. fig. 2. [Type of *Heteranax*, g. n., R. B. Sharpe, in Gould's B. New Guinea, pt. xvi.] *M. castus*, sp. n., Loetoer, Timor Laut, *id. l. c.* p. 53, pl. xii. fig. 1.

Monarcha periophthalmicus [Zool. Rec. xix. *Aves*, p. 26] figured; J. Gould, B. New Guinea, pt. xiv.

Turdidæ.

Seebohm, H. Remarks on the Thrushes of the Ethiopian Region. Ibis, 1883, pp. 163–165.

A review of Cabanis's genus *Peliocichla* [Zool. Rec. xix. *Aves*, p. 26].

Stejneger, L. Remarks on the Systematic Arrangement of the American *Turdidæ*. P. U. S. Nat. Mus. v. pp. 449–483.

The author reviews Seebohm's recent classification of the *Turdidæ*, in the present paper proposes a new arrangement, as follows:—

Subfam. Turdinæ.

Group *Sialiæ*.

1. *Ridgwayia*, g. n.; type, *R. pinicola*, Scl.
2. *Sialia*.

Group *Saxicoleæ*.
1. *Saxicola*.
Group *Turdeæ*.
1. *Hylocichla*.
2. *Turdus*.
3. *Hesperocichla*.
Group *Luscineæ*.
1. *Catharus*.
2. *Luscinia*.
3. *Cyanecula*.
Group *Meruleæ*.
1. *Merula*.
2. *Semimerula*.
3. *Cichl[o]herminia*.
4. *Mimocichla*.

Subfam. MYADESTINÆ.

Group *Platycichleæ*.
1. *Cossyphopsis*, g. n.; type, *C. reevii*, Lawr.
2. *Platycichla*.
3. *Turdampelis*.
Group *Myadesteæ*.
1. *Myadestes* [*Myedestes*].

From the latter group is separated, as a new genus, *Entomodestes* [*Entomedestes*]; type, *E. leucotis* (Tschudi), *id. l. c.* pp. 455-457, note.

Turdus aliciæ bicknelli [Zool. Rec. xix. *Aves*, p. 26] in New England; W. Brewster, Bull. Nutt. Orn. Club. viii. pp. 12-17.

Turdus torquatus in Sicily; F. Minà-Palumbo, Nat. Sicil. pp. 175–177, and P. Doderlein, *tom. cit.* pp. 217–220.

Turdus ignobilis maculirostris, subsp. n., W. Ecuador, H. von Berlepsch & L. Taczanowski, P. Z. S. 1883, p. 538.

Merula confinis. Note on; R. Ridgway, P. U. S. Nat. Mus. vi. pp. 158 & 159.

Geocichla machiki, sp. n., Timor Laut, H. O. Forbes, P. Z. S. 1883, pp. 588 & 589, pl. lii.

Curruca atricapilla figured; H. H. Giglioli, Iconogr. Avif. Ital. fasc. xxi.

Phyllopneuste schwarzi, Rodde, and *P. fuscata*, Blyth, should be referred to *Herbivocula*; E. W. Oates, Handb. B. Br. Burm. i. pp. 91 & 92.

Phyllopneuste homeyeri, sp. n., Kamtschatka, B. Dybowski, Bull. Soc. Z. Fr. viii. pp. 358 & 359.

Phylloscopus trochilus figured; E. T. Booth, Rough Notes, pt. 4.

Phylloscopus pseudoborealis, sp. n., Pamir, W. Severtzow, Ibis, 1 p. 66 [= *P. plumbeitarsus*, teste H. Seebohm, *ibid.*].

Phylloscopus eversmanni. Notes on; M. Menzbier, Bull. Mosc. lvi... pp. 112–124.

Acrocephalus mendanæ, sp. n., Marquesas Islands, H. B. Tristram, Ibis, 1883, pp. 43 & 44, pl. i. *A. pistor*, sp. n., Fanning Islands, *id. l. c.*

pp. 44 & 45, pl. ii. *A. mariannæ*, nom. emend. for *Tartare luscinia*, Q. & G., Guam Island; *id. l. c.* pp. 45 & 46.

Acrocephalus ilensis, sp. n., Pamir, N. Severtzow, Ibis, 1883, p. 66 [= *A. dumetorum* in autumn plumage; H. Seebohm, *ibid.*].

Acrocephalus dybowskii, sp. n., Kamtschatka, R. Ridgway, P. U. S. Nat. Mus. vi. pp. 92 & 93.

Acrocephalus arundinaceus figured; H. H. Giglioli, Iconogr. Avif. Ital. fasc. xx.

Calamoherpe rehsii, sp. n., Nawado or Pleasant Island, O. Finsch, Ibis, 1883, pp. 142–144.

Saxicola œnanthe. Large and small forms figured; E. T. Booth, Rough Notes, pt. 4.

Saxicola monticola. The variations in plumage not due, as supposed by Seebohm (Cat. B. Brit. Mus. v. p. 377), to hybridisation, but the result of age, in male bird; E. A. Butler, H. W. Feilden & S. G. Reid, Ibis, 1883, pp. 331–337. Additional evidence regarding the changes mentioned by above-named authors; R. B. Sharpe, *tom. cit.* pp. 337–345.

Erithacus luscinia in Ireland; R. J. Ussher, Zool. 1883, pp. 30 & 31.

Ruticilla tithys figured; E. T. Booth, Rough Notes, pt. 4.

Ruticilla erythrogastra, Gould, = *Motacilla ochrura*, Gm.; H. Seebohm, Ibis, 1883, pp. 16 & 17.

Pycnonotidæ.

Xenocichla orientalis, sp. n., Equatorial Africa, G. Hartlaub, J. f. O. 1883, p. 425.

Mimidæ.

Harporrhynchus redivivus leconti. Its nest and eggs; G. Holterhoff, Bull. Nutt. Orn. Club, viii. pp. 48 & 49.

Cinclidæ.

Cinclus schulzi, sp. n., Tucuman, J. Cabanis, J. f. O. 1883, p. 102. Figured; pl. ii. fig. 3.

Cinclus cashmeriensis from the Caucasus; H. Seebohm, Ibis, 1883, p. 13.

Troglodytidæ.

Troglodytes sp. n. [unnamed], Bering Island and the Comandores, B. Dybowski, Bull. Soc. Z. Fr. viii. pp. 357 & 358 [= *Anorthura pallescens*, Ridgway, P. U. S. Nat Mus. vi. pp. 93 & 94].

Troglodytes furvus albicans, subsp. n., W. Ecuador, H. von Berlepsch & Taczanowski, P. Z. S. 1883, p. 540.

Microcerculus ustulatus (pl. ix. fig. 2) and *Cistothorus alticola*, spp. nn., British Guiana, O. Salvin & F. Godman, Ibis, 1883, pp. 204 & 205.

Uropsila auricularis figured; J. Cabanis, J. f. O. tav. ii. fig. 1.

Thryothorus ruficaudatus, sp. n., Venezuela, H. von Berlepsch, Ibis, 1883, pp. 491 & 492.

Myiedestidæ.

Entomodestes [*Entomedestes*], g. n.; type, *E. leucotis* (Tschudi), L. Stejneger, P. U. S. Nat. Mus. v. pp. 456 & 457.

Ptilonorhynchidæ.

Ælurædus melanocephalus, S.E. New Guinea, E. P. Ramsay, P. Linn. Soc. N. S. W. viii. p. 25.

Prionodura, g. n.; type, *P. newtoniana*, sp. n., Queensland, C. W. De Vis, P. Linn. Soc. N. S. W. vii. pp. 561 & 562.

Ptilonorrhynchus holosericeus. A long time in gaining black plumage; A. C. Le Souëf, P. Z. S. 1883, pp. 388 & 389.

Timeliidæ.

Sharpe, R. B. Catalogue of the *Passeriformes*, or Perching Birds, in the Collection of the British Museum. *Cichlomorphæ*. Part iv., containing the concluding portion of the family *Timeliidæ* (Babbling Thrushes). [Vol. vii. of the "Catalogue of Birds."] 1883, 8vo, pp. i.–xvi. & 1–700, pls. i.–xv.

The author divides the concluding volume of the Timeliine Birds into ten groups—i. *Thamnobiæ*; ii. *Bradypteri*; iii. *Eremomelæ*; iv. *Cisticolæ*; v. *Chameæ*; vi. *Henicuri*; vii. *Crateropodes*; viii. *Timeliæ*; ix. *Liotriches*; x. *Accentores*. The first, second, third, and tenth of these groups the author considers ought to have been placed by Seebohm with the *Turdidæ*, as they are apparently not true *Timeliidæ* at all.

Group Thamnobiæ.

Brachypteryx saturatus figured; F. Nicholson, Ibis, 1883, pl. x. fig. 2.

Brachypteryx umbratilis, Temm., = *Trichostoma rostratum*, Blyth; E. W. Oates, Handb. B. Br. Burm. i. p. 56, and Sharpe, Cat. B. Brit. Mus. vii.

Cossypha isabellæ is a *Callene*; R. B. Sharpe, *l. c.* p. 17.

Ruticilla moussieri is a *Pinarochroa*; id. *l. c.* p. 20.

Cossypha albicapilla is a *Cittocincla*; id. *l. c.* p. 89.

Cossypha leucosticta, sp. n., Gold Coast, *id. l. c.* p. 44, pl. i.

Saxicola shelleyi, Sharpe, and *S. arnotti*, Tristr., referred to the genus *Thamnolæa*; id. *l. c.* pp. 52 & 53.

Alethe castanonota figured; *id. l. c.* pl. ii.

Ædonopsis, g. n. Type, *Cossypha signata*, Sund.; *id. l. c.* p. 68.

Erythropygia zambesiana and *E. ruficauda* [Zool. Rec. xix. *Aves*, p. 28] figured; *id. l. c.* pl. xv. figs. 1 & 2.

Group Bradypteri.

Bebrornis, g. n. Type, *B. rodericanus*, E. Newt.; *id. l. c.* p. 102.

Bradypterus sylvaticus figured; *id. ibid.* pl. iv.

Euryptila, g. n. Type, *E. subcinnamomea*, Smith; *id. l. c.* p. 116.

Calamocichla, g. n. Type, *C. newtoni*, Hartl.; R. B. Sharpe, *l. c.* p. 131.
Calamonastes, g. n. Type, *C. fasciolatus*, Smith; *id. l. c.* p. 133.

Group Eremomelæ.

Stiphrornis erythrothorax and *S. gabonensis*, sp. n., figured; *id. ibid.* pl. vi. figs. 1 & 2.

Eminia, Hartl. [Zool. Rec. xix. *Aves*, p. 28], = *Apalis*, Swains.; *id. l. c.* p. 137.

Apalis cerviniventris figured; *id. ibid.* pl. iii.

Dryodromas albigularis, F. & H., = *D. icteropygialis*, Lafr.; *id. l. c.* p. 148.

Eremomela polioxantha, sp. n., Suazi Land, *id. l. c.* p. 160. *E. usticollis* and *E. scotops* figured; *id. ibid.* pl. v. figs. 1 & 2.

Group Cisticolæ.

Pyrrholæmus, Gould, is not distinct from *Sericornis*, Gould; *id. l. c.* p. 301.

Acanthiza magna, Gould, is a *Sericornis*; id. *l. c.* p. 308.

Sericornis beccarii and *S. arfakiana* figured; J. Gould, B. New Guinea, pt. xv.

Suya albigularis figured; F. Nicholson, Ibis, 1883, pl. x. fig. 1.

*Phyllobates**, g. n. Type, *Orthotomus coronatus*, Jerd.; E. W. Oates, Handb. B. Br. Burm. i. p. 110 (Sharpe, MSS.). Renamed *Phyllergates*; *id. l. c.* p. 229 (Sharpe, MSS.).

Prinia superciliosa, Swains., *P. affinis*, Smith, *P. melanorrhyncha*, Jerd. & Fras., *P. bivittata*, Peters, *P. murina*, Heugl., and *P. tenella*, Cab., are all *P. mystacea*, Rüpp.; *id. l. c.* pp. 191 & 192.

Prinia extensicauda, Swinh., *P. adamsi*, Jerd., *P. terricolor*, Hume, and *P. blanfordi*, Wald., are all *P. inornata*, Sykes; *id. l. c.* pp. 195 & 196.

Prinia neglecta, Jerd., *P. jerdoni*, Blyth, *P. robusta*, Blyth, *nec* Rüpp., *P. valida*, Blyth, *P. gangetica*, Blyth, *P. rufescens*, Hume, and *P. insignis*, Hume, are all stages of plumage of *P. sylvatica*, Blyth; *id. l. c.* pp. 199 & 200.

Prinia sylvatica figured; *id. l. c.* pls. vii. & viii.

Drymœca erythroptera is an *Orthotomus*; id. *l. c.* p. 238.

Hemipteryx, Swains., = *Cisticola*, Kaup.; *id. l. c.* p. 205.

Cisticola blanfordi, sp. n. [= *C. marginalis*, Hartl., *nec* Heugl.; = *C. hartlaubi*, R. B. Sharpe, *l. c.* p. 243], G. Hartlaub, Abh. Ver. Bremen, viii. p. 220.

Cisticola meridionalis, Congo, and *C. orientalis*, E. Africa, subspp. nn., *id. l. c.* p. 244 & 245.

Cisticola swanzii, Sharpe, = *C. concolor*, Heugl.; *id. l. c.* p. 248.

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* As explained by Mr. Oates, his nomenclature of the *Timeliidæ* was mainly taken from the seventh volume of the "Catalogue of Birds," which was going through the press at the same time as his "Handbook." I am, therefore, responsible for the generic name *Phyllobates*, which I afterwards found to have been preoccupied, and which I changed to *Phyllergates*.—R. B. S.

Melocichla pyrrhops, Cab., = *C. erythrops*, Hartl.; Hartlaub, *l. c.* p. 258.

Cisticola brachyptera, Sharpe, and *C. hypoxantha*, Hartl., = *C. rufa*, Fras.; *id. l. c.* p. 252.

Cisticola lineicapilla, Gould, *C. ruficeps*, Gould, *C. isura*, Gould, *C. erythrocephala*, Blyth, *C. volitans*, Swinh., *C. tytleri*, Jerd., *C. rustica*, Wall., *C. semirufa*, Cab., *C. delicatula*, Blyth, *C. melanocephala*, Anderson, *C. ruficollis*, Wald., and *C. grayi*, Wald., are all stages of plumage of *C. exilis*, Vig. & Horsf.; *id. l. c.* pp. 270 & 271.

Cisticola fortirostris, Jerd. & Fras., *C. valida*, Heugl., and *C. pachyrrhyncha*, Heugl., are all stages of plumage of *C. strangii*, Fras.; *id. l. c.* pp. 276 & 277.

Cisticola curvirostris, Sund., is the summer plumage of *C. natalensis*, Smith; *id. l. c.* p. 279.

Cisticola fulvifrons, Sund., *C. nævia*, Hartl, *C. isodactyla*, Peters, *C. hæmatocephala*, Cab., *C. stulta*, F. & H., and *C. amphilecta*, Reichen., are all stages of plumage of *C. lugubris*, Rüpp.; *id. l. c.* p. 280.

Cisticola leucopygia, Heugl., = *C. ruficeps*, Cretzschm.; *id. l. c.* p. 282.

Cisticola chiniana, Smith, *C. procera*, Peters, *C. lais*, F. & H., *C. rufilata*, Hartl., and *C. holubi*, Petz., are stages of plumage of *C. subruficapilla*, Smith; *id. l. c.* pp. 283 & 284.

Group Henicuri.

Hydrocichla, g. n. Type, *Henicurus ruficapillus*, Temm.; Hartlaub, *l. c.* p. 319.

Microcichla, g. n. Type, *Henicurus scouleri*, Vig.; *id. l. c.* p. 322.

Group Crateropodes.

Eupetes castanonotus figured; J. Gould, B. New Guinea, pt. xiv.

Eupetes [*Cinclosoma*] *ajax*. Egg described; E. P. Ramsay, P. Linn. Soc. N. S. W. viii. p. 26.

Trochalopterum jerdoni, Blyth, figured; R. B. Sharpe, Cat. B. Brit. Mus. vii. p. 373, pl. x.

Argya hyperythra, sp. n., Madras, *id. l. c.* p. 390.

Pinarornis plumosus figured; *id. l. c.* pl. ix.

Pomatorrhinus pinwilli, subsp. n., N.W. Himalayas, *id. l. c.* p. 413.

Garrulax mouhoti, sp. n., Cambodia, *id. l. c.* p. 444.

Stactocichla, g. n. Type, *Garrulax merulinus*, Blyth; *id. l. c.* p. 449.

Melanocichla, g. n. Type, *Ianthocichla lugubris*, S. Müll.; *id. l. c.* p. 451.

Rhinocichla, g. n. Type, *Timalia mitrata*, S. Müll.; *id. l. c.* p. 452.

Dryonastes, g. n. Type, *Ianthocincla ruficollis*, J. & S.; *id. l. c.* p. 454.

Malacocercus, Swains., is not distinct from *Crateropus*, Swains.; *id. l. c.* p. 469.

Crateropus haynesi figured; *id. l. c.* pl. xi.

Æthocichla gymnogenys figured; *id. l. c.* pl. xii.

Argya amauroura, sp. n., Equatorial Africa, A. von Pelzeln, Verh. z.-b. Wien, xxxii. pp. 503 & 504.

Crateropus tenebrosus, sp. n., E. Equatorial Africa, G. Hartlaub, J. f. O. 1883, p. 425.

Drymaœdus pallidus, sp. n., W. Australia, R. B. Sharpe, Cat. B. Brit. Mus. vii. p. 344.

Drymaœdus beccarii figured; J. Gould, B. New Guinea, pt. xv.

Group Timeliæ.

Ptyrticus turdinus, g. & sp. nn., E. Equatorial Africa, G. Hartlaub, J. f. O. 1883, p. 425.

Suthora humii, sp. n., E. Himalayas, R. B. Sharpe, *l. c.* p. 487.

Pellorneum intermedium, sp. n., Burma, *id. l. c.* p. 519, pl. xiii. fig. 1.

Scotocichla, g. n. Type, *Drymocataphus fuscicapillus*, Blyth; *id. l. c.* p. 523.

Acrocephalus mendanæ [vide *suprà*], *A. pictor* [vide *suprà*], *A. syrinx*, Kittl., and *A. rehsii* [vide *suprà*], are all members of the genus *Tatare*, which is closely allied to *Acrocephalus*; id. *l. c.* pp. 524–528.

Turdinus gularis, Sharpe, figured; *id. l. c.* pl. xiv.

Erythrocichla, g. n. Type, *Brachypteryx bicolor*, Less.; *id. l. c.* p. 551.

Ptilopyga, g. n. Type, *Malacocincla rufiventris*, Salvad.; *id. l. c.* p. 585.

Anuropsis, g. n. Type, *Brachypteryx malaccensis*, Hartl.; *id. l. c.* p. 588.

Crateroscelis, g. n. Type, *Myiothera murina*, Temm.; *id. l. c.* p. 590.

Corythocichla, g. n. Type, *Turdinus brevicaudatus*, Blyth; *id. l. c.* p. 592.

Drymocataphus assamensis, sp. n., Assam, *id. l. c.* p. 557.

Pellorneum ignotum, Hume, *P. tickelli*, Blyth, and *Trichostoma rubiginosum*, Wald., are all members of the genus *Drymocataphus*; id. *l. c.* pp. 556, 557, & 560.

Malacopterum erythrote, sp. n., Borneo, *id. l. c.* p. 567, pl. xiii. fig. 2.

Cyanoderma, Salvad., = *Mixornis*, Hodgs.; *id. l. c.* p. 575.

Gypsophila, g. n. Type, *Turdinus crispifrons*, Blyth; E. W. Oates, Handb. B. Br. Burm. i. p. 61.

Stachyridopsis, g. n. Type, *S. pyrrhops*, Hodgs.: R. B. Sharpe, *l. c.* p. 597.

Minla brunneicauda, sp. n., Khasia Hills, *id. l. c.* p. 609.

Accentoridæ.

Accentor orientalis, Persia, *A. fervidus*, and *A. rufilatus* (Severtzow, MSS.), Turkistan, subspp. nn., R. B. Sharpe, *l. c.* pp. 652, 653, & 664.

Paridæ.

[See Gadow, H.]

Dubois, A. Remarques sur les Mésanges du genre *Acredula*. Bull. Soc. Z Fr. viii. pp. 437–444.

A review of the Long-tailed Titmice, which, however, does not add much to the information already published.

Ægithalus capensis (fig. 2) and *Æ. caroli* (fig. 1) figured; H. Gadow, Cat. B. Brit. Mus. viii. pl. i.

Ægithalus pendulinus figured; H. H. Giglioli, Iconogr. Avif. Ital. fasc. xxi.

Ægithalus calotropiphilus, sp. n., Senegambia, A. T. de Rochebrune, Bull. Soc. Philom. (7) vii. p. 166.

Pœcilia macroura[*-rura*], sp. n., Kamtschatka [*P. borealis*, Tacz., *olim*], L. Taczanowski, Bull. Soc. Z. Fr. viii. p. 346.

Lophophanes cristatus figured; H. H. Giglioli, Iconogr. Avif. Ital. fasc. xx.

Lophophanes inornatus cineraceus, subsp. n., Lower California, R. Ridgway, P. U. S. Nat. Mus. vi. pp. 154 & 155.

Psaltriparus grindæ, sp. n., Lower California, *id. l. c.* p. 155.

Panurus biarmicus figured; H. H. Giglioli, Iconogr. Avif. Ital. fasc. xx.

Laniidæ.

[See Gadow, H.]

Streets, P. H. A Study of the Immature Plumage of the North American Shrikes, to show their Descent from a Common Ancestor. Am. Nat. xvii. pp. 389–391.

Cracticus rufescens, sp. n., Queensland, C. W. De Vis, P. Linn. Soc. N. S. W. vii. pp. 562 & 563.

Lanius major in Scotland; H. Seebohm, P. Phys. Soc. Edinb. vii. pp. 223 & 224.

Lanius rapax and *L. major* in Russia; M. Menzbier, Bull. Mosc. lviii. pp. 124–129.

Lanius seebohmi, sp. n., Amoor Land, H. Gadow, Cat. B. Brit. Mus. viii. p. 243. *L. fallax* figured; *id. ibid.* pl. viii. *L. dealbatus* figured; *id. ibid.* pl. vi. *L. elegans* figured; *id. l. c.* p. 251.

Lanius pomeranus. Earliest name for Woodchat Shrike; Howard Saunders, Ibis, 1883, pp. 83–85. [See Newton, A.; Seebohm, H.]

Lanus cristatus, juv., figured; W. E. Nelson, Cruise R. S. 'Corwin,' pl. iii.

Lanius pyrrhostictus [Zool. Rec. xix. *Aves*, p. 30] in Equatorial Africa; A. von Pelzeln, Verh. z.-b. Wien, xxxii. p. 505.

Clytorhynchus, Elliot, = *Xenopirostris*, Bp.; H. Gadow, Cat. B. Brit. Mus. viii. p. 109.

Telephonus ussheri [Zool. Rec. xix. *Aves*, p. 30] and *T. blanfordi* [*l. c.* p. 30] figured; *id. ibid.* pl. ii. figs. 1 & 2.

Telephonus anchietæ, Bocage, is not distinct from *T. minutus*, Hartl.; J. V. Barboza du Bocage, J. Sci. Lisb. xxxiv. pp. 73 & 74. The two species considered to be distinct; H. Gadow, Cat. B. Brit. Mus. viii. p. 128.

Laniarius poliochlamys, sp. n., Gold Coast, *id. l. c.* p. 155, pl. iii.

Laniarius melanothorax figured; *id. ibid.* pl. iv.

Nilaus capensis (fig. 1) and *N. afer* (fig. 2); *id. ibid.* pl. v.

Nilaus edwardsi, sp. n., Senegambia, A. T. de Rochebrune, Bull. Soc. Philom. (7) vii. p. 166.

Pachycephala arctitorquis, sp. n., Larat, Timor Laut, P. L. Sclater, P. Z. S. 1883, p. 55, pl. xiii.

Pachycephala fusco-flava, sp. n., Larat, Tenimber Islands, *id. l. c.* p. 198,

pl. xxviii. The adult male described and figured; H. O. Forbes, P. Z. S. 1883, pp. 589, pl. liii.

Pachycephala brunnea and *P. hyperythra* figured; J. Gould, B. New Guinea, pt. xiv.

Pachycephala macrorrhyncha, *P. clio*, and *P. obiensis*, are synonyms of *P. melanura*, Gray; H. Gadow, Cat. B. Brit. Mus. viii. pp. 185–188.

Pachycephala xanthetræa, Forst., should be called *P. xantherythræa*; id. *l. c.* p. 207.

Muscitrea cyanea is a *Pachycephala*; id. *l. c.* p. 224. Is a *Niltava* [*Muscicapidæ*]; E. W. Oates, Handb. B. Br. Burm. p. 298.

Pachycephala poliosoma [Zool. Rec. xix. *Aves*, p. 30] figured; Gadow, *l. c.* pl. ix. *P. fortis*, sp n., S.E. New Guinea, *id. l. c.* p. 369.

Vireonidæ.

[See Gadow, H.]

Vireo flaviviridis in Canada; C. Hart Merriam, Bull. Nutt. Orn. Club, viii. p. 213.

Vireosylvia chivi griseo-barbata, subsp. n., and *Hylophilus minor*, sp. n., W. Ecuador, H. von Berlepsch & L. Taczanowski, P. Z. S. 1883, pp. 541 & 542.

Hylophilus sclateri, sp. n., British Guiana, O. Salvin & F. D. Godman, Ibis, 1883, p. 205.

Certhiidæ.

[See Gadow, H.]

Sittella albifrons, sp. n., S.E. New Guinea, E. P. Ramsay, P. Linn. Soc. N. S. W. viii. p. 24.

Hylypsornis, Bocage, = *Salpornis*, Gray; H. Gadow, Cat. B. Brit. Mus. viii. p. 329.

Nectariniidæ.

Gadow, H. On the Suctorial Apparatus of the Tenuirostres. P. Z. S. 1883, pp. 62–69, pl. xvi.

Describes the anatomy of the muscles which work the tongue in the Sun-birds and Honey-suckers, with a comparison of the same mechanism in the Humming-birds.

Cinnyris erikssoni [Zool. Rec. xix. *Aves*, p. 31] = *C. ludovicensis*, Bocage; J. V. Barboza du Bocage, J. Sci. Lisb. xxxiv. pp. 105 & 106.

Arachnothera concolor (? sp. n.), Sumatra, H. Schlegel, in Veth's "Midden Sumatra," *Aves*, pl. i.

Meliphagidæ.

For Anatomy, see Gadow, H.

Ptilotis marmorata [Zool. Rec. xix. *Aves*, p. 32] figured; J. Gould, B. New Guinea, pt. xiv.

Melilestes polioptera [Zool. Rec. xix. *Aves*, p. 31] figured; *id. ibid.*

Myzomela annabellæ, sp. n., Loetoer, Timor Laut, P. L. Sclater, P. Z. S. 1883, p. 56. Figured ; J. Gould, B. New Guinea, pt. xv.

Myzomela wakoloensis, sp. n., Bourou, H. O. Forbes, P. Z. S. 1883, pp. 115 & 116.

Zosterops griseiventris, sp. n., Tenimber Islands, P. L. Sclater, P. Z. S. 1883, p. 199.

Zosterops delicatula [Zool. Rec. xix. *Aves*, p. 31] figured ; J. Gould, B. New Guinea, pt. xiv.

Dicеidæ.

Sharpe, R. B. Notes on some species of Birds of the Family *Dicеidæ*. P. Z. S. 1883, pp. 578–580.

Dicæum schistaceum, Tweedd., = *D. rubriventer*, Less., juv. ; *D. olivaceum*, Wald., = *D. inornatum*, Hodgs. ; *D. modestum*, Tweedd., = *D. everetti*, Tweedd. ; *D. sulaense* [*-nense*, *sulanum*, vel *sularum*], Sula Islands, *D. pulchrius*, S.E. New Guinea, and *D. tristrami*, Solomon Islands, spp. nn.

Dicæum fulgidum, sp. n., Timor Laut, P. L. Sclater, P. Z. S. 1883, p. 56. Figured ; J. Gould, B. New Guinea, pt. xv.

Dicæum flammeum. Its anatomy ; W. Blasius, JB. Ver. Braunschw. iii. pp. 79–81.

Hirundinidæ.

Seebohm, H. Notes on *Hirundo rufula* and its allies, with description of a supposed new subspecies. Ibis, 1883, pp. 167–169.

A review of the subgenus *Lillia*, with a key to the species. 2 new subspecies are described, *H. rufula* β *scullii*, Nepal, and *H. striolata* β *substriolata*, Formosa.

Hirundo kamtschatica, sp. n., Kamtschatka, B. Dybowski, Bull. Soc. Z. Fr. viii. pp. 356 & 357 [= *H. saturata* ; Ridgway, P. U. S. Nat. Mus. vi. p. 95 (= *Hirundo tytleri*, Jerd.)].

Hirundo poucheti, sp. n., Congo, L. Petit, Bull. Soc. Z. Fr. viii. p. xliii. [= *H. melbina*, Verr.].

Atticora pileata and *Tachycineta albilinea* figured ; O. Salvin & F. D. Godman, Biol. Centr. Am. Aves, pl. xv. figs. 1 & 2.

Motacillidæ.

Seebohm, H. Observations on the Pied Wagtails of Japan. Ibis, 1883, pp. 90–92.

A review of the Pied Wagtails of Asia, with a key to the species in summer plumage. *M. blakistoni*, sp. n., Japan.

Motacilla ocularis, Swinh., and *M. amurensis*, Seeb., are identical ; R. Ridgway, P. U. S. Nat. Mus. vi, pp. 144–147. The former figured ; W. E. Nelson, Cruise R. S. 'Corwin,' Birds, pl. ii.

Motacilla flava, ♂ & ♀ adult, *M. rayi*, juv., and *Anthus obscurus* (Scandinavian form), figured ; E. T. Booth, Rough Notes, pt. 4.

Budytes melanocervix, sp. n., Altai, E. F. von Homeyer, MT. orn. Ver. Wien, 1883, p. 86.

Anthus cervinus in Lower California; R. Ridgway, P. U. S. Nat. Mus. xi. pp. 156 & 157.

Anthus campestris near Brighton; T. Parkin, Zool. 1883, p. 34.

Anthus steinegeri, sp. n., Commander Islands, R. Ridgway, P. U. S. Nat. Mus. vi. pp. 95 & 96.

Anthus micror[r]hynchus, sp. n., Pamir, N. Severtzow, Ibis, 1883, p. 63 [= *A. arboreus*, teste Seebohm, *ibid.*].

Ampelidæ.

Ampelis garrulus figured; H. H. Giglioli, Iconogr. Avif. Ital. fasc. xx.

Phainoptila melanoxantha figured; O. Salvin & F. D. Godman, Biol. Centr. Am. Aves, pl. xiv.

Mniotiltidæ.

Grundtvig, F. L. The vernal migration of Warblers on Wolf River, Ontagamic County, Wisconsin. Bull. Nutt. Orn. Club, viii. pp. 66–72.

Myiodioctes meridionalis, sp. n., Ecuador, A. von Pelzeln, Verh. z.-b. Wien, xxxii. p. 446.

Geothlypis trichas occidentalis, var. n., Nevada, W. Brewster, Bull. Nutt. Orn. Club. viii. p. 159.

Geothlypis auricularis, sp. n., Peru, O. Salvin, P. Z. S. 1883, p. 420.

Basileuterus fraseri, sp. n., W. Ecuador, P. L. Sclater, P. Z. S. 1883, p. 653, pl. lxi.

Dendræca adelaidæ delicata, subsp. n., Island of Santa Lucia, R. Ridgway, P. U. S. Nat. Mus. v. pp. 525 & 526.

Icteridæ.

Sclater, P. L. Review of the Species of the Family *Icteridæ*. Pt. i., *Cassicinæ*. Ibis, 1883, pp. 145–163, pls. vi. & vii.

6 genera recognized: *Clypeicterus* and *Ocyalus*, each with 1 species; *Eucorystes*, g. n., type *E. wagleri*, Gray & Mitch.; *Ostinops*, with 12 species, of which 2 are new, *O. salmoni*, Antioquia (pl. vi.), and *O. oleaginus*, Venezuela? (pl. vii.); *Cassiculus*, with 1 species; *Cassicus*, with 11 species.

Cœrebidæ.

Certhiola caboti figured; O. Salvin & F. D. Godman, Biol. Centr. Am. Aves, tab. xv.A, fig. 4.

Diglossa plumbea, ♂ & ♀ figured; *iid. l. c.* tab. xv.A, figs. 1 & 2.

Dacnis viguieri, sp. n., Panama, E. Oustalet, in O. Salvin & F. D. Godman's Biol. Centr. Am. Aves, p. 246, pl. xv.A, fig. 3.

Chlorophanes spiza exsul, subsp. n., W. Ecuador, H. von Berlepsch & L. Taczanowski, P. Z. S. 1883, p. 543.

Tanagridæ.

Euphonia hypoxantha, sp. n., W. Ecuador, H. von Berlepsch & L. Taczanowski, P. Z. S. 1883, p. 544.

Euphonia gracilis (fig. 3), *E. luteicapilla* (fig. 1), and *E. fulvicrissa* (fig. 2) figured; O. Salvin & F. D. Godman, Biol. Centr. Am. Aves, pl. xvi.

Calliste cyanopygia, sp. n., W. Ecuador, H. von Berlepsch & L. Taczanowski, P. Z. S. 1883, p. 545; P. L. Sclater, P. Z. S. 1883, p. 653.

Carenochrous seebohmi and *C. dresseri*, spp. nn., Peru, L. Taczanowski, P. Z. S. 1883, p. 70.

Tanagra palmarum violilavata, subsp. n., W. Ecuador, H. von Berlepsch & L. Taczanowski, P. Z. S. 1883, p. 546.

Buarrhemon (*Atlapetes*) *citrinellus*, sp. n., Tucuman, J. Cabanis, J. f. O. 1883, p. 109, pl. i. fig. 2.

Pyranga hæmalea, sp. n., British Guiana, O. Salvin & F. D. Godman, Ibis, 1883, pp. 205 & 206.

Phænicothraupis stolzmanni, sp. n., W. Ecuador, H. von Berlepsch & L. Taczanowski, P. Z. S. 1883, pp. 546 & 547; *P. salvini*, sp. n., Central America, H. von Berlepsch, Ibis, 1883, pp. 487–490.

Fringillidæ.

Loxia curvirostra, ♂ ad. & juv. figured; E. T. Booth, Rough Notes, pt. 4.

Loxia rubrifasciata near Moscow; M. Menzbier, Bull. Mosc. lviii. pp. 109 & 110.

Loxia leucoptera. Its immature plumage; N. C. Brown, Bull. Nutt. Orn. Club, viii. pp. 47 & 48.

Pinicola enucleator in Cambridgeshire; R. M. Christie, Zool. 1883, p. 222.

Pyrrhula coccinea var. *atavica* near Moscow; M. Menzbier, Bull. Mosc. lviii. p. 111 & 112.

Leucosticte pamirensis, sp. n., Pamir, N. Severtzow, Ibis, 1883, pp. 58–60.

Phrygilus dorsalis, sp. n., Tucuman, J. Cabanis, J. f. O. 1883, p. 109.

Orospina pratensis, g. & sp. nn., Tucuman, *id. l. c.* pp. 108 & 109, Figured; pl. i. fig. 1.

Sycalis intermedia, sp. n., Tucuman, *id. l. c.* p. 216.

Chrysomitris semiradzii, sp. n., W. Ecuador, H. von Berlepsch & L. Taczanowski, P. Z. S. 1883, pp. 551 & 552, pl. i.

Acanthis linaria and its allies in Bosnia; M. Menzbier, Bull. Mosc. lviii. pp. 110 & 111.

Acanthis intermedius and *A. innominatus*, spp. nn., Kamtschatka, B. Dybowski, Bull. Soc. Z. Fr. viii. pp. 364–366.

Ægiothus linaria hælbælli in New England; W. Brewster, Bull. Nutt. Orn. Club, viii. pp. 95–99.

Linota sibirica, sp. n., Altai, Homeyer, MT. orn. Ver. Wien. 1883, p. 89.

Passer montanus. Distribution in Scotland; J. J. Dalgleish, P. R. Soc. Edinb. vii. pp. 196–202.

Passer italiæ figured; H. H. Giglioli, Iconogr. Avif. Ital. fasc. xx.

Spermophila gutturalis olivacea, subsp. n., W. Ecuador, H. von Berlepsch & L. Taczanowski, P. Z. S. 1883, p. 550.

Spermophila palustris, sp. n., Uruguay, W. B. Barrows, Bull. Nutt. Orn. Club, viii. pp. 92–94.

Spermophila parva, sp. n., Mexico, G. N. Lawrence, Ann. N. York. Ac. ii. pp. 382 & 383.

Poospiza whitii, sp. n., Cordova, Argentine Republic, P. L. Sclater, P. Z. S. 1883, p. 43, pl. ix.

Ploceidæ.

Hyphantornis atrigularis (Heugl.) and allies; G. E. Shelley, Ibis, 1883, pp. 550 & 551.

Sharpia angolensis distinct from *S. ayresi*; their heads figured: J. V. Barboza du Bocage, J. Sci. Lisb. xxxiv. pp. 74 & 75.

Urobrachya mechowi [Zool. Rec. xix. *Aves*, p. 34] = *U. bocagii*, Sharpe; *id. l. c.* pp. 75–77.

Penthetria hartlaubi, sp. n., Lado, J. Cabanis, J. f. O. 1883, p. 218.

Hypochera purpurascens, sp. n., Somali Land, A. Reichenow, J. f. O. 1883, p. 221.

Lagonosticta. On the West African species of the genus; G. E. Shelley, Ibis, 1883, pp. 553–555.

Astrelda nonnula, sp. n., E. Equatorial Africa, G. Hartlaub, J. f. O. 1883, pp. 425 & 426.

Habropyga cinerea interbreeding with *H. melpoda*; F. Morawitz, Mél. biol. xi. pp. 529–539.

Munia grandis [Zool. Rec. xix. *Aves*, p. 34] figured; J. Gould, B. New Guinea, pt. xiv.

Emberizidæ.

Passerculus caboti = *Meliopiza palustris*, juv.; E. Coues, Bull. Nutt. Orn. Club, viii. p. 58.

Passerculus rostratus and its allies; R. Ridgway, P. U. S. Nat. Mus. v. pp. 537–539.

Zonotrichia albicollis. Its plumages; N. C. Brown, Bull. Nutt. Orn. Club, viii. pp. 46 & 47. Interbreeding with *Junco hiemalis*; C. H. Townsend, *tom. cit.* pp. 78–80.

Junco bairdi, sp. n., Lower California, R. Ridgway, P. U. S. Nat. Mus. vi. pp. 155 & 156.

Emberiza rustica near London; Lord Lilford, Zool. 1883, p. 33.

Fringillaria major and *F. cabanisi*. Remarks on; J. V. Barboza du Bocage, J. Sci. Lisb. xxxiv. pp. 77–79.

Alaudidæ.

Calandrella brachydactyla near Cambridge; J. E. Harting, Zool. 1883, p. 33.

Alauda cristata breeding in England; *id. l. c.* p. 178.

Sturnidæ.

Calornis crassa, sp. n., Tenimber Islands, P. L. Sclater, P. Z. S, 1883, p. 56, pl. xiv. Figured; J. Gould, B. New Guinea, pt. xv.

Pastor roseus. Habits; C. W. Wilson, Ibis, 1883, pp. 575–577.

Sturnoides minor, sp. n., S. Christoval, Solomon Islands, E. P. Ramsay, P. Linn. Soc. N. S. W. vii. pp. 726 & 727.

Oxyrrhamphidæ.

Oxyrrhamphus hypoglaucus, sp. n., British Guiana, O. Salvin & F. D. Godman, Ibis, 1883, p. 206.

Tyrannidæ.

Tyranniscus acer, sp. n., British Guiana; *iid. l. c.* pp. 206 & 207.

Leptopogon superciliaris transandinus, subsp. n., W. Ecuador, H. von Berlepsch & L. Taczanowski, P. Z. S. 1883, p. 553.

Myiarchus pelzelni, sp. n., Bahia, H. von Berlepsch, Ibis, 1883, pp. 139–141.

Myiarchus phæonotus, sp. n., British Guiana, O. Salvin & F. D. Godman, Ibis, 1883, pp. 207 & 208.

Lophotriccus, g. n. Type, *L. squamicristatus*, Lafr.; H. von Berlepsch, P. Z. S. 1883, p. 553.

Ornithion sclateri, sp. n., W. Ecuador, *id.* & L. Taczanowski, *tom. cit.* pp. 554 & 555.

Elainea ferrugineiceps, sp. n., Ecuador, E. von Pelzeln, Verh. z.-b. Wien, xxxii. p. 447.

Elainea taczanowskii, sp. n., Bahia, H. von Berlepsch, Ibis, 1883, pp. 137–139.

Myiobius voraimæ, sp. n., British Guiana, O. Salvin & F. D. Godman, *l. c.* p. 207.

Ochthœca jelskii, sp. n., Peru, L. Taczanowski, P. Z. S. 1883, p. 71.

Contopus brachyr[r]hynchus, *Myiarchus ferocior*, *M. atriceps*, *Elainea strepera*, and *E. grata*, spp. nn., Tucuman, J. Cabanis, J. f. O. 1883, pp. 214–216.

Contopus frazari, *Sayornis dominicensis*, and *Myiarchus ruficaudatus*, spp. nn., Santo Domingo, C. B. Cory, Bull. Nutt. Orn. Club, viii. pp. 94 & 95.

Cnipodectes minor, sp. n., E. Peru, P. L. Sclater, P. Z. S. 1883, p. 654.

Rhyncocyclus peruvianus subsp. *aquatorialis*, W. Ecuador, H. von Berlepsch & L. Taczanowski, *l. c.* p. 556.

Ochthodiæta lugubris, sp. n., Venezuela, H. von Berlepsch, Ibis, 1883, p. 492.

Pipridæ.

Pipra velutina, sp. n., Panama, *id. l. c.* pp. 492 & 493.

Tyranneutes brachyurus, Scl. & Salv., = *Pipra virescens*, Pelz.; O. Salvin & F. D. Godman, *l. c.* p. 208.

Cotingidæ.

Pachyrrhamphus griseigularis, sp. n., British Guiana, Salvin & Godman, *l. c.* pp. 208 & 209.

Attila spodiostethus, sp. n., British Guiana, *iid. l. c.* pp. 209 & 210.

Phytotomidæ.

Phytotoma raimondii, sp. n,, Peru, L. Taczanowski, P. Z. S. 1883, p. 71, pl. xvii.

Dendrocolaptidæ.

Upucerthia pallida, sp. n., Peru, Taczanowski, *ibid.*

Synallaxis superciliosa, sp. n., Tucuman, J. Cabanis, J. f. O. 1883, p. 110.

Dendrocolaptes plagosus and *Dendrornis polysticta*, spp. nn., British Guiana, O. Salvin & F. D. Godman, Ibis, 1883, pp. 210 & 211.

Dendrocolaptes intermedius, sp. n., Bahia, H. von Berlepsch, *l. c.* pp. 141 & 142.

Thripophaga sclateri, sp. n., S. Brazil, *id. l. c.* pp. 490 & 491, pl. xiii.

Anabazenops oleaginus, sp. n., Argentine Republic, P. L. Sclater, P. Z. S. 1883, p. 654.

Automolus rubidus, sp. n., Brazil ?, *id. l. c.* p. 654.

Automolus assimilis, sp. n., W. Ecuador, H. von Berlepsch & L. Taczanowski, P. Z. S. 1883, p. 561.

Dendrornis erythropygia æquatorialis, subsp. n., W. Ecuador, *iid. l. c.* p. 563.

Phacellodromus sincipitalis and *P. maculipectus*, spp. nn., Tucuman, J. Cabanis, J. f. O. 1883, pp. 109 & 110.

Formicariidæ.

Sclater, P. L. On the Genera *Microbates* and *Rhamphocænus* of the family *Formicariidæ*. Ibis, 1883, pp. 92-96, pl. iii.

Microbates is only a subgenus of *Rhamphocænus*, and *R. torquatus* = *R. collaris*, Pelz. ; figured, pl. iii. *R. albiventris*, sp. n., Guiana, Venezuela and Amazonia, p. 95.

Dysithamnus spodionotus, sp. n., British Guiana, O. Salvin & F. D. Godman, Ibis, 1883, p. 211.

Formicivora griseigula, sp. n., British Guiana, G. N. Lawrence, Ann. N. York Ac. ii. p. 382.

Pteroptochidæ.

Scytalopus superciliaris, sp. n., Tucuman, J. Cabanis, J. f. O. 1883, pp. 105 & 106, pl. ii. fig. 2.

Sub-Order FISSIROSTRES.

Meropidæ.

Merops phillipinus from Northumberland ; H. E. Dresser, P. Z. S. 1883, p. 1.

Caprimulgidæ.

Eurostopodus astrolabæ and *Ægotheles plumifera*, spp. nn., S.E. New Guinea, E. P. Ramsay, P. Linn. Soc. N. S. W. viii. pp. 20 & 21.

Caprimulgus macrurus. Its egg ; *id. l. c.* p. 28.

Caprimulgus ægyptius in Nottinghamshire ; J. Whitaker, Zool. 1883, pp. 374 & 375.

MACROCHIRES.

Trochilidæ.

D'Hamonville, L. Nouveautés Ornithologiques. Bull. Soc. Z. Fr. viii. pp. 76–80.

The so-called "novelties" consist of the description of a new genus, *Xanthogenys* (type, *X. salvini*) (= *Heliodoxa xanthogenys*, Salv.), and of *Campylopterus phainopeplus* and *Oxypogon cyanolæma*, both of which are redescribed without any apparent object, the confusion becoming greater through the wrong quotation of the original description in each instance.

Gouldia conversi æquatorialis, subsp. n., W. Ecuador, H. von Berlepsch & L. Taczanowski, P. Z. S. 1883, pp. 567 & 568.

Cynanthus griseiventris, sp. n., Peru, L. Taczanowski, *l. c.* p. 72.

Leucippus viridicauda, sp. n., Huiro, S. Peru, H. von Berlepsch, Ibis, 1883, pp. 493 & 494.

Cypselidæ.

Chætura sclateri occidentalis, subsp. n., N.W. Ecuador, H. von Berlepsch & L. Taczanowski, *l. c.* p. 569.

Chætura boehmi, sp. n., Kakoma, E. Africa, H. Schalow, J. f. O. 1883, p. 104.

Rhaphidura, g. n. Type, *Acanthylis leucopygialis*, Blyth ; E. W. Oates, Handb. B. Br. Burm. ii. p. 6.

Collocalia fuciphaga. Skeleton figured; A. B. Meyer, Abbild. Vogelsk. taf. xlvi. fig. 2.

Collocalia marginata, sp. n., Cebu, T. Salvadori, Atti Acc. Tor. xvii. pp. 448–450. [*C. marginata*, J. Kutter, J. f. O. 1882, p. 448, is identical.]

PICIFORMES.

Alcedinidæ.

Alcedo ispida. Its food; Th. Liebe, J. f. O. 1883, pp. 286–291.

Cyanaleyon elizabeth, sp. n., New Guinea, F. Heine, J. f. O. 1883, pp. 222 & 223.

Clytoceyx rex described and figured; E. Oustalet, La Nature, 1883, pp. 160–163.

Picidæ.

Hargitt, E. Notes on Woodpeckers. No. iii. Descriptions of two new species of Woodpeckers. Ibis, 1883, pp. 172 & 173.

Picus danfordi, sp. n., Asia Minor; *Dendropicus xantholophus*, sp. n., Gaboon.

——. Notes on Woodpeckers. No. iv. On the Woodpeckers of the Ethiopian Region. *L. c.* pp. 401–487, pl. xii.

A complete monograph of the African Woodpeckers, 5 genera and 37 species being recognized. The whole paper bears evidence of great care in its preparation, and the author is evidently thoroughly master of his subject.

Picus maior kamtschaticus, sp. n., Kamtschatka, B. Dybowski, Bull. Soc. Z. Fr[illegible]i. p. 368.

Picus japonicus, sp. n., Japan, H. Seebohm, Ibis, 1883, p. 24.

Picus major and allies. Notes on; *id. l. c.* pp. 23–25.

Picus villosus. Its habits; A. G. van Aken, Am. Nat. xvi. [1882] pp. 511–515 [*cf.* T. J. Burrill, *tom. cit.* p. 673].

Gecinus karelini, Brandt, and *G. saundersi*, are not distinguishable from *G. viridis*; H. Seebohm, Ibis, 1883, pp. 22 & 23.

Picus viridis with sickle-shaped bill; R. Besta, Atti Soc. Ital. xxvi. pp. 122–124.

Dendropicus gabonensis and *D. lugubris* figured; E. Hargitt, *l. c.* pl. xii. figs. 1 & 2.

Colaptes longirostris, sp. n., Tucuman, J. Cabanis, J. f. O. 1883, pp. 97 & 98.

Phlœotomus schulzi, sp. n., Tucuman, *id. l. c.* pp. 102 & 103.

Chloronerpes tucumanus, sp. n., Tucuman, *id. l. c.* p. 103.

Chloronerpes (Campias) frontalis, sp. n., Tucuman, *id. l. c.* p. 110.

ZYGODACTYLI.

Cuculidæ.

[See Audebert, J.]

Rhamphomantis rollesi, sp. n., S.E. New Guinea, E. P. Ramsay, P. Linn. Soc. N. S. W. viii. p. 24.

Cuculus canorus. Nesting habits; E. Bidwell, Zool. 1883, pp. 372 & 373

MUSOPHAGIDÆ.

Corythaix cabanisi, sp. n., Bagamoyo, A. Reichenow, J. f. O. 1883, p. 221.

PSITTACI.

[See GADEAU DE KERVILLE & AUDEBERT, J.]

GREENE, W. T. Parrots in Captivity. Parts 1–6. London: 1883, 8vo.

A well-written popular book, with coloured figures.

REICHENOW, A. Vogelbilden aus fernen Zonen. Abbildungen und Beschreibungen der Papageien. Cassel: 1883, Lief. xi., folio, pls. 31–33 & xxxiii.

Completes the work, which now forms an excellent popular monograph of Parrots, the execution of the plates, which are by the well-known artist Mutzel, being exceedingly good.

MEYER, A. B. Uber dei Färbung der Nestjungen von *Eclectus*, Wagl. Beitr. wiss. Zool. xxxvii. [1882] pp. 146–162.

The author appears to prove finally that the young ones of *Eclectus* ar coloured from the nest, according to the sex, green (males) and red (females), and treats the question from the standpoint of the Darwinian theory. Seventy-one different papers on the *Eclectus* question (1874–1882) are enumerated.

Eclectus riedeli figured; P. L. Sclater, P. Z. S. 1883, pl. xxvi.

Microglossus aterrimus (pl. xliii.), *Eclectus polychlorus* (pl. xliv.), *Tanygnathus muelleri* (pl. xlv.), *Eos cyanogenys* (pl. xlvi. fig. 1). Skeletons figured; A. B. Meyer, Abbild. Vögelsk.

Microglossus aterrimus. Egg described; E. P. Ramsay, P. Linn. Soc. N. S. W. viii. p. 27.

Pionias ruepelli. Sclater's statements as to the coloration of the adult female confirmed; J. V. Barboza du Bocage, J. Sci. Lisb. xxxiv. 1883, pp. 67–70.

Tanygnathus subaffinis, sp. n., Larat, Timor Laut, P. L. Sclater, P. Z. S. 1883, p. 53.

Trichoglossus goldiei [Zool. Rec. xix. *Aves*, p. 40] figured; J. Gould, B. New Guinea, pt. xiv.

Eos reticulata and *Chalcopsittacus scintillatus* figured; *id. l. c.* pts. xiv. & xv.

Cyclopsittacus salvadorii. Sexes and young fully described; E. Oustalet, Ann. Sci. Nat. (6) xiii. Art. 8 [1882], pp. 9–12.

Brotogerys panychlorus, sp. n., British Guiana, O. Salvin & F. D. Godman, Ibis, 1883, pp. 211 & 212, pl. ix. fig. 1.

Psittacula crassirostris, sp. n., Peru, L. Taczanowski, P. Z. S. 1883, p. 72.

Chrysotis canifrons, sp. n., Island of Aruba, West Indies, G. N. Lawrence, Ann. N. York Ac. ii. pp. 381 & 382.

Nestor notabilis. Its egg; T. H. Potts, Zool. 1883, p. 376.

Dasyptilus pesqueti figured; J. Gould, B. New Guinea, pt. xiv.

COLUMBÆ.

SHELLEY, G. E. On the *Columbidæ* of the Ethiopian Region. Ibis, 1883, pp. 258–330.

Two subfamilies are recognized—(1) *Treroninæ*, with 2 genera, *Alectrænas* (4 species) and *Treron* (9 species); and (2) *Columbinæ*, with 10 genera, viz., *Columba* (6 species), *Trocaza* (1 species), *Palumbus* (6 species), *Turturœna* (3 species), *Haplopelia* (3 species), *Turtur* (15 species), *Chalchopelia* (3 species), *Tympanistria* (1 species), *Œna* (1 species), and *Geopelia* (1 species).

HASWELL, W. A. Some Points in the Myology of the Common Pigeon. J. Anat. Phys. xvii. pp. 218-221 & 404.

Goura dalbertisi, *Otidophaps cervicalis*, *Macropygia doreya*, *Ptilopus bellus*, *P. superbus*, *P. pulchellus*, *Carpophaga poliura*. Eggs described; E. P. Ramsay, P. Linn. Soc. N. S. W. viii. pp. 26–28.

Columba livia var. "Monteauban-Taube" figured; pl. xxxi. Skulls of domestic races of pigeons figured; pl. xxxii. figs. 1–16. A. B. Meyer, Abbild. Vögelsk. pts. iv. & v.

Carpophaga finschi. Note on; E. P. Ramsay, J. L. S. xvii. pp. 25 & 26.

Turtur communis figured; H. H. Giglioli, Iconogr. Avif. Ital. fasc. xxi.

Œdirrhinus insolitus and *Ptilopus speciosus*. Skeletons figured; A. B. Meyer, Abbild. Vögelsk. pl. xxxiii.

Ptilopus wallacii figured; J. Gould, B. New Guinea, pt. xv.

Treron nasica figured; H. Schlegel, in Veth's Midden Sumatra, *Aves*, pl. iv.

Leptoptila pallida, sp. n., W. Ecuador, H. von Berlepsch & L. Taczanowski, P. Z. S. 1883, pp. 575 & 576.

Melopelia plumbescens. Probably the young of *Columba rufina*; O. Salvin & F. D. Godman, Ibis, 1883, p. 212.

Otidophaps insularis, sp. n., Fergusson Island, E. New Guinea, *iid.* P. Z. S. 1883, pp. 33 & 34.

PTEROCLETES.

Pterocles pyrenaicus, sp. n., S.W. Europe, H. Seebohm, Ibis, 1883, p. 26.

GALLINÆ.

PHASIANIDÆ.

Rheinardius ocellatus fully described; E. Oustalet, Ann. Sci. Nat. (6) xiii. Art. 12 [1882].

Pavo nigripennis. Note on; J. H. Gurney, Zool. 1883, p. 33.

Polyplectron helenæ, sp. n., Upper Burma, E. W. Oates, Ibis, 1883, pp. 136 & 137, pl. v.

Gallus domesticus var. "Houdan Huhn," skeleton figured; "Paduann. Huhn," skull figured: A. B. Meyer, Abbild. Vögelsk. pl. l.

Pucrasia josetiana, sp. n., China, P. M. Heude, Ibis, 1883, pp. 225 & 226.

Numida marchii, sp. n., Gaboon, E. Oustalet, Ann. Sci. Nat. (6) xiii. Art. i.*bis* [1882].

Perdix (*Starna*) *robusta*, sp. n., Altai, E. F. von Homeyer, MT. orn. Ver. Wien, 1883, p. 92.

Peloperdix rufirostris figured; H. Schlegel, in Veth's Midden Sumatra, *Aves*, pl. iv.

Callipepla squamata castanogastris, var. n., Texas, W. Brewster, Bull. Nutt. Orn Club, viii. pp. 34 & 35.

Tetraonidæ.

Tetrao camtschatikus and *T. urogalloides*. Notes on; L. Taczanowski, Bull. Soc. Z. Fr. viii. pp. 333–338.

Tetrao urogallus, pl. xlviii., and *T. medius*, pl. xlix.; A. B. Meyer, Abbild. Vögelsk.

Tetrastes griseiventris. Notes on; E. F. von Homeyer, MT. orn. Ver. Wien, 1883, pp. 228 & 229.

Megapodiidæ.

Lipoa ocellata. Its habits; K. W. Bennett, P. Linn. Soc. N. S. W. viii. pp. 193–199.

Talegallus pyrrhopygius. Egg described; *id. l. c.* p. 26.

Megapodius tenimberensis, sp. n., Tenimber Islands, P. L. Sclater, P. Z. S. 1883, p. 57.

GERANOMORPHÆ.

Rallidæ.

Rallina tricolor. Skeleton figured; A. B. Meyer, Abbild. Vögelsk. pl. xlii.

Ocydromus fuscus, pl. xl., and *O. sylvestris*, pl. xli. Skeletons figured; A. B. Meyer, Abbild. Vögelsk.

Notornis hochstetteri, sp. n., *id. l. c.* pls. xxxiv.–xxxvii.

Porphyrio melanonotus (pl. xxxviii.), *P. chloronotus* (pl. xxxix.), *id. l. c.*

ALECTORIDES.

Gruidæ.

Grus communis. Breeding in Norway; H. H. Slater, Zool. 1883, pp. 56–58.

Aramidæ.

Aramides wolfi, sp. n., W. Ecuador, H. von Berlepsch & L. Taczanowski, P. Z. S. 1883, pp. 576 & 577.

LIMICOLÆ.

Œdicnemidæ.

Œdicnemus illyricus. Correct name for European Thick-knee; J. E. Harting, Zool. 1883, p. 255.

Charadriidæ.

[See Sundman, G.]

Ægialitis nigris, sp. n., River Niger, J. E. Harting, Zool. 1883, pp. 409–418 [= *Æ. forbesi*; Shelley, Ibis, 1883, pp. 560 & 561, pl. xiv.]. *Cf.* J. E. Harting, Ibis, 1884, p. 119.

Podasocys montanus. Its anatomy; R. W. Shufeldt, J. Anat. Phys. xviii. pp. 86–102, pl. v.

Charadrius virginicus in Europe; J. H. Gurney, jun., Ibis, 1883, pp. 198 & 199.

Pluvianus ægyptius figured; C. B. Cory, Beautiful and Curious Birds, pt. v.

Ægialitis albidipectes, sp. n., Chili, R. Ridgway, P. U. S. Nat. Mus. v. pp. 526 & 527.

Phalaropus fulicarius near Venice; A. P. Ninni, Atti Soc. Ital. xxvi. pp. 162–164.

Scolopacidæ.

[See Sundman, G.]

Totanus haughtoni figured; J. E. Harting, Ibis, 1883, pl. iv.

Tringa maculata in Dumbartonshire; *id.* Zool. 1883, p. 177.

Eurrhinorrhynchus pygmæus. Summer plumage figured; W. E. Nelson, Cruise R.S. 'Corwin,' pl. iv.

GAVIÆ.

Laridæ.

[See Sundman, G.]

Larus kumlieni, sp. n., Cumberland Sound, W. Brewster, Bull. Nutt. Orn. Club, viii. pp. 214–219.

Larus melanocephalus and *L. canus.* Their changes of plumage; A. P. Ninni, Atti Soc. Ital. xxvi. pp. 103–107.

Larus philadelphia at St. Leonards; C. Smith, Zool. 1883, pp. 120 & 121.

Hydrochelidon leucoptera in Norfolk; R. W. Chase, Zool. 1883, p. 341.

TUBINARES.

Diomedea irrorata, sp. n., Peru, O. Salvin, P. Z. S. 1883, p. 430.

Cymochorea markhami, sp. n., Peru, *id. l. c.* p. 430.

Œstrelata fisheri, sp. n., Alaska, R. Ridgway, P. U. S. Nat. Mus. v. pp. 656–658.

Puffinus anglorum. Its note; R. M. Barrington, Zool. 1883, pp. 28 & 29.

Puffinus griseus at Bridlington; H. A. Macpherson, Zool. 1883, pp. 121 & 122. In Norfolk; T. Southwell, *l. c.* p. 179.

HERODIONES.

Ciconiidæ.

Balæniceps rex in S.W. Africa; H. H. Johnston, Ibis, 1883, p. 578.

Pseudotantalus, g. n. Type, *P. ibis*, L.; R. Ridgway, P. U. S. Nat. Mus. v. pp. 550 & 551.

Plataleidæ.

Ibis æthiopica figured; C. B. Cory, Beautiful and Curious Birds, pt. vii.

Phœnicopteridæ.

Weldon, W. F. R. On Some Points in the Anatomy of *Phœnicopterus* and its allies. P. Z. S. 1883, pp. 638–652, pls. lix. & lx.

STEGANOPODES.

Pelecanidæ.

Dubois, A. Remarques sur les oiseaux du genre Pélican (*Pelecanus*). Bull. Mus. Belg. ii. pp. 1–11.

10 species recognized. *P. barbieri*, Oust., = *P. fuscus* var. *molinæ*.

Schmidt, Max. Pelikane. Zool. Gart. xxiv. pp. 97–103 & 134–141.

Pelicans in confinement.

Pelecanus trachyrrhynchus figured; P. L. Sclater, P. Z. S. 1883, pl. xlvi.

Phalacrocorax pelagicus and *P. violaceus*. Notes on; L. Taczanowski, Bull. Soc. Z. Fr. viii. pp. 341–343.

Phalacrocorax bicristatus. Notes on its osteology; R. W. Shufeldt, Science, 1883, pp. 640–642.

Sula bassana. Its different plumages figured; E. T. Booth, Rough Notes, pt. v. (6 pls.). Near Palermo; P. Doderlein, Nat. Sicil. ii. pp. 138–140.

Sula nebouxi, sp. n., Pacific coast of America, A. Milne-Edwards, Ann. Sci. Nat. (6) xiii. Art. 4, pp. 36 & 37, pl. xiv. *S. dactylatra*, Less.; *id. l. c.* pl. xiii. [1882].

PLOTIDÆ.

Plotus chantrii, sp. n., Antioch, E. Oustalet, Ann. Sci. Nat. (6). xiii. Art. 7, pp. 7 & 8 [1882].

ANSERES.

Cygnus minor. Notes on; G. Rogeron, Bull. Soc. d'Acclim. (3) x. pp. 220–230.

Anser brachyrrhynchus in Germany, with notes on its general distribution; H. Bolau, J. f. O. 1883, pp. 76–81.

Somateria mollissima near Venice; A. P. Ninni, Atti Soc. Ital. xxvi. pp. 160–162.

Anas crecca and *A. boschas*. Hybrid between these two species [*Anas crecco-boschas*, Sev.], with remarks on other hybrids; N. Severtzoff, Bull. Mosc. lviii. pp. 352–366, pl. i.

Querquedela formosa figured; H. H. Giglioli, Iconogr. Avif. Ital. fasc. xxi.

Histrionicus minutus breeding in Newfoundland; C. Hart Merriam, Bull. Nutt. Orn. Club, viii. p. 220.

Mergus serrator, ♂ adult, summer plumage, ♀ adult and pull. figured; E. T. Booth, Rough Notes, pt. v.

PYGOPODES.

ALCIDÆ.

DYBOWSKI, B. Quelques remarques supplémentaires sur les Mormonidés. Bull. Soc. Z. Fr. viii. pp. 348–350.

Notes on *Lunda cirrhata*, *Simorrhynchus cristatellus*, *S. kamtschaticus*, and *Ciceronia pusilla*, on Behring Island.

Ciceronia pusilla. Summer plumage figured; W. E. Nelson, Cruise R. S. 'Corwin,' Birds, pl. i.

Alca impennis. Summary of known specimens; W. Blasius, JB. Ver. Braunschw. iii. pp. 89–115.

IMPENNES.

FILHOL, H. De la disposition de l'artère humérale chez le *Spheniscus demersus*. Bull. Soc. Philom. (7) vii. pp. 92 & 93.

——. Description des muscles de la région ptérygoidienne chez les Manchots. *Id. l. c.* pp. 93 & 94.

WATSON, M. Report on the Anatomy of the *Spheniscidæ*. Zool., Voy. 'Challenger,' pt. xviii. (vol. vii. pp. 1–244, pls. i.–xix).

Sub-Class RATITÆ.

OWEN, R. On *Dinornis* (pt. xxiii.): containing a description of the skeleton of *Dinornis parvus*, Owen. Tr. Z. S. xi. pp. 233–256, pls. li.–lviii.

——. On *Dinornis* (pt. xxiv.): containing a description of the head and feet, with their dried integuments, of an individual of the species *Dinornis didinus*, Owen. *L. c.* pp. 257–261, pls. lix.–lxi.

SALVADORI, T. Monografia del gen. *Casuarius*, Briss. Mem. Acc. Tor. (2) xxxiv. pp. 173–217, pls. i. & ii.

A complete monograph of the Cassowaries, with their literary history, full synonymy, and description; coloured figures of the heads of the 10 known species are given in the plates.

Struthio molybdophanes, sp. n., Somali and Galla Lands, A. Reichenow, Sontagsb. Nordd. Zeit. 37, Sept. 1883; Somali Land, *id.* MT. Orn. Ver. Wien, 1883, p. 202, pl. [*cf.* Reichenow & Schalow, J. f. O. 1883, p. 399].

Rhea. Organs of respiration. [See PARKER, W. N.]

Rhea americana. A right carotid present in the young; F. P. Evans, Ann. N. H. (5) xi. p. 458.

REPTILIA AND BATRACHIA.

BY

G. A. BOULENGER.

GENERAL.

H. ALLEN has a note on the Spinal Chord of *Batrachia* and *Reptilia*; P. Ac. Philad. 1883, p. 56.

O. BÖTTGER reports on new or interesting Reptiles in the collection of the Heidelberg University; Ber. offenb. Ver. 1883, pp. 147–152.

HERTWIG, O. Die Entwicklung des mittleren Keimblattes der Wirbelthiere. Jen. Z. Nat. xvi. Das mittlere Keimblatt der Amphibien, b. *Rana temporaria*, pp. 247–286, pls. xiv.–xvii. Das mittlere Keimblatt der Reptilien, pp. 290–292.

FAUNÆ.

EUROPE.

LEYDIG, F. Ueber die einheimischen Schlangen. Zoologische und anatomische Bemerkungen. Abh. senck. Ges. xiii. pp. 167–220, pls. i. & ii.

This contribution, which completes the series published by the same author on the Reptiles and Batrachians of Germany, is divided into two parts:—1. Zoological remarks, in which the author treats of the six species indigenous to that country, remarking that *Vipera ammodytes* is to be excluded from the fauna, and that the occurrence of *Zamenis viridiflavus* is doubtful; 2, Anatomical remarks.

KOLOMBATOVIC, G. Mammiferi, Rettili, ed Anfibi della Dalmazia. Spalato: 1882, 8vo.

[Not seen by Recorder.]

ETTA, E. DE. Terza serie di note erpetologiche per servire allo studio dei Rettili ed Anfibi d'Italia. Atti Ist. Venet. (7) i. pp. 919–951.

BEDRIAGA, J. v. Beiträge zur Kenntniss der Amphibien und Reptilien der Fauna von Corsika. Arch. f. Nat. (2) xlix. pp. 124–273, pls. iii.–v.

In a first chapter, the species collected by the author himself are

discussed, and in a second chapter those observed by others in Corsica are enumerated. The total number of Reptiles amounts to 11, of Batrachians to 7.

[Bedriaga, J. v.] Die Amphibien und Reptilien Griechenlands. Zool. Anz. vi. pp. 216–220.

Corrections of the author's previous paper [*cf.* Zool. Rec. xviii. *Rept.* p. 1].

Asia.

Lortet, L. Poissons et Reptiles du Lac de Tibériade et de quelques autres parties de la Syrie. Arch. Mus. Lyon, iii.

On pp. 183–189, a list of the Reptiles and Batrachians obtained by the author is given, with remarks on the more interesting, some of which are figured.

Böttger, O. Liste von Reptilien und Amphibien der niederländisch-indischen Insel Bangka, der Siamesischen Insel Salanga, und von Atschin in Nord-Sumatra. Ber. offenb. Ver. 1883, pp. 152–155.

Horst, R. On new and little-known Frogs from the Malayan Archipelago. Notes Leyd. Mus. v. pp. 235–244.

Boulenger, G. A. Report on a Collection of Reptiles and Batrachians from the Timor Laut Islands, formed by Mr. H. O. Forbes. P. Z. S. 1883, pp. 386–388, pls. xli. & xlii.

A list of 15 Reptiles, 2 of which are described as new, and 2 Batrachians.

Africa.

Böttger, O. Die Reptilien und Amphibien von Marocco. ii. Abh. senck. Ges. xiii. pp. 93–146, pl.

Contains a complete list of the Reptiles and Batrachians hitherto recorded from Morocco, with copious notes on various known species and descriptions of those recently discovered.

——. Liste von Reptilien aus Smithfield, Transvaal. Ber. offenb. Ver. 1883, pp. 155 & 156.

Taschenberg, O. Beiträge zur Fauna der Insel Sokotra, vorzüglich nach dem von Herrn Dr. Emil Riebeck aus Halle-a-S. gesammelten Materiale zusammengestellt. Z. ges. Naturw. (4) ii. pp. 157–218.

A list of the Reptiles, pp. 164–169, compiled from the accounts of Günther and Peters.

America.

Yarrow, H. C. Check List of North American *Reptilia* and *Batrachia*, with Catalogue of Specimens in U. S. National Museum. Bull. U. S. Nat. Mus. No. 24, 249 pp.

GARMAN, S. North American Reptiles. Part 1. *Ophidia*. Mem. Mus. C. Z. ii. xxxi. 185 pp., 9 pls.

In the introduction, a concise account of the various groups of Reptiles and Batrachians is given; the author then proceeds to describe the Snakes of North America, taking as southern limit the Isthmus of Tehuantepec.

SMITH, W. H. Report on the Reptiles and Amphibians of Ohio. Rep. Geol. Surv. Ohio, Zool. Bot. iv. pp. 633–734 [1882].

Short descriptions of, and keys to, the families, genera, and species.

COPE, E. D. Notes on the Geographical Distribution of *Batrachia* and *Reptilia* in Western North America. P. Ac. Philad. 1883, pp. 10–35.

Notes based on collections made at various points in the Rocky Mountains and Pacific districts, with description of the range of various species, and contributions to the final definition of the zoological provinces and districts of the North American continent. 5 new species are described.

DAVIS, —, & RICE, —. North American *Batrachia* and *Reptilia* found east of the Mississippi River. Bull. Illin. Lab. Nat. Hist. No. 5.

[Not seen by Recorder.]

BOCOURT, F. Mission Scientifique au Mexique et dans l'Amérique Centrale. III.e Partie, Études sur les Reptiles et les Batraciens. Paris: 1883, folio, 9e livr. pp. 529–592, pls. xxxi.–xxxv.

Treats of the Calamaroid Snakes.

BROCCHI, P. Mission Scientifique au Mexique, &c. III.e Partie, 2 sect., Études sur les Batraciens. Paris: 1883, folio, 3e livr. pp. 97–122, pls. xvi.–xxi.; also pl. vii., omitted from the preceding fascicle.

Concludes the work.

BOULENGER, G. A. Descriptions of New Species of Lizards and Frogs collected by Hr. A. Forrer in Mexico. Ann. N. H. (5) xi. pp. 342–344.

POLYNESIA.

BOULENGER, G. A. On the Geckos of New Caledonia. P. Z. S. 1883, pp. 116–131, pls. xxi. & xxii.

The 14 species occurring in these islands are described, and their synonymy discussed; 1 is described as new.

PALÆONTOLOGICAL.

COPE, E. D. Fourth Contribution to the History of the Permian Formation of Texas. P. Am. Phil. Soc. xx. pp. 628–636.

1 new species of Batrachians, and 1 new genus and 3 new species of Reptiles, are described.

LYDEKKER, R. Synopsis of the Fossil *Vertebrata* of India. Rec. Geol. Surv. Ind. xvi. pp. 61–93.

Sauvage, H. E. Recherches sur les Reptiles trouvés dans l'étage rhétien des environs d'Autun. Ann. Sci. géol. xiv. Art. 3, 44 pp., pls. vi.–ix.

The author compares the herpetological fauna of the Rhætian horizon with that of the Trias and Lias, and describes 2 new genera and 3 new species.

REPTILIA.

Braun, M. Bau und Entwicklung der Nebennieren bei Reptilien. Arb. Inst. Würzb. v. pp. 1–30, pls. i. & ii.

[Omitted from the preceding Record.]

Bronn, H. G. Klassen und Ordnungen des Thierreichs. vi. Abth. iii. pp. 1009–1264, pls. liv.–lvii. *Reptilia*, by C. K. Hoffmann.

Conclusion of the anatomy of the *Lacertilia*, and systematic part of the *Crocodilia* and *Lacertilia*.

Hoffmann, B. Die Thränenwege der Vögel und Reptilien. Z. ges. Naturw. lv. [1882] pp. 375–415 & 443–479, pls. i.–iii.

Alice Johnson, in a paper on the development of the pelvic girdle of the Chick, discusses the homologies of the two branches of the Reptilian pubis. Q. J. Micr. Sci. xxiii. pp. 405–409.

Mercanti, F. Recherches sur le muscle ciliaire des Reptiles. Arch. Ital. Biol. iv. pp. 197–202.

Abstract of a forthcoming memoir.

Nathusius-Königsborn, W. v. Die Eihaut von *Python bivittatus*, mit Bermerkungen über einige andere Reptilieneier und die Genesis dieser Eihäute. Z. wiss. Zool. xxxviii. pp. 584–620, pls. xxxiii. & xxxiv.

Strahl, H. Beiträge zur Entwickelung der Reptilien. Arch. Anat. Phys. 1883, pp. 1–43, pl. i.

ORNITHOSAURIA.

T. C. Winkler describes and figures a specimen of *Rhamphorrhynchus* (sp. ?), probably from the lithographic slates of Bavaria. Arch. Mus. Teyl. (2) i. p. 219, pl. iv.

DINOSAURIA.

Dollo, L. Note sur la présence chez les Oiseaux du 'troisième trochanter' des Dinosauriens et sur la fonction de celui-ci. Bull. Mus. Belg. ii. pp. 13–20, pl. i.

O. C. Marsh, Am. J. Sci. xxvi. pp. 81–85, pl. i., gives a restoration of *Brontosaurus excelsus*, Marsh, and diagnoses of the order *Sauropoda* and its two families, *Atlantosauridæ* and *Morosauridæ*.

L. Dollo contributes two further papers on the Bernissart Iguanodons. In his third note, the author gives a complete restoration of *Iguanodon bernissartensis*, describing more specially the pelvic arch and the hind limb; he also remarks on the footprints discovered in other countries, and pronounces those from the Wealden of Hanover, described by Struckmann, to belong to *I. mantelli*. The author concludes by stating that the mode of life of the Iguanodons was more aquatic than terrestrial, and that, on land, they progressed on their hind limbs only. Bull. Mus. Belg. ii. pp. 85–120, pls. iii.–v.

In his fourth note, the skull of *Iguanodon bernissartensis* is figured and described, and the principal characters of the vertebral column are given. In an appendix to this paper, the characters assigned by Cope to the skull of *Diclonius mirabilis* are compared with those of *Iguanodon*. L. c. pp. 223–248, pls. ix. & x.

On the same Iguanodons; H. N. Moseley, Nature, xxviii. pp. 439 & 514.

J. W. Hulke, in his anniversary presidential address to the Geological Society, enters into some details respecting the Iguanodons of Bernissart. *Iguanodon seelyi* is probably identical with *I. bernissartensis*. The restoration of the sternal apparatus given by Dollo is discussed, and an ideal restoration with the "sternal bones" placed as "clavicles" is given. J. G. Soc. xxxix. pp. (61)–(63), woodcuts.

Sphenospondylus, g. n., for dorsal vertebræ from the Isle of Wight, possibly referable to *Iguanodon seelyi*; H. G. Seeley, J. G. Soc. xxxix. p. 55, woodcuts.

Hypsilophodon foxi, Ow. J. W. Hulke has an extensive paper on this Dinosaur, figuring various parts and a restoration of the whole skeleton. Phil. Tr. clxiii. pp. 1035–1062, pls. lxxi. & lxxii.

Orthomerus, g. n., apparently intermediate between *Iguanodon* and *Hadrosaurus*, for *O. dolloi*, sp. n., from a femur; Seeley, J. G. Soc. xxxix. p. 248, Maestricht beds. L. Dollo, Bull. Mus. Belg. ii. p. 205, woodcuts, describes and figures vertebræ of the same animal.

E. D. Cope has an extensive preliminary paper on the characters of the skull of the *Hadrosauridæ*, with special reference to *Diclonius mirabilis*, Leidy, which is figured. He criticizes Marsh's recent essay of classification of the group *Dinosauria*, which he maintains as an Order divisable into four suborders, viz., *Opisthocœla*, Owen (= *Sauropoda*, Marsh), *Orthopoda*, Cope (= *Stegosauria* and *Ornithopoda*, Marsh), *Goniopoda*, Cope, and *Hallopoda*, Marsh. P. Ac. Philad. 1883, pp. 97–107, pls. iv.–vii.; abstract in Am. Nat. xvii. pp. 774–777.

Craspedodon lomzeensis, g. & sp. nn., for teeth of a herbivorous Dinosaur from the Upper Cretaceous of Lomzée, Belgium; Dollo, Bull. Mus. Belg. ii. p. 218, woodcuts.

Megalosaurus bucklandi. R. Owen has an extensive paper on the skull of this Dinosaur, figuring the facial part and portions of the jaws, as well as an ideal restoration of the entire skull; J. G. Soc. xxxix. pp. 334–347, woodcut, pl. xi.

Megalosaurus bredai [after Van Breda], sp. n., for a very imperfect femur from the Maestricht beds, Seeley, J. G. Soc. xxxix. p. 246, woodcut.

Actiosaurus, g. n., near *Palæosaurus*, for *A. gaudrii*, sp. n., Sauvage, Ann. Sci. géol. xiv. Art. 3, p. 10, pl. i. figs. 1 & 2 (femur and humerus), Rhætic beds of Antully, France.

Rachitrema [*Racheot-*], g. n., for *R. pellati*, sp. n., Sauvage, *l. c.* p. 7, pls. vi. fig. 3, vii. figs. 2–5, & ix. figs. 5 & 6, Rhætic beds of Antully.

L. Dollo, Bull. Mus. Belg. ii. p. 213, woodcut, describes and figures an ungueal phalange of an unnamed carnivorous Dinosaur from the Upper Cretaceous of Lomzée, Belgium.

CHELONIA.

Describing fossil remains referred to *Sphargis*, P. J. Van Beneden remarks on the affinity of the various groups of Chelonians with one another and with the other *Reptilia*; Bull. Ac. Belg. (3) vi. pp. 680–683.

E. D. Cope, P. Am. Phil. Soc. xx. pp. 143–146 [omitted from the preceding Record], gives an analysis of the genera of the "Cryptodire" division of Tortoises which have been found in a fossil state in North America. They are arranged in the following 3 groups and 11 families:—

I. Dactylosterna.
1, *Cheloniidæ*; 2, *Propleuridæ* (foss.); 3, *Trionychidæ*; 4, *Chelydridæ*.

II. Clidosterna.
5, *Pleurosternidæ* (foss.); 6, *Baenidæ* (foss.); 7, *Adocidæ* (foss.); 8, *Emydidæ*; 9, *Cinosternidæ*, 10, *Testudinidæ*.

III. Lysosterna.
11, *Cistudinidæ*.

Portis, A. Les Chéloniens de la Molasse Vaudoise conservés dans le Musée géologique de Lausanne. Abh. schw. pal. Ges. ix. [1882] pp. 1–78, pls. i.–xxix.

Charbonnel-Salle, L. Recherches anatomiques et physiologiques sur le Mécanisme de la Respiration chez les Chéloniens. Ann. Sci. Nat. (6) xv. Art. 6, 20 pp., woodcuts.

Eisig, H. Einfluss der Wassertemperatur auf Fische und Schildkröten. Kosmos, xii. pp. 442 & 443.

Testudo kleinmanni, sp. n., Lortet, Arch. Mus. Lyon, iii. p. 188, Syria and Egypt.

Ptychogaster, Pomel. (foss.). L. Vaillant remarks on this Tortoise which he regards as intermediate between *Emys* and *Testudo*; there is no evidence of there being more than one species, *P. emydoides*, Pomel, C. R. xcvii. pp. 1152-1154. A. Gaudry makes remarks on a restoration of this fossil: *l. c.* p. 1154.

Cinixys (*Ptychogaster*) *gaudini*, Pict. & Humb. (foss.), described and figured by Portis, *l. c.* p. 37, pls. xiv. & xv. figs. 1, 16 & 17.

Cistudo heeri, sp. n. (foss.), Portis, *l. c.* p. 47, pls. xviii.–xx., Molasse of Vaud.

Emys laharpi, Piet. & Humb. (foss.), described and figured; *id. l. c.* Gaudrds. i.–iii.

Emys tuberculata, p. 19, pl. iv., *lignitarum*, p. 21, pls. v. & vi., fig. 1, *Nuevieri*, p. 24, pls vii. & viii., and *sulcata*, p. 29, pls. ix.–xii., spp. nn. (foss.), *id. l. c.*, Molasse of Vaud, Switzerland.

Pleurosternon miocænum, sp. n. (foss.), *id. l. c.* p. 34, pl. xiii., Molasse of Vaud.

Polysternon, g. n. (foss.), near *Pleurosternon*, for *Pleurosternon provinciale*, Matheron; *id. l. c.* p. 74. Carapace and plastron described and figured; *id. l. c.* p. 65, pls. xxviii. & xxix.

Trionyx lorioli, p. 54, pls. xxi.–xxiii., *rochettiana*, p. 56, pls. xiv. & xv., and *valdensis*, p. 58, pls. xxvi. & xxvii., spp. nn. (foss.), *id. l. c.*, Molasse of Vaud.

Thalassochelys corticata figured; Leitfaden für das Aquarium Neap. pl. xlvii.

Sphargis coriacea. On its occurrence on the Italian coast; De Betta, Atti Ist. Venet. (7) i. p. 928.

Sphargis rupeliensis, sp. n. (foss.), P. J. Van Beneden, Bull. Ac. Belg. (3) vi. p. 665, pl., Rupelian clay of Belgium.

ANOMODONTIA.

E. D. Cope has notes on a pelvis and sacrum of a species of the group *Diadectidæ*, from the Permian formation of Texas; P. Am. Phil. Soc. xx. p. 448.

On a tooth, referable to the same group, from the Permian of Illinois; *id.* P. Ac. Philad. 1883, p. 108.

Empedias phascolinus, Cope. Note; *id.* P. Am. Phil. Soc. xx. p. 635.

Empedias fissus, sp. n., *id. ibid.*, Permian of Texas.

Chilonyx, g. n., near the *Diadectidæ* and *Bolosauridæ*, for *C. rapidens*, sp. n., *id. l. c.* p. 631, and P. Ac. Philad. 1883, p. 69, Permian of Texas.

PLESIOSAURIA.

Kiprijanoff, W. Studien über die fossilen Reptilien Russlands. III. Theil: Gruppe *Thaumatosauria*, aus der Kreide-Formation und dem Moscauer Jura. Mém. Pétersb. (7) xxxi. No. 6, 57 pp., 21 pls.

Under the name *Thaumatosauria*, the author proposes to group the [illegible] genera *Pliosaurus*, Ow., *Polyptychodon*, Ow., and *Thaumatosaurus*, [illegible]y. He describes and figures remains of *Polyptychodon interruptus*, Ow., p. 7, pls. i. figs. 1 & 2, ii. figs. 1–3, iii. figs. 1 & 2, iv. figs. 1–6, v. figs. 1–5, viii. figs. 1–4, ix. figs. 1 & 2, x., & xi. figs. 1 & 2, and *Thaumatosaurus mosquensis*, sp. n., p. 27, pls. xi figs. 4–9 & xii.–xv., from the Jurassic of Moscow.

Lutkesaurus, g. n. [named in honour of Comte Lütke!], for remains of *Thaumatosauria* from the "Sewerische Osteolithe" of Kursk; Kiprijanoff, *l. c.* p. 35, pls. iii. fig. 3, xi. fig. 3, xv. fig. 2, & xvii.–xxi.

R. Owen writes on generic characters in the Order *Sauropterygia*, and figures diagrammatic restorations of the sternal apparatus of *Plesiosaurus* and *Pliosaurus*; J. G. Soc. xxxix. pp. 133–138, woodcuts.

J. W. Hulke discusses the characters of the shoulder-girdle and limbs of *Ichthyosauria* and *Plesiosauria*, and remarks on our present state of knowledge regarding these extinct reptiles; *op. cit.* pp. (44)-(60), woodcuts.

Plesiosaurus costatus, Owen. H. E. Sauvage, Ann. Sci. géol. xiv. Art. 3, p. 24, pl. vi. fig. 5, describes and figures cervical vertebræ from the Rhætic beds of La Coudre and Antully, France.

Plesiosaurus bitractensis, sp. n., *id. l. c.* p. 20, pls. viii. fig. 5, & ix. figs. 1 & 2, Rhætic beds of Antully and La Coudre.

ICHTHYOSAURIA.

See Hulke, *suprà*.

Ichthyosaurus rheticus, Sauvg., p. 14, pls. viii. fig. 4, & ix. fig. 3, and *carinatus*, Sauvg., p. 17, pls. vii. fig. 1, viii. figs. 1–3, & ix. fig. 4, described by Sauvage, Ann. Sci. géol. xiv. Art. 3.

CROCODILIA.

L. Dollo, in a "Première Note sur les Crocodiliens de Bernissart" (Bull. Mus. Belg. ii. pp. 309-338), discusses the systematic arrangement of the Crocodilians, recent and fossil, and adopts the following classification, a slight modification of Huxley's:—

Suborder I. *Parasuchia*.

„ II. *Mesosuchia*.

1, *Teleosauridæ*; 2, *Goniopholidæ*; 3, *Bernissartidæ* (fam. n.).

„ III. *Eusuchia*.

1, *Gavialidæ*; 2, *Crocodilidæ*; 3, *Alligatoridæ*.

Parker, W. K. On the Structure and Development of the Skull in the *Crocodilia*. Tr. Z. S. xi. pp. 263–310, pls. lxii.–lxxi.

Kiprijanoff, W. Studien über die fossilen Reptilien Russlands. iv. Theil: Ordnung *Crocodilia*. Indeterminirte fossile Reptilien. Mém. Pétersb. (7) xxxi. No. 7, 29 pp., 7 pls.

Contains, besides notes on the microscopical texture of the bone of *Ichthyosaurus campylodon*, Cart., p. 1, pl. ii., *Polyptychodon interruptus* Ow., p. 4, pl. i. fig. 1, & v. fig. 1, and *Lutkesaurus*, Kiprij. [cf. *suprà*], pl. i. figs. 2 & 3, & v. fig. 2, description and figure of remains of *Pœcilopleuron schmidti*, sp. n., p. 9, pl. iv. figs. 1–5, & v. fig. 4, from the "Sewerische Osteolithe" of Kursk. The rest of the paper deals with unnamed remains.

Tafani, A. Parcours et terminaison du nerf optique dans la rétine des Crocodiles (*Champsa lucius*). Arch. Ital. Biol. iv. pp. 210–233, 1 pl.

Diplocynodon rateli, Pomel. On a restoration of this Crocodilian; Gaudry, C. R. xcvii. p. 1154.

Goniopholis simus, Owen (foss.). A restoration given by Dollo, Bull. Mus. Belg. ii. p. 315, pl. xii. fig. 2, from specimens from the Wealden of Bernissart, Belgium.

Bernissartia, g. n. (foss.). Type of a new family, from which probably a part of the recent Crocodilians originated; Dollo, *l. c.* p. 321. *B. fagesi*, sp. n., *id. ibid.* pl. xii. fig. 1, Wealden of Bernissart, Belgium.

Crocodilus robustus, Vaill. & Grand. This second Madagascar crocodile, which was described as fossil in 1871, has now been discovered alive, and is described by Vaillant, C. R. xcvii. p. 1081.

RHYNCHOCEPHALIA.

Albrecht, P. Note sur la présence d'un rudiment de proatlas sur un exemplaire de *Hatteria punctata*, Gray. Bull. Mus. Belg. ii. pp. 185–194, pl. viii. figs. 1 & 2.

LACERTILIA.

Dollo, L. On the Malleus of the *Lacertilia*, and the Malar and Quadrate Bones of *Mammalia*. Q. J. Micr. Sci. xxiii. pp. 579–596, pl. xli.

Eimer, T. Ueber gesetzmässige Zeichnung der Reptilien, speciell der Eidechsen. JB. Ver. Württ. 1882, pp. 114 & 115.

[Omitted from the preceding Record.]

Sarasin, C. F. Reifung und Furchung des Reptilieneies. Arb. Inst. Würzb. vi. pp. 159–216, pls. xii.–xv. [*Lacerta agilis.*]

Strahl, H. Ueber Canalis neurentericus und Allantois bei *Lacerta viridis*. Arch. Anat. Phys. 1883, pp. 323–340, pl. xiv.

——. Die Entwicklungsvorgänge am vorderen Ende der Embryonen von *Lacerta agilis* und *vivipara*. Zool. Anz. vi. pp. 17–19.

——. Über frühe Entwicklungstadien von *Lacerta agilis*. L. c. pp. 347–350.

Weldon, W. F. R. Note on the Early Development of *Lacerta muralis*. J. Micr. Sci. xxiii. pp. 134–144, pls. iv.–vi.

Geckonidæ.

Bi[illegible]ta. A. Boulenger, Ann. N. H. (5) xii. p. 308, proposes to cancel the [illegible]order *Nyctisaura*.

J. v. Fischer has notes on the shedding of the skin in Geckos. Zool. Gart. xxiv. pp. 147–150.

Rhacodactylus, Fitz. Under this name, Boulenger, P. Z. S. 1883, p. 123, proposes to unite *Correlophus*, Guich., *Ceratolophus*, Bocage, and

Chameleonurus, Blgr. The 6 following species are described:—*R. leachianus*, Cuv., p. 124, *aubryanus*, Boc., p. 125, *chañoua*, Bav., p. 125, pl. xxi. fig. 1, *trachyrrhynchus*, Boc., p. 126, fig. 2, *auriculatus*, Bav., p. 127, and *ciliatus*, Guich., p. 128.

Eurydactylus vieillardi, Bav., described; Boulenger, P. Z. S. 1883, p. 129.

Tarentola mauritanica, L. Skeleton described by E. Ficalbi, Atti Soc. Tor. v. pp. 287–330, pls. xiii. & xiv.

Pachydactylus quadriocellatus, sp. n., Peters, SB. nat. Fr. 1883, p. 28, Madagascar.

Lepidodactylus lugubris, D. & B., p. 120, pl. xxii. fig. 3, *cyclurus*, Gthr., p. 121, fig. 4, and *crepuscularis*, Bav., p. 122, fig. 6, described by Boulenger, *l. c.*

Hemidactylus garnoti, D. & B., described; *id. l. c.* p. 118, pl. xxii. fig. 1.

Gehyra vorax, Gir., described; *id. l. c.* p. 119, pl. xxii. fig. 2.

Scalabotes pictus, *bivittis*, and *hildebrandti*, spp. nn., Peters, *l. c.* p. 28, Madagascar.

Microscalabotes, g. n. Allied to *Lygodactylus*; for *M. cowani*, sp. n., Boulenger, Ann. N. H. (5) xi. p. 174, Madagascar.

Gymnodactylus arnouxi, A. Dum., described by Boulenger, P. Z. S. 1883, p. 129.

Saurodactylus, Fitz. Remarks by Böttger, Abh. senck. Ges. xiii. p. 124.

Quedenfeldtia, subg. n., for *Saurodactylus trachyblepharus*, Böttg., *id. l. c.* p. 126.

Eublepharidæ.

A new family, established by Boulenger, Ann. N. H. (5) xii. p. 308, differing from the *Geckonidæ* in the procœlous vertebræ and coalesced parietal bones, and comprising the genera *Eublepharis*, *Psilodactylus*, and *Coleonyx*.

Agamidæ.

Lophognathus, Gray. Boulenger, Ann. N. H. (5) xii., distinguishes 4 species, viz., *L. gilberti*, Gr., *longirostris*, sp. n., p. 225, Champion Bay, *labialis*, sp. n., p. 225, Port Essington, and *maculilabris*, sp. n., p. 226, Timor Laut. The latter species also described and figured; *id.* P. Z. S. 1883, p. 386, pl. xli.

Chamydosaurus kingi. Its myology, by C. W. De Vis, P. Linn. Soc. N. S. W. viii. pp. 1–320, pls. xiv.–xvi.

Brachysaura ornata, Blyth. Redescribed, with extensive remarks on the habits; Cockburn, J. A. S. B. li. pt. 2, p. 50. [Omitted from the preceding Record.]

Uromastix acanthinurus. Note on its habits; H. Goll, Bull. Soc. Vaud. xviii. pp. 230–234, pls. xii. & xiii.

Iguanidæ.

Anolis principalis, L. R. W. Shufeldt, Am. Nat. xvii. pp. 919–926, has observations on the habits of this Lizard, of which a figure is given on p. 920.

Enyalius palpebralis, sp. n., Boulenger, P. Z. S. 1883, p. 46, pl. x., E. Peru.

Sceloporus garmani, sp. n., *id. op. cit.* 1882, p. 761, pl. lvi., Dacota.

Uta (*Phymatolepis*) *lateralis*, sp. n., *id.* Ann. N. H. (5) xi. p. 342, W. Mexico.

Anguidæ.

Propseudopus, g. n. (foss.). Apparently related to *Pseudopus*, with divided parietal bone; Hilgendorf, SB. nat. Fr. 1883, p. 139. *P. fraasi*, sp. n., *id. ibid.*, Steinheim, Württemberg.

Anguis fragilis, L. G. Born reports on the presence of external rudiments of fore limb in embryos of the Slow-worm; Zool. Anz. vi. pp. 537–539. On a young monstrous specimen; De Betta, Atti Ist. Venet. (7) i. p. 932.

Helodermatidæ.

Heloderma suspectum, Cope. Weir, Mitchell, & Reichert have made experiments on the physiological action of Heloderm-poison. They find that this Lizard's mouth-liquids are highly poisonous, killing frogs, pigeons, and rabbits in a few minutes; also that the physiological action of the poison is quite different from that of snake-poison; the latter kills essentially by paralyzing the respiratory centre, the former by paralyzing the heart. Medical News, Feb. 10, 1883. [Not seen by Recorder; *cf.* Science, i. p. 372.]

On the same subject; Boulenger, P. Z. S. 1882, p. 631, and Fayrer, *l. c.* p. 632.

Xantusiidæ.

Xantusia riversiana, sp. n., Cope, Am. Nat. 1879, p. 801, California [omitted from Zool. Rec. xvi.]. Described by Cope, P. Ac. Philad. 1883, p. 29. The position of the genus *Xantusia* is discussed, and considered to be near the *Lacertidæ*, forming, with *Lepidophyma*, A. Dum., and *Cricosaura*, Ptrs., a family characterized by the distinct parietal bones and the absence of eyelids.

Tejidæ.

Cnemidophorus affinis, sp. n., Fischer, Oster-Progr. Akad. Gymn. Hamburg, 1883, p. 1, pl., figs. 1 & 2, Hayti.

Herpetochalcis, g. n. Distinguished from *Microdactylus*, Tsch., by the number of digits (3–2 instead of 3–3), and the presence of two supraocular tals instead of three. For *H. heteropus*, sp. n., Böttger, Ber. offenb. B[illegible] 1883, p. 150, Central America?.

Amphisbænidæ.

Rhineura floridana, Baird. Garman, Science Observer, iv. p. 47, remarks that the eye is distinct in the young.

Lacertidæ.

Lacerta muralis, Laur. Bedriaga makes a few remarks on the races of this Lizard, in reply to some of Eimer's criticisms; *L. praticola*, Eversm., would be distinct from *L. muralis*: Zool. Anz. vi. p. 219. Remarks on this Lizard in Württemberg by Klunzinger, JH. Ver. Württ. xxxix. p. 108.

Lacerta oxycephala, Fitz. Further extensive notes by Bedriaga, Arch. f. Nat. (2) xlix. p. 260.

Lacerta peloponnesiaca, Bibr. Remarks upon, and rehabilitation of, this species, which has lately been regarded as synonymous with *L. taurica*, Pallas; Bedriaga, Zool. Anz. vi. p. 216.

Algira (*Zerzumia*) *microdactyla*, Böttg., described and figured by Böttger, Abh. senck. Ges. xiii. p. 111, pl. i. fig. 2.

Podarces (*Mesalina*) *simoni*, Böttg., described, and head figured, by Böttger, *l. c.* p. 116, pl. i. fig. 3.

Holaspis, Gray. C. K. Hoffmann, Bronn's Thierreich, Rept. p. 1065, makes a new family, *Holaspidæ*, for this Lizard.

Gerrhosauridæ.

Gerrhosaurus flavigularis var. n. *quadrilineata*, Böttger, Ber. offenb. Ver. 1883, p. 156, Transvaal.

Scincidæ.

Eumeces bocourti, sp. n., Boulenger, Ann. N. H. (5) xi. p. 342, Presidio, W. Mexico.

Eumeces (*Plestiodon*) *dugesi*, sp. n., Thominot, Bull. Soc. Philom. (7) vii. p. 138, Mexico.

Hinulia elegans is viviparous; J. J. Fletcher, P. Linn. Soc. N. S. W. viii. p. 215.

Lipinia anolis, sp. n., Boulenger, Ann. N. H. (5) xii. p. 162, Solomon Islands.

Euprepes (*Tiliqua*) *elegans*, sp. n., Fischer, Oster-Progr. Akad. Gymn. Hamburg, 1883, p. 3, pl., figs. 12–15, Sierra Leone.

Trachysaurus asper, Gray. On specimens in captivity; W. Haacke, Zool. Gart. xxiv. pp. 225–227.

Seps chalcides. On its occurrence in Piedmont; De Betta, Atti Ist. Venet. (7) i. p. 931.

Gongyloseps, subg. n. for *Seps mionecton*, Böttg.; Böttger, Abh. senck. Ges. xiii. p. 122.

OPHIDIA.

Garman, S. North American Reptiles. Part I. *Ophidia* [suprà, p.]. The following arrangement of the American Snakes is adopted :—

I. Scolecophidia.

Typhlopidæ (*Typhlopinæ*, *Stenostominæ*).

II. Onychophidia.

Erycidæ, *Boæidæ*.

III. ACACOPHIDIA.

Colubridæ (*Dipsadinæ*, *Scytalinæ*, *Dendrophinæ*, *Natricinæ*, *Colubrinæ*, *Coronellinæ*, *Calamarinæ*).

IV. TOXICOPHIDIA.

1. *Proteroglypha.*
   - A. *Conocerca.*
     Elapidæ.
   - B. *Platycerca.*
     Hydrophidæ.

2. *Solenoglypha.*
   - A. *Bothrophera.*
     Crotalidæ.

ALBRECHT, P. Note sur une hémivertèbre gauche surnuméraire de *Python sebæ*, Dum. Bull. Mus. Belg. ii. pp. 21–34, pl. ii. figs. 1–4.

BLANCHARD, R. Nouvelles recherches sur le péritoine du Python de Séba. Bull. Soc. Z. Fr. 1882, pp. 237–243.

LUSSANA, P. Sur le Cerveau du Boa; Considérations sur la Neurophysiologie comparée. Arch. Ital. Biol. iv. pp. 283–286.

Abstract of a forthcoming memoir.

On ways in which the increase of Snakes is kept within moderate limits; G. H. R. Fisk, P. Z. S. 1883, p. 32.

How Snakes approach and swallow their prey; B. Horsford, Am. Nat. xvii. p. 896.

Do Snakes shelter their young in their throats? C. C. Hopley, J. Sci. (3) v. p. 365; J. Simpson, *l. c.* p. 473.

TYPHLOPIDÆ.

Typhlops syriacus, Jan, described and figured by Lortet, Arch. Mus. Lyon, iii. p. 183, pl. xix. fig. 1.

Typhlops reuteri, sp. n., Böttger, Zool. Anz. iv. [1881] p. 650, Nossi Bé [omitted from Zool. Rec. xviii.].

Typhlops wilderi, sp. n., Garman, Science Observer, iv. p. 48, São Cyriaco, Brazil.

Typhlops (*Idiotyphlops*) *emunctus*, sp. n., Garman, Mem. Mus. C. Z. ii. p. 3, Central America.

STENOSTOMATIDÆ.

Stenostoma tenuiculum, p. 5, San Luis Potosi, Mexico, *myopicum*, p. 6, Tampico, Mexico, and *rubellum*, p. 130, Texas, spp. nn., Garman, Mem. Mus. C. Z. ii.

BOIDÆ.

B[illegible]*oa constrictor* var. n. *isthmica*, Garman, Mem. Mus. C. Z. ii. p. 9, [illegible]ntral America.

PALÆOPHIIDÆ.

Palæophis oweni, sp. n. (foss.), Zigno, Mem. Ist. Venet. xxi. p. 3, pl. xv. figs. 9–12, Eocene of Venetia.

COLUBRIDÆ.

Carphopis amœna, Say, described by Bocourt, Miss. Sci. Mex., p. 535, pl. xxxii. figs. 1, 6 & 2; figured by Garman, Mem. Mus. C. Z. ii. pl. vii. fig. 1.

Virginia striatula, L., fig. 2, and *valeriæ*, B. & G., fig. 3, figured by Garman, *l. c.* pl. vii.

Virginia inornata, sp. n., *id. l. c.* p. 97, Texas.

Tantilla gracilis, B. & G., figured by Garman, *l. c.* pl. vi. fig. 3.

Conocephalus striatulus, L., described by Bocourt, *l. c.* p. 541, pl. xxxii. fig. 5.

Adelphicus quadrivirgatus, Jan, described by Bocourt, *l. c.* p. 554, pl. xxxii. figs. 11 & 12.

Homalocranion gracile, B. & G., p. 579, pl. xxxvi. fig. 5, *bimaculatum*, Cope, p. 580, pl. xxxvi. fig. 6, *planiceps*, Blainv., p. 58, pl. xxxvi. fig. 7, *mœstum*, Gthr., p. 583, pl. xxxvi. fig. 9, *melanocephalum*, L., p. 588, pl. xxxvii. fig. 4, *coronatum*, B. & G., p. 589, pl. xxxvii. fig. 5, and *rubrum*, Cope, p. 590, pl. xxxvii. fig. 6, described by Bocourt, *l. c.*

Homalocranion præoculum, p. 582, pl. xxxvi. fig. 8, Colorado, *schistosum*, p. 584, pl. xxxvi. fig. 10, Vera Paz, *deppii*, p. 584, pl. xxxvi. fig. 11, Mexico, and *taniatum*, p. 587, pl. xxxvii. fig. 3, Guatemala, spp. nn., *id. l. c.*

Homalocranion lineatum, sp. n., Fischer, Oster-Progr. Akad. Gymn. Hamburg, 1883, p. 6, pl., figs. 6–9, Venezuela.

Rhabdosoma zebrinum, Jan, described by Bocourt, *l. c.* p. 539, pl. xxxiv. fig. 1.

Rhabdosoma maculatum, sp. n., *id. l. c.* p. 539, pls. xxxiv. fig. 2, & xxxv. fig. 1, Ecuador.

Geophis hoffmanni, Peters, p. 529, pl. xxxi. fig. 8, *chalybeus*, Wagl., p. 530, fig. 11, *rhodogaster*, Cope, p. 531, fig. 12, *dubius*, Peters, p. 532, fig. 9, *rostralis*, Jan, p. 533, fig. 10, and *semidoliatus*, D. & B., p. 534, fig. 7, described by Bocourt, *l. c.*

Geophis dugesi, sp. n., *id. l. c.* p. 573, pl. xxxvii. fig. 1, Mexico.

Geophis latifrontalis, sp. n., Garman, *l. c.* p. 103, Mexico.

Scolecophis atricinctus, Schleg., described by Bocourt, *l. c.* p. 577, pl. xxxvii. fig. 2.

Chersodromus liebmanni, Reinh., described; *id. l. c.* pl. xxxiv. fig. 8.

Lamprosoma occipitale, Hall., p. 558, pl. xxxiv. fig. 6, and *episcopum*, Kenn., p. 559, fig. 4, described; *id. l. c.*

Arrhyton taniatum, Gthr., described; *id. l. c.* p. 568, pl. xxxiv. fig. 7.

Sympholis lippiens, Cope, described; *id. l. c.* p. 555, pl. xxxiv. fig. 5.

Cryptodacus vittatus, Gundl., fig. 7, and *redimitus*, Cope, fig. 8, described *id. l. c.* p. 561, pl. xxxv.

Streptophorus bifasciatus, D. & B., p. 545, pl. xxxii. fig. 10, and *la[illegible]bergi*, Schleg., p. 551, pl. xxxii. fig. 9, described and figured; *id. l. c.*

Streptophorus sebæ, D. & B., p. 546, pls. xxxii. fig. 7, & xxxiii. fig. 1, and *maculatus*, Peters, p. 548, pls. xxxii. fig. 8, & xxxiii. figs. 2–4, described and figured from life; *id. l. c.*

Streptophorus labiosus, sp. n., Bocourt, Miss. Sci Mex. p. 550, pl. xxxii. fig. 6, Guatemala.

Contia pygæa, Cope, pl. vii. fig. 5, and *episcopa*, Kenn., pl. vi. fig. 2, figured by Garman, Mem. Mus. C. Z. ii.

Contia mitis, B. & G., described by Bocourt, *l. c.* p. 557, pl. xxxiv. fig. 3.

Conopsis nasus, Gthr., p. 563, pl. xxxv. fig. 2, *maculatus*, Jan, p. 564, fig. 3, *lineatus*, Kenn., p. 565, fig. 4, and *varians*, Jan, p. 566, fig. 5, described; *id. l. c.*

Enulius murinus, Cope, described; *id. l. c.* p. 537, pl. xxxv. fig. 9.

Enulius sumichrasti, sp. n., *id. l. c.* p. 538, pl. xxxi. fig. 6, Tehuantepec.

Ficimia olivacea, Gray, described; *id. l. c.* p. 570, pl. xxxv. fig. 11.

Ficimia ornata, sp. n., *id. l. c.* p. 571, pl. xxxv. fig. 10, Mexico.

Pseudoficimia, g. n., near *Ficimia*; id. *l. c.* p. 572. For *P. pulchra*, sp. n., *id. ibid.* pl. xxxv. fig. 12, Mexico.

Sphenocalamus, g. n., distinguished from *Prosymna*, Gray, by the divided nasal and absence of loreal; *S. lineolatus*, sp. n., Fischer, Oster-Progr. Akad. Gymn. Hamburg, 1883, p. 5, pl., figs. 3–5, Mazatlan.

Homalosoma coronella, Jan., described and figured by Lortet, Arch. Mus. Lyon, iii. p. 184, pl. xix. fig. 3.

Micrelaps muelleri, Böttg., described and figured; *id. l. c.* p. 184, pl. xix. fig. 2.

Simotes forbesi, sp. n., Boulenger, P. Z. S. 1883, p. 387, pl. xlii., Timor Laut.

Simotes sp. (*vertebralis*, Gthr.?) diagnosed by Böttger, Ber. offenb. Ver. 1883, p. 153, N. Sumatra.

Heterodon platyrrhinus, Latr., fig. 5, *simus*, L., fig. 4, and *nasicus*, B. & G., fig. 6, figured by Garman, *l. c.* pl. vi.

Diadophis punctatus, L., figured; *id. l. c.* pl. ii. fig. 2.

Cemophora coccinea, Blum., described by Bocourt, *l. c.* p. 567, pl. xxxv. fig. 6; figured by Garman, *l. c.* pl. vi. fig. 1.

Ophibolus doliatus, fig. 2, *triangulus*, fig. 1, *getulus*, fig. 3, and *sayi*, fig. 4, figured; *id. l. c.* pl. v.

Macroprotodon mauritanicus, Ptrs., = *Coronella cucullata* var. *brevis*, Gthr.; Böttger, Abh. senck. Ges. xiii. p. 96.

Coronella (*Mizodon*) *regularis*, Fisch. Note by Fischer, Oster-Progr. Akad. Gymn. Hamburg, 1883, p. 15.

Rhinechis amaliæ, Böttg., figured by Böttger, Abh. senck. Ges. xiii. pl. i. fig. 1.

Pityophis intermedius, sp. n., Böttger, Ber. offenb. Ver. 1883, p. 148, Mexico.

Coluber constrictor, L., figured by Garman, *l. c.* pl. iv. fig. 3.

Elaphis obsoletus, Say, fig. 2, and *guttatus*, L., fig. 1, figured; *id. l. c.*

as n *l.*

imenis dahli, Fitz., described and figured by Lortet, *l. c.* p. 185, xix. fig. 4.

Cyclophis vernalis, Dekay, fig. 4, and *æstivus*, L., fig. 1, figured; Garman, *l. c.* pl. iii.

Leptophis frenatus, sp. n., Fischer, Oster-Progr. Akad. Gymn. Hamburg, 1883, p. 8, pl., figs. 9–11.

Eutænia biscutata, sp. n., Cope, P. Ac. Philad. 1883, p. 21, Oregon.

Eutænia vagrans plutonia, subsp. n., Yarrow, P. U. S. Nat. Mus. vi. p. 152, Arizona.

Eutænia henshawi, sp. n., *id. ibid.*, Washington.

Tropidonotus saurita, L., pl. iii. fig. 2, *sirtalis*, L., pl. iii. fig. 3, *sipedon*, L., pl. ii. fig. 3, *cyclopion*, D. B., pl. ii. fig. 4, *leberis*, L., pl. ii. fig. 1, *kirtlandi*, Kenn., pl. i. fig. 3, *occipitimaculatus*, Stor., pl. i. fig. 2, *dekayi*, Holbr., pl. i. fig. 1, and *lineatus*, Hallow., pl. i. fig. 4, figured by Garman, Mem. Mus. C. Z. ii.

Tropidonotus compressicaudus walkeri, subsp. n., Yarrow, *l. c.* p. 154, Florida.

Tropidonotus viperinus. Additional notes on its distribution in Italy; De Betta, Atti Ist. Venet. (7) i. p. 934.

Tropidonotus dendrophiops, sp. n., Günther, Ann. N. H. (5) xi. p. 136, fig., Zamboanga, Philippines.

Atomarchus, g. n., related to *Tropidonotus*, Cope, Am. Nat. xvii. p. 1300; *A. multimaculatus*, sp. n., *id. ibid.*, New Mexico.

Hydrops abacurus, Holbr., figured by Garman, *l. c.* pl. i. fig. 5.

Helicops alleni, Garm., figured; *id. l. c.* pl. vii. fig. 4.

Helicops marginatus, sp. n., Fischer, Oster-Progr. Akad. Gymn. Hamburg, 1883, p. 11, hab. ?.

Bascanium flagelliforme bicinctum, subsp. n., Yarrow, *l. c.* p. 153, Texas.

Psammophylax rhombeatus var. n. *trilineata*, Böttger, Ber. offenb. Ver. 1883, p. 156, Transvaal.

Dipsas aruanus, sp. n., Günther, *l. c.* p. 137, Wokau, Aru Islands.

Elapidæ.

Elaps fulvius, L., figured by Garman, Mem. Mus. C. Z. ii. pl. viii. fig. 3. On the dangerous or fatal effects of the bite of the North American Coral Snakes; True, Am. Nat. xvii. pp. 26–31.

Dinodipsas, Peters. Remarks by Cope, who states that this genus enters his family *Causidæ*, established in 1859 for *Causus*, and therefore anterior to Peters' "Vipernattern"; P. Ac. Philad. 1883, p. 57.

Viperidæ.

Vipera berus, L. R. Finckh writes on the occurrence of the common Viper in Germany, especially on its extraordinary abundance in some places during the year 1882; JH. Ver. Württ. xxxix. pp. 309–314.

Vipera aspis var. *hugii*, Schinz. Remarks by De Betta, Atti Ist. Venet. (7) i. p. 935.

Crotalus confluentus var. n. *pulverulentus*, Cope, P. Ac. Philad. 1883, p. 11, Lake Valley, New Mexico.

Crotalus lepidus, Kenn. Additional notes; *id. ibid.* p. 13.

Crotalus horridus, L., fig. 1, and *catenatus*, fig. 2, figured by Garman, *l. c.* pl. ix.

Crotalus exsul, sp. n., Garman, Mem. Mus. C. Z. ii. p. 114, Lower California.

Sistrurus, g. n., for *Caudisona*, Fitz., *nec* Laur.; *id. l. c.* p. 176.

Agcistrodon contortrix, fig. 1, and *piscivorus*, fig. 2, figured; *id. l. c.* pl. viii. Field-notes by R. E. Kunzé, Am. Nat. xvii. pp. 1229–1238.

Trigonocephalus asper, sp. n., Garman, *l. c.* p. 124, Isthmus of Darien.

Bothriechis trianguligera, sp. n., Fischer, Oster-Progr. Akad. Gymn. Hamburg, 1883, p. 13, Guatemala.

Incertæ sedis.

Helagras prisciformis, g. & sp. nn. (foss.), Cope, P. Am. Phil. Soc. xx. p. 545, Puerco Eocene. The oldest Serpent known from North America. Its type of vertebra is an approximation to the ordinary Reptilian from which the Ophidian was derived.

BATRACHIA.

Camerano, L. Ricerche intorno alla vita branchiale degli Anfibi. Zool. Anz. vi pp. 685–687.

An abstract of an extensive paper. Recent Batrachians sprang without doubt phylogenetically from the Fishes, and are normally caducibranchiate in the adult state. A certain number have been compelled, through adaptation to aquatic life, to return to a more simple organization. In certain species, adaptation has rendered the branchiate form prevalent in the adult state, or even permanent, as, for instance, in *Proteus*. A Batrachian must be regarded as adult as soon as the maturity of the reproductory organs is attained, without regard to the presence or absence of gills; and such species as present themselves in the adult state as either gill-breathers or lung-breathers must be regarded as exhibiting a case of dimorphism through adaptation to local conditions.

——. Intorno alla Neotenia ed allo Sviluppo degli Anfibi. Atti Acc. Tor. xix. pp. 84–93.

Chatin, J. Recherches pour servir à l'histoire du noyau dans l'épithélium auditif des Batraciens. Paris: 1883, 4to, 30 pp., 2 pls.

[Not seen by Recorder.]

Pflüger, E. Die Bastardzeugung bei den Batracheirn. Arch. ges. Phys. xxix. [1882] pp. 48–75, pl. i.

Experiments of crossing *Rana temporaria* with *Molge alpestris* and *[illegible]ris*, *Bufo vulgaris*, *Rana esculenta*, and the various species of Newts one another. The latter attempt proved negative. Ova of *Molge [illegible]garis* and *alpestris* fecundated by *R. temporaria* showed irregular segmentation, while the reversed experiment proved wholly negative. The semen of the Frog acted on the ovum of the Toad, while the Toad-semen had no effect on the Frog-ovum.

——. Versuche der Befruchtung überreifer Eier. *L. c.* pp. 76 & 77.

[Pflüger, E.] Ueber den Einfluss der Schwerkraft auf die Theilung der Zellen und auf die Entwicklung des Embryo. Arch. ges. Phys. xxxii. pp. 1–79, pls. i. & ii.

Schultze, O. Beitrag zur Entwicklungsgeschichte der Batrachier. Arch. mikr. Anat. xxiii. pp. 1–22, pl. i.

Trinchese, S. Sulla terminazione dei nervi nei muscoli degli Anfibi. Rend. Acc. Nap. xxii. p. 277.

ECAUDATA.

Albrecht, P. Note sur le basioccipital des Batraciens anoures. Bull. Mus. Belg. ii. pp. 195–200, pl. viii. figs. 3 & 4.

Born, G. Beiträge zur Bastardirung zwischen den einheimischen Anurenarten. Arch. ges. Phys. xxxii. pp. 453–518.

Numerous experiments of crossing the various tailless Batrachians of North Germany. Hybrids between *Rana temporaria* and *arvalis*, and between *Bufo vulgaris* and *viridis*, attained transformation.

Bouillot, J. Sur l'épithélium sécréteur du rein des Batraciens. C. R. xcvii. pp. 916–918.

Brunn, A. v. Flimmerepithel in den Gallengängen des Frosches. Zool. Anz. vi. p. 483.

Calmels, G. Étude histologique des glandes à venin du Crapaud, et recherches sur les modifications apportées dans leur évolution normale par l'excitation électrique de l'animal. Arch. Physiol. (3) i. pp. 321–362, pl. viii.

Canini, A. Die Endigungen der Nerven in der Haut des Froschlarvenschwanzes. Arch. Anat. Phys. (Phys.) 1883, pp. 149–189, pl. iii.

Engelmann, T. W. Der Bulbus aortæ des Froschherzens. Physiologisch untersucht in Gemeinschaft mit J. Hartog und J. J. W. Verhoeff. Arch. ges. Phys. xxix. [1882] pp. 425–468, pl. v.

Héron-Royer, —. Note sur l'hybridation des Batraciens anoures et ses produits congénères et bigénères. Bull. Soc. Zool. viii. pp. 397–416.

The author records successful attempts of crossing between *Rana temporaria* and *Pelobates fuscus* [!], and between *Bufo vulgaris* and *calamita*, the hybrids reaching the perfect state, and agreeing with the male parent. He also remarks on the disposition of the ova in *Bombinator* and *Bufo*.

Jourdain, L. Sur le système lymphatique des Têtards de Grenouilles. C. R. xcvi. pp. 271–273.

Pflüger, E. Hat die Concentration des Samens einen Einfluss auf Geschlecht? Arch. ges. Phys. xxix. [1882] pp. 1–12.

The concentration of the semen has no influence on the sex.

——. Ueber die das Geschlecht bestimmenden Ursachen und die Geschlechtsverhältnisse der Frösche. *L. c.* pp. 13–40.

Both sexes are absolutely equally represented.

[Pflüger, E.] Ueber die parthenogenetische Furchung der Eier der Amphibien. Arch. ges. Phys. xxix. [1882] pp. 40–44.

No segmentation of the Batrachian ovum can take place without fecundation.

——. Wirkt der Saft der Hoden nicht brünstiger Männchen befruchtend? *L. c.* pp. 44–48.

The fecundating power of the seminal gland of the Frog decreases strongly after the breeding season, but is preserved certainly over a month.

——. Das Ueberwintern der Kaulquappen der Knoblauchkröte. Ein Beitrag zur Lehre von der Anpassung der Organismen an die äusseren Lebensbedingungen und zur Diagnose der Batrachierlarven. *Op. cit.* xxxi. pp. 134–145.

Besides the record of a case of hibernation of larvæ of *Pelobates fuscus*, with remarks on the adaptation of Batrachians to a colder climate by means of larval hibernation, this contribution contains the distinctive characters of the tadpoles of *Pelobates fuscus*, *Bombinator igneus*, *Alytes obstetricans*, and *Rana esculenta*.

——, & Smith, W. J. Untersuchungen über Bastardirung der anuren Batrachier und die Principien der Zeugung. I. Thiel. Experimente über Bastardirung der anuren Batrachier. *Op. cit.* xxxii. pp. 519–541.

Crossing different local forms of *Rana temporaria* and *R. esculenta*, *R. temporaria* and *R. arvalis*, *R. arvalis* and *R. esculenta*, *R. arvalis* and *Bufo vulgaris*, &c. Fecundation of *R. temporaria* by *R. arvalis* had no effect, whereas the reversed process produced a few hybrids which fully developed.

——. Untersuchungen, &c. II. Thiel. Zusammenstellung der Ergebnisse und Erörterung der Principien der Zeugung. *L. c.* pp. 542–580.

The author sums up the results of his and Born's experiments. The specific distinction of *Rana temporaria* and *arvalis* is again proved. Reciprocity in hybrid fecundation is proved, but it is not the rule.

Pohl-Pincus, —. Über die Muskelfasern des Froschherzens. Arch. Anat. Phys. (Phys.) 1883, pp. 272 & 273.

Roux, W. Ueber die Zeit der Bestimmung der Hauptrichtungen des Froschembryo. Eine biologische Untersuchung. Leipzig: 1883, 8vo, 28 pp.

Wedenskii, N. Notiz zur Nervenphysiologie der Kröte. Arch. Anat. Phys. (Phys.) 1883, pp. 310–312.

Ranidæ.

Rana septentrionalis, Bd. (= *R. circulosa*, Rice & Davis), described by Boulenger, Ann. N. H. (5) xi. p. 16.

Rana inguinalis, Gthr., = *Limnodytes madagascariensis*, A. Dum.; *id. l. c.* p. 17.

Rana esculenta. On cases of polymely; De Betta, Atti Ist. Venet. (7) i. p. 940.

Rana arvalis, Nilss. Pflüger & Smith (Arch. ges. Phys. xxxii. p. 525) discuss the distinctive characters of this species, which they prove to be quite distinct; and the latter author (*l. c.* p. 581, pls. vii. & viii.) has a paper in which he shows that the differences in the vomerine dentition which have hitherto been relied upon do not hold good.

Rana pachyderma, sp. n., Cope, P. Ac. Philad. 1883, p. 25, N. California.

Rana forreri and *pustulosa*, spp. nn., Boulenger, Ann. N. H. (5) xi. p. 343, Mexico.

Rana macularia var. n. *javanica*, Horst, Notes Leyd. Mus. v. p. 243, Java. [Doubtless a species.—Rec.]

Rhacophorus lateralis, sp. n., Boulenger, Ann. N. H. (5) xii. p. 162, Malabar.

Rappia burtoni, sp. n., *id. l. c.* p. 163, Gold Coast.

Megalixalus tricolor, sp. n., Böttger, Zool. Anz. iv. [1881] p. 650, Nossi Bé [omitted from Zool. Rec. xviii.].

Engystomatidæ.

Hypopachus oxyrrhinus, sp. n., Boulenger, Ann. N. H. (5) xi. p. 344, Presidio, W. Mexico.

Callula frontifasciata, sp. n., Horst, Notes Leyd. Mus. v. p. 243, Salawatty, Morotai, & Halmaheira.

Scaphiophryne spinosa, Steind., = *S. marmorata*, Blgr.; Boulenger, *l. c.* p. 17.

Dyscophidæ.

Mantipus, g. n., Peters, SB. Ak. Berl. 1883, p. 165; *M. hildebrandti*, sp. n., *id. l. c.* p. 166, Madagascar.

Phryn[illegible]ocara, g. n., *id. l. c.* p. 166; *P. tuberatum*, id. *l. c.* p. 167, Madagascar.

Cystignathidæ.

Pseudis mantidactyla, Cope. Note by Boulenger, Ann. N. H. (5) xi. p. 17.

Pseudis fusca, sp. n., Garman, Science Observer, iv. p. 47, Rio Arassuahy, Brazil. Probably the adult stage of *Batrachichthys* of Pizarro.

Hylodes augusti, Dugès, fig. 1, and *bocourti*, Brocchi, fig. 2, figured by Brocchi, Miss. Sc. Mex. *Batr.* pl. xvi.

Paludicola gracilis, sp. n. (= *Gomphobates notatus*, Hens., *nec* Rhein. & Lütk.), Boulenger, *l. c.* p. 17, Rio Grande do Sul.

Bufonidæ.

Bufo borbonicus, Boie. According to Horst, Notes Leyd. Mus. v. p. 235, *B. cruentatus*, Schleg., and *borbonicus* are distinct species; the type specimens are described, p. 236.

Bufo calamita. On its absence from Italy; De Betta, Atti Ist. Venet. (7) i. p. 941.

Bufo mauritanicus, Schleg. On its habits in captivity; J. v. Fischer, Zool. Gart. xxiv. pp. 43–45.

Bufo bocourti, Brocchi, fig. 1, and *punctatus*, B. & G., figured by Brocchi, Miss. Sc. Mex. *Batr.* pl. vii.

Bufo punctatus, Bd. & Gir. (= *B. beldingi*, Yarrow), described by Boulenger, Ann. N. H. (5) xi. p. 19.

Bufo formosus, Boulenger, P. Z. S. 1883, p. 140, pl. xxiii., Japan, and *andersoni*, id. Ann. N. H. (5) xii. p. 163, N.W. India, spp. nn.

Hylidæ.

Hyla cærulea, White. On its habits in captivity; J. v. Fischer, Zool. Gart. xxiv. pp. 21–25.

Hyla amboinensis, p. 239, Amboyna and Misol, *genimaculata*, p. 240, Gebeh (Gagy ?), *bernsteini*, p. 241, Salawatty and Gagy, and *aruensis*, p. 242, Aru and Misol, spp. nn., Horst, Notes Leyd. Mus. v.

Hyla glandulosa, Guatemala, and *macrops*, Solomon Islands, spp. nn., Boulenger, Ann. N. H. (5) xii. p. 164.

Pelobatidæ.

Scaphiopus intermontanus, sp. n., Cope, P. Ac. Philad. 1883, p. 15, Utah.

Discoglossidæ.

Alytes obstetricans, Laur. Pflüger describes the full-grown larva and its later development; Arch. ges. Phys. xxix. [1882] pp. 78–88. Héron-Royer describes the external embryonary characters up to the eclosion of the larva; Bull. Soc. Zool. viii. pp. 417–436, pl. xiii.

Incertæ sedis.

Theloderma leprosa [*-sum*], Tschudi. R. Horst has a note on this Batrachian, which he describes from one of the type specimens (the other, he thinks, should be referred to *Nectophryne* [!]); the author, however, does not give any indication as to the affinities of the genus *Theloderma*: Notes Leyd. Mus. v. p. 237.

CAUDATA.

Capparelli, —. Recherches sur le venin du *Triton cristatus*. Arch. Ital. Biol. iv. pp. 72–80.

as n

D. Cope gives in a synopsis the distinctive characters, taken from structure of the gills, of several branchiate forms of North America; P. Ac. Philad. 1883, p. 24.

Dowdeswell, G. F. Note on a Minute Point in the Structure of the Spermatozoon of the Newt. Q. J. Micr. Sci. xxiii. pp. 336–339.

Rana esculenta. On cases of polymely; De Betta, Atti Ist. Venet. (7) i. p. 940.

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Dowdeswell, G. F. Note on a Minute Point in the Structure of the Spermatozoon of the Newt. Q. J. Micr. Sci. xxiii. pp. 336–339.

Klaussner, F. Das Rückenmark des *Proteus anguinus*: eine histiologische Studie. Abh. bayr. Akad. xiv. pp. 141–174, pls. i. & ii.

J. Kollmann has a paper on hibernation in the larvæ of Frogs and Newts, and on the metamorphoses of the Axolotl; Rec. Zool. Suisse, i. pp. 75–89.

Lampert, K. Zur Genese der Chorda dorsalis beim Axolotl. Inaug.-Diss. Erlangen, 1883, 8vo, 23 pp., 1 pl.

[Not seen by Recorder.]

Lessona, M. Contributo allo Studio della Pelle degli Urodeli. Mem. Acc. Tor. (2) xxxiv. pp. 125–136, pls. i. & ii.

These researches are based upon *Salamandrina*, *Euproctus*, and *Spelerpes*.

Osborn, H. F. Preliminary Observations upon the Brain of *Amphiuma*. P. Ac. Philad. 1883, pp. 177–185, pl. viii.

Salamandra maculosa, Laur. Bedriaga, Arch. f. Nat. (2) xlix. fig. 245, regards *S. corsica*, Savi, as a slight variety of this species, whereas the Algerian form is stated to be more differentiated, the name var. *algira* being proposed for the latter; the typical form would be called var. *europæa*.

Molge vulgaris, L. Bedriaga makes remarks upon specimens from Greece, originally referred to *M. palmata*, and now believed to represent a new form allied to *M. vulgaris* and *palmata*; Zool. Anz. vi. p. 218. [This form the Recorder has already identified, from a specimen collected by Bedriaga, with *M. vulgaris* var. *meridionalis*.]

Molge montana and *M. rusconii*. Note by De Betta, Atti Ist. Venet. (7) i. p. 944.

Megapterna montana, Savi, extensively described and figured, and its systematic position discussed, by Bedriaga, Arch. f. Nat. (2) xlix. p. 127, pls. iii.–v. *Molge rusconii* and *aspera* also described and discussed in connection with *M. montana*.

Hynobius lichenatus, sp. n., Boulenger, Ann. N. H. (5) xii. p. 165, pl. v. fig. 1, Japan.

Amblystoma tigrinum. M. v. Chauvin has notes on the reproduction of the Axolotl; Zool. Anz. vi. pp. 513–515. Various stages of the Axolotl figured by Brocchi, Miss. Sc. Mex. *Batr.* pls. xvii. & xvii.*bis*.

Amblystoma epixanthum, sp. n., Cope, P. Ac. Philad. 1883, p. 16, Atlanta, Idaho.

Plethodon iecanus [after Mt. Ieka], sp. n., *id. l. c.* p. 24, N. California.

Spelerpes leprosus, Cope, pl. xix. figs. 1 & 2, *belli*, Gray, pl. xx.*bis*, figs. 1–3, *mexicanus*, D. B., pl. xviii.*bis*, figs. 1–4, *salvini*, Gray, pl. xviii. figs. 3 & 4, and *vermicularis*, Gray, pl. xx. fig. 1, figured by Brocchi, *l. c.*

Spelerpes laticeps, p. 110, pl. xviii. fig. 1, Vera Cruz, *bocourti*, p. 1[illegible] pl. xviii. fig. 2, *rostratum*[*-tus*], p. 112, W. Guatemala, *sulcatum*[*-tus*], p. 112, pl. xx. fig. 2, Mexico, *punctatum*[*-tus*], p. 115, Mexico, *attitlanensis*, p. 115, pl. xix. figs. 3 & 4, Attitlan, and *mu*[*c*]*lleri*, p. 116, pl. xx. figs. 3–5, Vera Paz, spp. nn., *id. l. c.*

Spelerpes peruvianus, sp. n., Boulenger, Ann. N. H. (5) xii. p. 165, pl. v. fig. 2, Moyobamba.

Megalobatrachus maximus. Note on its habits by B. G. Wilder, P. Am. Ass. xxi. p. 482.

Amphiuma tridactyla. An account of its habits in captivity, with observations on its anatomy; R. W. Shufeldt, Science, i. pp. 152–163, woodcuts.

Proteus anguinus. An extensive paper on the habits and reproduction of this Batrachian, by Marie v. Chauvin, Z. wiss. Zool. xxxviii. pp. 671–685, pl. xxxviii.

APODA.

The Recorder gives a synopsis of the 14 genera of *Apoda*; Ann. N. H. (5) xii. p. 167.

Epicrionops, g. n., distinguished from *Ichthyophis* by the structure of the tentacle and the separated squamosal and parietal bones; for *E. bicolor*, sp. n., Boulenger, Ann. N. H. (5) xi. pp. 202 & 203, Ecuador.

Cryptopsophis, g. n., distinguished from *Dermophis* by the absence of a second row of mandibular teeth; for *C. multiplicatus*, sp. n., *id. op. cit.* xii. p. 166, Seychelles.

Cæcilia ochrocephala, Cope, figured by Brocchi, Miss. Sc. Mex. *Batr.* pl. xxi. fig. 1.

Dermophis mexicanus, D. B., figured; *id. l. c.* fig. 2.

Scolecomorphus, g. n., distinguished from *Gegenophis* by having the squamosal bones in contact with the parietals, two series of teeth in the lower jaw, and by the structure of the tentacle; for *S. kirki*, sp. n., Boulenger, Ann. N. H. (5) xi. p. 48, Interior of E. Africa.

STEGOCEPHALA.

Cope, E. D. Third Contribution to the History of the *Vertebrata* of the Permian Formation of Texas. P. Am. Phil. Soc. xx. pp. 447–461.

Several new genera and species of *Stegocephala* are established.

Credner, H. Die Stegocephalen aus dem Rothliegenden des Plauen-'schen Grundes bei Dresden. iv. Theil. Z. geol. Ges. xxxv. pp. 275–300, pls. xi. & xii.

Fritsch, A. Fauna der Gaskohle und der Kalksteine der Permformation Böhmens. i. Prag: 4to.

The fourth fascicle (pp. 159–182, pls. xxxvii.–xlviii.), concluding the first volume, was issued in 1883. It is devoted to the families *Hylonomidæ* and *Microbrachidæ*, the following genera and species being described as n[illegible]—

[illegible] g. n.; *S. pusilla*, sp. n., p. 165.

[illegible]*odon*, g. n., p. 167; *R. copii*, p. 168, *dispersus*, p. 170, *trachytem*. 170, spp. nn.

Microbrachis? branchiophorus, sp. n., p. 181.

Stelliosaurus, Fritsch, 1879, is changed to *Hyloplesion*.

GAUDRY, A. Les enchaînements du monde animal dans les temps géologiques. Fossiles primaires. Paris : 1883, 8vo.

Pp. 251–288 and numerous woodcuts are devoted to the *Batrachia Stegocephala*. Reproduced in Arch. Z. expér. (2) i. pp. 1–30, pls. i.–vii.

R. LYDEKKER has notes on some Gondwána Labyrinthodonts; Rec. Geol. Surv. Ind. xv. [1882] pp. 24–28.

Branchiosaurus gracilis, Credn., is the larva of *B. amblystomus*, Credn.; there is no evidence of its being identical with *Protriton petrolei*, Gaudry, as stated by Steinitz & Deichmüller: Credner, *l. c.* p. 275.

Acanthostoma vorax, Credn. (= *Melanerpeton spiniceps*, Gein. & Deichm.), extensively described and figured; *id. l. c.* p. 277, pls. xi. figs. 1–9, & xii. figs. 1 & 2.

Melanerpeton spiniceps, Credn., described and figured; *id. l. c.* p. 289, pl. xii. figs. 3–5.

Discosaurus, g. n. (*Limnerpetid.*), for *D. permianus*, sp. n., *id. l. c.* p. 294, pl. xii. figs. 6–10.

Pachygonia incurvata, Huxley. Mandible figured by Lydekker, *l. c.* pl., figs. 2–4.

Gonioglyptus huxleyi, sp. n., *id. l. c.* p. 26, pl., fig. 5, Panchet Group, Gondwána Rocks.

Glyptognathus fragilis, g. &. sp. nn., for fragment of mandible from the Panchet Rocks, *id. l. c.* p. 27, pl., fig. 1.

Trimerorrhachis bilobatus, sp. n., Cope, P. Am. Phil. Soc. xx. p. 629, Permian of Texas.

Edaphosaurus, g. n., apparently allied to *Pantylus*, with which, and perhaps also *Helodectes*, it forms a new family, *Edaphosauridæ*, distinguished from *Clepsydropidæ* by the presence of more than one series of teeth on parts of the jaws; *id. l. c.* p. 448. *E. pogonias*, sp. n., *id. l. c.* p. 449, Permian of Texas.

Pariotichus megalops, sp. n., *id. l. c.* p. 630, Permian of Texas. *Pariotichus*, *Pantylus*, and probably *Ectocynodon*, must be referred to a special family, the *Pariotichidæ*, which has teeth like the *Edaphosauridæ*, but differs from it in the entire over-roofing of the temporal forsa.

Ectocynodon aguti, sp. n., *id. l. c.* p. 451, Permian of Texas.

Diplocaulus, Cope. Genus recharacterized, *id. ibid.*, and a species added, *D. magnicornis*, sp. n., p. 453, Permian of Texas.

Acheloma, g. n., differing from *Eryops* in the absence of notch of the posterior border of the skull between the epiotic and quadrate or squamosal bones, and in the absence of condyles of the humerus; *id. l. c.* p. 455. *A. cumminsi*, sp. n., *id. l. c.* p. 456, Permian of Texas.

Anisodexis, g. n., differing from all other *Eryopidæ* in the great and abrupt inequality of the teeth of the external series of the mouth; *id. l. c.* p. 459. *A. imbricatus*, sp. n., *id. ibid.*, Permian of Texas. The author appends a list of the known species of the family *Eryopidæ*.

PISCES.

BY

G. A. Boulenger and W. R. Ogilvie-Grant.

PHYSIOLOGICAL, ANATOMICAL, AND GENERAL.

Abbott, C. C. The Intelligence of Fish. Science, i. pp. 327 & 328.

Babuchin, —. Zur Begrundung des Satzes von der Præformation der elektrischen Elemente im Organ der Zitterfische. Arch. Anat. Phys. (Phys.) 1883, pp. 239–254 (with woodcuts).

Bambeke, C. van. Contributions à l'histoire de la constitution de l'œuf. I. Rapport médiat de la vésicule germinative avec la périphérie du vitellus. Arch. biol. iv. pp. 803–831, pl. xxvii.

Contains researches on the ova of *Teleostei*.

Baudelot, E. Recherches sur le système nerveux des poissons, avec 10 pls. Ouvrage précédé d'un avertissement par M. Em. Blanchard. Paris : 1883, fol. (xii. 178 pp.).

[Not seen by Recorder.]

Blanchard, R. Sur les Fonctions des Appendices Pyloriques. Bull. Soc. Zool. viii. pp. 143–146.

Canestrini, R., & Parmigiani, L. Gli Otoliti dei Pesci. Atti Soc. Pad. viii. pp. 280–339, pls. xvi. & xvii.

Cattie, J. T. Ueber das Gewebe der Epiphyse von Plagiostomen, Ganoiden und Teleostier zur Vertheidigung. Z. wiss. Zool. xxxix. pp. 720–722.

Chabry, L. Sur le Mécanisme de la Natation des Poissons. J. de l'Anat. Phys. xix. pp. 582–585 (with woodcuts).

Eisig, H. Ueber das Ruhen der Fische. Kosmos, xii. pp. 438–442.

——. Einfluss der Wassertemperatur auf Fische und Schildkröten. *L. c.* pp. 442 & 443.

Forbes, S. A. The Food of the Smaller Fresh-water Fishes. Bull. Illin. Lab. N. H. vi. pp. 65–94.

In continuation of a paper, *op. cit.* No. 3 [1880] pp. 18–65. 25 American species of 22 genera were examined, and correlations of structure to food characters discussed.

GÖLDI, E. A. Kopfskelet und Schultergürtel von *Loricaria cataphracta*, *Balistes capriscus*, und *Acipenser ruthenus*. Zool. Anz. vi. pp. 420–422.

HOWES, G. B. Zoology and Food Fishes. London: 1883, 8vo, 70 pp. (Handbook Internat. Fish. Ex.).

HUXLEY, T. H. Contributions to Morphology. *Ichthyopsida*, No. 2. On the oviducts of *Osmerus*; with remarks on the relations of the Teleostean with the Ganoid Fishes. P. Z. S. 1883, pp. 132–139, woodcuts.

JORDAN, D. S., & GILBERT, C. H. On certain neglected Generic Names of Lacépède. P. U. S. Nat. Mus. v. pp. 570–576.

LAVOCAT, A. Construction de la ceinture scapulo-claviculaire dans la série des Vertébrés. C.R. xcvii. pp. 1316–1319.

RAUTENFELD, E. v. Morphologische Untersuchungen über das Skelet der hinteren Gliedmassen von Ganoiden und Teleostiern. Dorpat: 1882, 48 pp., 2 pls., and 19 figs. in text.

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REPIACHOFF, W. Bemerkungen über die Keimblätter der Wirbelthiere. Zool. Anz. vi. pp. 148–152.

RYDER, J. A. Observations on the Absorption of the Yelk, the Food, Feeding, and Development of Embryo Fishes, comprising some investigations conducted at the Central Hatching, Armory Building, Washington, D.C., in 1882. Bull. U. S. Fish. Comm. ii. pp. 179–205, woodcut.

STRASSER, —. Über die Ortsbewegung der Fische. JB. schles. Ges. ix. pp. 147–150.

VINCIGUERRA, D. Risultati Ittiologici delle Crociere del 'Violante.' Ann. Mus. Genov. xviii. pp. 465–590, pls. i.–iii.

Notes on or descriptions of 119 species, of which 3 are given as new.

——. Le Crociere dell' Yacht 'Corsaro' del Capitano-Armatore Enrico D'Albertis. III. Pesci. Ann. Mus. Genov. xviii. pp. 607–620.

35 species are recorded, with notes and synonomy.

L. CRIÉ gives extracts from the Ichthyology of Pierre Belon; Rev. Sci. (3) v. pp. 741–745, woodcuts.

On the toxical properties of some Japanese Fish; C. REMY, CR. Soc. Biol. (7) iv. pp. 263–265, and Mém. Soc. Biol. pp. 1–28.

Leitfaden für das Aquarium. Naples: 1883, 4to, *Pisces*, pls. 28–46.

FAUNÆ.

EUROPE.

TILLJEBORG, W. Sveriges och Norges Fiskar. Upsala: 1881, 4to. [Omitted from the Record of 1881.]

Pt. i. Contains descriptions of the species belonging to the families *Percidæ*, *Berycidæ*, *Trachinidæ*, *Cottidæ*, *Sciænidæ*, and *Mullidæ*.

Olsen, O. T. The Piscatorial Atlas of the North Sea, English and St. George's Channels. London : 1883, folio.

Day, F. The Fishes of Great Britain and Ireland.

Pts. vi. & vii. were issued in 1883. Pt. vi. (pp. 97–176, pls. cxvii.–cxxxii.) treats of the *Salmonidæ* (conclusion), *Esocidæ*, *Scombresocidæ*, *Cyprinidæ* (part). Pt. vii. (pp. 177–272, pls. cxxxiii.–cxlviii.) contains *Cyprinidæ* (conclusion), *Clupeidæ*, *Muræniдæ*, *Syngnathidæ*, *Sclerodermi*, and *Gymnodontes* (part).

Kent, W. S. Handbook of the Marine and Freshwater Fishes of the British Islands (including the enumeration of every species). London : 1883, 8vo, 129 pp., woodcuts (Handbook Internat. Fish. Ex.).

Sim, G. Occurrence of Rare Fishes at Aberdeen. Scot. Nat. (2) ii. pp. 55–57.

The fish recorded are *Rhina squatina*, *Phycis blennoides*, *Fierasfer dentatus*, *Labrax lupus*, *Mullus surmuletus*.

Beneden, E. Van. Additions à la Faune Ichthyologique des côtes de Belgique. Bull. Ac. Belg. (3) v. pp. 404–420.

51 species are enumerated.

Seidlitz, G. Fauna Baltica. Die Fische der Ostseeprovinzen. Arch. Nat. Liv. (2) viii. 1882, pp. 1–138.

A list of the literature, with short descriptive notes on the known species.

Möbius, K., & Heincke, F. Die Fische der Ostsee, in Bericht der Commission zur wissenschaftlichen Untersuchung der deutschen Meere in Kiel für die Jahre 1877 bis 1881, vii.–ix. Jahrg. Abth. ii. pp. 197–296.

An account of the Fish-fauna of the Baltic Sea. 110 species are recorded, each of which is illustrated by one or more woodcuts.

Hensen, V. Ueber das Vorkommen und die Menge der Eier einiger Ostseefische, insbesondere derjenigen der Scholle (*Platessa platessa*), der Flunder (*Platessa vulgaris*), und des Dorsches (*Gadus morrhua*, L.). *L. c.* pp. 299–313.

Marion, A. F. Esquisse d'une Topographie Zoologique du Golfe de Marseille. Ann. Mus. Marseille, i.

Contains a list of the Fish-fauna, pp. 99–102.

Steindachner, F. Beiträge zur Kenntniss der Fische der Adria. Anz. Ak. Wien, 1883, pp. 212–214.

3 species are described as new.

Ninni, A. P. Catalogo dei Ghiozzi (*Gobiina*) osservati nell' Adriatico e nelle acque dolci del Veneto. Atti Soc. Mod. (3) i. pp. 221–226.

17 species are recorded, with notes or short descriptions.

Giglioli, E. H. Intorno a due nuovi pesci dal golfo di Napoli. Zool. Anz. vi. pp. 397–400.

Facciolà, L. Pesci nuovi o poco noti dello Stretto di Messina. Nat. Sicil. i. (1882) pp. 166–168, 184–189, 193–198; ii. (1882–3) pp. 25–29, 145–148, 186–188, 205–208, 252–256; iii. (1883) pp. 24–26, 51–54, & 71–75.

Contains notes on or descriptions of 21 species, of which 9 are said to be new to science. A new genus, *Pelopsia*, is also described (ii. p. 145), supposed to be the type of a new family allied to the *Sternoptychidæ* and *Scopelidæ*, but afterwards shown (iii. p. 71) to be the young of *Chlorophthalmus agassizi*, Bp.

Barta, M. A. Materyjaly do Ichthyjologicznej fauny Dniestru i jego dorneczy. Lwów: 1883, 16 pp.

[Not seen by Recorder.]

Asia.

Lortet, L. Poissons et Reptiles du lac de Tibériade et de quelques autres parties de la Syrie. Arch. Mus. Lyon, iii. Fishes, pp. 99–182, pls. vi.–xviii.

39 species are recorded, of which 10 are described as new.

A. Bunge, in a letter to L. v. Schrenck, gives a list of the Fish observed at the Polar Meteorological Station at the mouth of the Lena, which are mostly designated by their Russian names; Bull. Pétersb. xxviii. pp. 517–546.

Steindachner, F., & Döderlein, L. Beiträge zur Kenntniss der Fische Japans. Part i., Denk. Ak. Wien, xlvii. pp. 3–33, pls. i.–vii. Contains *Berycidæ* and *Percidæ* (part). Part ii., *op. cit.* xlviii. pp. 1–38, pls. i.–vii., conclusion of *Percidæ*, *Sparidæ*, *Mullidæ*, *Squamipinnes*, *Hoplognathidæ*, *Teuthididæ*, *Cirrhitidæ*, *Pempheridæ*, *Polynemidæ*, *Embiotocidæ*, *Sciænidæ*, *Sphyrænidæ*, *Trichiuridæ*, and *Acronuridæ*.

94 species are described, of which 15 are new; also 7 new genera.

Sauvage, H. E. Sur une collection de poissons recueillis dans le lac Biwako (Japon) par M. F. Steenackers. Bull. Soc. Philom. (7) vii. pp. 144–150.

32 species are recorded, of which 7 are described as new. 1 new genus is also described.

——. Sur une collection de poissons recueillis dans Mé-Nam (Siam) par M. Harmand. *L. c.* pp. 150–155.

70 species are recorded, of which 5 are described as new.

Vinciguerra, D. Appunti ittiologici sulle collezioni del Museo Civico de Genova. Enumerazione di alcuni pesci raccolti a Minhla sull' Irawaddi dal Cap. Cav. G. B. Comotto. Ann. Mus. Genov. xviii. pp. 651–660.

20 species are recorded, with notes and synonymy.

Day, F. Catalogue of the Exhibits in the Indian Section (Internat. Fish. Ex.). London: 1883, 8vo, 198 pp.

Contains lists of Indian Food Fishes exhibited, pp. 154–198.

GÜNTHER, A. Notes on some Indian Fishes in the Collection of the British Museum. Ann. N. H. (5) xi. pp. 137–140.

Contains descriptions of 3 new species.

AFRICA.

STEINDACHNER, F. Beiträge zur Kenntniss der Fische Afrikas. Part ii. Denk. Ak. Wien, lxv. pp. 1–15, pls. i.–vi.

Notes or descriptions are given of 25 species, 5 of which are described as new.

VINCIGUERRA, D. Spedizione italiana nell' Africa equatoriale. Risultato Zoologici : Pesci d'acqua dolce. Ann. Mus. Genov. xviii. pp. 691–703 (with woodcuts), and Mem. Soc. Geograf. Ital. ii. pt. 3, pp. 3–15.

4 species are recorded, 2 of which are described as new.

AMERICA.

United States Commission of Fish and Fisheries, Commissioner's Report for 1880. Washington : 1883. Contains valuable information about the American Food Fishes. Bull. U. S. Fish Comm. ii. pp. 161–467, and iii. wholly, were also published in 1883, and contain a mass of information on economic subjects.

BEAN, T. H. Catalogue of the Collection of Fishes exhibited by the U. S. National Museum at the International Fisheries Exhibition, London. Washington : 1883, 8vo.

JORDAN, D. S., & GILBERT, C. H. Synopsis of the Fishes of North America. Bull. U. S. Nat. Mus. xvi. pp. 1–1018.

In this work, the authors give concise descriptions with the synonymy of all the species of Fishes known to inhabit the waters of North America, north of the boundary between the United States and Mexico. The classification adopted is based on the views of Gill and Cope. 7 new genera and 17 new species are established.

——, ——. Notes on the Nomenclature of certain North American Fishes. P. U. S. Nat. Mus. vi. p. 110.

SMILEY, C. W. List of papers relating to the work of the U. S. Fish Commission, from its organization in 1871 to July 1st, 1883, and which have been published under the direction of the U. S. Fish Commission, National Museum, and Tenth Census, together with a topical synopsis of the titles. Bull. U. S. Fish Comm. iii. pp. 1–80.

JORDAN, D. S., & GILBERT, C. H. A Review of the American *Carangidæ*. P. U. S. Nat. Mus. vi. pp. 188–207.

6 genera are distinguished : *Megalaspis*, *Decapterus*, *Trach*[*y*]*urus*, *Caranx*, *Selene*, and *Chloroscombrus*. A synopsis and synonymy of the species are given. 1 species is described as new.

BEAN, T. H. List of Fishes known to occur in the Arctic Ocean north of Bering Strait. In Cruise of the Revenue Steamer 'Corwin' in Alaska and the N.W. Arctic Ocean in 1881. Washington: 1883, 4to, pp. 118–120, 2 pls.

21 species recorded, with localities.

STEARNS, W. A. Notes on the Natural History of Labrador. P. U. S. Nat. Mus. vi. Fishes, pp. 123–125.

17 species are recorded.

JORDAN, D. S. Report on the Fishes of Ohio. Rep. Geol. Surv. Ohio, Zool. Bot. iv. pp. 735–1000 [1882].

With descriptions and synonymy.

——, & SWAIN, J. List of Fishes collected in the Clear Fork of the Cumberland, Whitley County, Kentucky, with descriptions of three new species. P. U. S. Nat. Mus. vi. pp. 248–251.

——, & GILBERT, C. H. Notes on a Collection of Fishes from Charleston, South Carolina, with descriptions of three new species. P. U. S. Nat. Mus. v. pp. 580–620.

126 species are recorded, and 1 new genus (*Querimana*) is described.

SMITH, ROSA. Notes on the Fishes of Todos Santos Bay, Lower California. P. U. S. Nat. Mus. vi. pp. 232–236.

JORDAN, D. S., & GILBERT, C. H. List of the Fishes now in the Museum of Yale College, collected by Prof. Frank H. Bradley at Panama, with descriptions of three new species. P. U. S. Nat. Mus. v. pp. 620–632.

A new genus of *Blenniidæ* is also described.

STEINDACHNER, F. Beiträge zur Kenntniss der Flussfische Südamerikas. Part iv. Denk. Ak. Wien, xlvi. pp. 1–44, pls. i.–vii.

I. (pp. 1–16) contains notes on or descriptions of 29 species from Rio Huallaga, Amazon, 6 of which are described as new. II. (pp. 17–26), "Bericht über eine Sammlung von Süsswasserfischen aus dem Rio de Huambo, in dem Zoologischen Museum zu Warschau," contains notes on or descriptions of 9 species, of which 4 are described as new. III. (pp. 26–41), "Uber einige Siluroiden und Characinen von Canelos (Ecuador) und aus dem Amazonen-Strome," contains descriptions or remarks on 24 species, 17 of which are described as new.

AUSTRALIA.

MACLEAY, W. Contribution to a Knowledge of the Fishes of New Guinea. P. Linn. Soc. N. S. W. vii. pp. 224–250, 351–366, & 585–598, & viii. pp. 252–280.

54 species are described as new.

RAMSAY, E. P. Description of some new Australian Fishes. P. Linn. Soc. N. S. W. viii. pp. 177–179.

[Ramsay, E. P.] Catalogue of the Exhibits in the New South Wales Court. London: 1883, 56 pp. (Internat. Fish. Ex.)

Contains notes on and a list of the Food Fishes exhibited.

De Vis, C. W. Descriptions of [2] New Genera and [11] Species of Australian Fishes. P. Linn. Soc. N. S. W. viii. pp. 283–289.

Macleay, W. Notes on a Collection of Fishes from the Burdekin and Mary Rivers, Queensland. P. Linn. Soc. N. S. W. viii. pp. 199–213.

51 species are recorded, 14 of which are described as new.

——. Fishes of the Palmer River. *Op. cit.* vii. pp. 69–71.

PALÆONTOLOGY.

Gaudry, A. Les Enchaînements du Monde Animal dans les temps géologiques. Fossiles primaires. Paris: 1883, 8vo.

Fishes, pp. 218–250, with woodcuts.

Davis, J. W. On the Fossil Fishes of the Carboniferous Limestone Series of Great Britain. [Tr. R. Dublin Soc. (2) i. pp. 327–600, pls. xlii.–lxv.] Dublin: 1883, 4to.

Contains descriptions of 9 new genera and 70 new species, of which 1 genus and 2 species are referred to *Ganoidei*, the rest to *Selachoidei*.

Traquair, R. H. Notice of New Fish Remains from the Blackband Ironstone of Borough Lee, near Edinburgh. Geol. Mag. (2) x. pp. 542–544.

2 species and 1 variety are described as new.

Sauvage, H. E. Note sur les Poissons du Muschelkalk de Pontpierre (Lorraine). Bull. Soc. Géol. (3) xi. pp. 492–496.

A list of 14 species, with notes and references.

Kramberger-Gorjanovic, D. Die Jungtertiäre Fisch-fauna Croatiens, Part ii. Beitr. Österr.-Ung. iii. pp. 65–85, pls. xiii. & xiv.

11 species are described as new, all of which are referred to recent genera. A table is added (p. 82), giving a complete list of the species, and showing in which formation they occur.

——. Bemerkungen zur fossilen Fischfauna der Karpathen. Verh. geol. Reichsanst. 1882, pp. 111–114, and Extract in JB. Mineral. ii. p. 109.

Schlosser, M. Die Fauna des Kelheimer Diceras-Kalkes. Palæontogr. xxviii. *Pisces*, pp. 58–60, pl. viii. figs. 4–7.

Geinitz, H. B. Die sogenannten Koprolithenlager von Helmstedt, Büddenstedt und Schleweke bei Harzburg. Abh. Ges. Isis, 1883, pp. 3–9, pl. i., & pp. 37–45, pl. ii.

Contains notes and figures of 9 species, 1 of which is described as new.

BASSANI, F. Descrizione dei Pesci Fossili di Lesina, accompagnata da appunti su alcune altre Ittiofaune Cretacee. Denk. Ak. Wien, lxv. Abth. 2, pp. 195–288, pls. i.-xvi.

DAMES, W. Ueber eine tertiäre Wirbelthierfauna von der westlichen Insel des Birket-el-Qurûn in Fajum (Aegypten). *Pisces*, pp. 135–153, pl. iii. SB. Ak. Berl. 1883.

Contains notes or descriptions of 16 species, of which 5 are new. 2 new genera are also described.

COPE, E. D. On the Fishes of the Recent and Pliocene Lakes of the Western part of the Great Basin, and of the Idaho Pliocene Lake. P. Ac. Philad. 1883, pp. 134–166.

——. Fourth Contribution to the History of the Permian Formation of Texas. *Pisces*, pp. 628–629. P. Am. Phil. Soc. xx.

1 genus and 2 species are described as new.

WHITEAVES, J. F. Recent Discoveries of Fossil Fishes in the Devonian Rocks of Canada. Am. Nat. xvii. pp. 158–164.

PALÆICHTHYES.

CHONDROPTERYGII.

SELACHOIDEI.

BLANCHARD, R. Glycogène chez les embryons de Squale. Zool. Anz. vi. p. 67 ; Bull. Soc. Zool. Fr. vii. p. 405 ; extract in J. R. Micr. Soc. (2) iii. p. 493.

HERTWIG, O. Die Entwicklung des mittleren Keimblattes der Wirbelthiere. Jen. Z. Nat. xvi.

Elasmobranchii, pp. 287–290.

HOFFMANN, C. K. Sur l'origine du Feuillet Blastodermique moyen chez les Poissons Cartilagineux. Arch. Néerl. xviii. pp. 241–258, pls. iii. & iv.

SCHNEIDER, A. Über die Begattung der Knorpelfische. Zool. Beitr. i. p. 61.

TROIS, E. F. Recherches Expérimentales sur les Spermatozoïdes des Plagiostomes. J. Microgr. vii. pp. 193–196.

VIGNAL, W. Note sur le système ganglionnaire des Poissons Cartilagineux. Arch. Z. expér. (2) i. pp. xvii.–xx.

ST. JOHN, O., & WORTHEN, A. H. Descriptions of Fossil Fishes. A partial revision of the Cochliodonts and Psammodonts; including notices of miscellaneous material acquired from the Carboniferous Formations of the United States. Geol. Surv. Illin. vii. pp. 57–260.

The following new genera and species, &c., are characterized :—

Psephodus obliquus, p. 66, pl. i. figs. 1–5, *P. symmetricus*, p. 71, pl. i.

figs. 6 & 7, *P. latus*, p. 72, pl. ii. figs. 1 & 3, and *P. lunulatus*, p. 74, pl. ii. fig. 4, spp. nn. (foss.), St. John & Worthen, *l. c.*

Psephodus pacenta, Newb. & Wort., redescribed and figured; *iid. l. c.* p. 69.

Teniodus regularis, p. 77, fig. 11, and *T. obliquus*, p. 78, fig. 10, spp. nn. (foss.); *T. fasciatus*, Newb. & Wort., redescribed and figured, p. 76, fig. 9: *iid. l. c.* pl. xiii.

Voticinodus, g. n. (foss.), for *V. vetustus*, p. 82, pl. iii. fig. 1, *V. discrepans*, p. 83, pl. iii. figs. 2 & 3, *V.? simplex*, p. 84, pl. iv. figs. 22–26, *V.? similis*, p. 86, pl. iv. figs. 17–19, *V.? carbonarius*, p. 88, pl. iv. fig. 20, and *V.? lepis*, p. 88, pl. iv. fig. 21, spp. nn., *iid. l. c.*

Deltoptychius primus, p. 93, figs. 6–8, *wachsmuthi*, p. 93, figs. 1–5, *varsoviensis*, p. 96, figs. 14 & 15, *expansus*, p. 98, figs. 9 & 13, spp. nn. (foss.); *D. nitidus*, Leidy, redescribed and figured, p. 99, fig. 16: *iid. l. c.* pl. v.

Stenopterodus, g. n. (foss.), for *S. planus*, p. 102, figs. 9–14, and *elongatus*, p. 106, figs. 1–3, spp. nn., and *S. parvulus*, Newb. & Wort., p. 107, figs. 4–8, and *S.* sp. undet., p. 105, figs. 15 & 16, *iid. l. c.* pl. iv.

Chitonodus, g. n. (foss.), for *C. springeri*, p. 112, figs. 3–15, *antiquus*, 116, fig. 2, *tribulis*, p. 117, pl. vii. figs. 18–21, and *liratus*, p. 119, ..g. 1, *iid. l. c.* pl. vi.

Deltodopsis, g. n. (foss.), for *D. affinis*, p. 160, fig. 1, *D. st. ludovici*, p. 161, figs. 2–6, *D.? convolutus*, p. 165, figs. 11 & 12, *D.? inflexus*, p. 167, fig. 13, *D.? exornatus*, p. 168, fig. 14, spp. nn., *iid. l. c.* pl. ix.

Deltodopsis augustus, Newb. & Wort. (foss.), described and figured; *iid. l. c.* p. 163, pl. ix. figs. 7–10.

Cochliodus vanhorni, p. 120, figs. 1–10, *C. obliquus*, p. 126, fig. 17, *C. leidii*, p. 127, figs. 11–16, pl. vii., *C.? bialveatus*, fig. 15, *C.? keokuk*, fig. 16, and *C.? convexus*, figs. 17 & 18, p. 169, pl. xi., spp. nn. (foss.), *iid. l. c.*

Tomodus? limitaris, sp. n., *iid. l. c.* p. 173, pl. xiii. fig. 12.

Xystrodus simplex, p. 178, figs. 4 & 5, *incondítus*, p. 179, fig. 1, *imitatus*, p. 180, fig. 2, *verus*, p. 181, figs. 6 & 7, *bellulus*, p. 183, fig. 3, spp. nn. (foss.), *iid. l. c.* pl. viii.

Sandalodus complanatus, Newb. & Wort., p. 184, figs. 1–4, *lævissimus*, Newb. & Wort., p. 186, figs. 8 & 9, *S.* sp. ?, p. 187, figs. 5 & 6, and *spatulatus*, Newb. & Wort., p. 188, fig. 7 (foss.), described and figured; *iid. l. c.* pl. xii.

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Pœcilodus varsoviensis, p. 131, figs. 13 & 14, *st. ludovici*, p. 132, figs. 8 & 12, *cestriensis*, p. 135, figs. 15–17, *wortheni*, p. 136, fig. 18, *springeri*, p. 136, fig. 19, and *carbonarius*, p. 139, figs. 20 & 21, spp. nn. (foss.), *iid. l. c.* pl. viii.

Deltodus latior, p. 145, figs. 11 & 12, *cinctulus*, p. 146, figs. 6 & 7, *trilobus*, p. 148, fig. 8, *parvus*, p. 151, figs. 1–5, *intermedius*, p. 153, figs. 14 & 15, pl. ix., *powelli*, p. 154, fig. 1, *propinquus*, p. 156, figs. 3 & 4, pl. x., spp. nn. (foss.), *iid. l. c.*

Deltodus occidentalis, Leidy, redescribed and figured; St. John & Worthen, *l. c.* p. 150, pl. ix. figs. 9 & 10.

Psammodus angularis, Newb. & Wort., p. 222, pl. xix. figs. 1 & 2, and *reticulatus*, Newb. & Wort., p. 224, pl. xix. figs. 3–5, described and figured; *iid. l. c.*

Psammodus springeri, p. 202, pl. xx. figs. 4–11 (and woodcuts), *tumidus*, p. 205, pl. xiv. figs. 1–4, *turgidus*, p. 206, pl. xv. fig. 4 (and woodcut), *lovianus*, p. 207, pl. xiv. figs. 7–9, *glyptus*, p 209, pl. xiv. figs. 5 & 6, *grandis*, p. 211, pl. xv. figs. 1–3, *plenus*, p. 213, pls. xvi. figs. 1–4, & xvii. figs. 1–4, *cælatus*, p. 217, pl. xviii. fig. 1, and *crassidens*, p. 218, pl. xviii. figs. 2–6 (and woodcut), spp. nn. (foss.), *iid. l. c.*

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Ctenacanthus gracillimus, Newb. & Wort., described and figured; *iid. l. c.* p. 238, pl. xxiv. fig. 1.

Ctenacanthus coxianus, p. 223, pl. xxi. fig. 1, *deflexus*, p. 234, pl. xxii. fig. 1, *harrisoni*, p. 236, pl. xxiii. fig. 1, *pellensis*, p. 237, pl. xxi. fig. 2, *canaliculatus*, p. 239, pl. xxi. fig. 3, and *buttersi*, p. 240, pl. xxii. fig. 2, spp. nn. (foss.), *iid. l. c.*

Acondylacanthus, g. n., for *A. rectus*, p. 241, fig. 2, *A. nuperus*, p. 242, fig. 3, *A.? mudgianus*, pl. xxiv. fig. 3, and *A.? xiphias*, fig. 1, p. 244, spp. nn. (foss.), *iid. l. c.* pl. xxvi.

Eunemacanthus, g. n. (foss.), for *Ctenacanthus costatus*, Newb. & Wort., described and figured, *iid. l. c.* p. 246, pl. xxiii. fig. 2.

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Physonemus falcatus, sp. n. (foss.), *iid. l. c.* p. 252, pl. xxiv. fig. 6.

Drepanacanthus reversus, St. J. & W. (foss.), described and figured; *iid. l. c.* p. 253, pl. xxiv. fig. 5.

Batacanthus necis, sp. n. (foss.), *iid. l. c.* p. 253, pl. xxv. fig. 4.

Oracanthus retustus, Leidy (foss.), described and figured; *iid. l. c.* p. 255, pl. xxiv. fig. 2.

Oracanthus rectus, sp. n. (foss.), *iid. l. c.* p. 257, pl. xxv. fig. 3.

Pnigeacanthus, g. n. (foss.), for *P. trigonalis*, sp. n., *iid. l. c.* p. 259, pl. xxiv. fig. 4.

Tristychius, Agass. (foss.). On the structure and affinities of this genus; Stock, Ann. N. H. (5) xii. pp. 170–190, pl. vii.

Tristychius fimbriatus, sp. n., *id. l. c.* p. 177, pl. vii. fig. 1, Carboniferous at Gilmerton, near Edinburgh.

Gyracanthus nobilis, p. 542, and *youngi*, p. 543, spp. nn. (foss.), Traquair, Geol. Mag. (2) x., Black Band Ironstone of Borough Lee, near Edinburgh.

Gyracanthus tuberculatus. Notes by Stock, Tr. Edinb. Nat. Club, i. p. 50.

Carcharias murrayi, sp. n., Günther, Ann. N. H. (5) xi. p. 137, Kurrachee.

Carcharias (*Prionodon*) *falciformis*, M. & H. Note by Steindachner, Denk. Ak. Wien, lxv. p. 14.

Carcharias (*Aprionodon*) *frequens*, sp. n. (foss.), Dames, SB. Ak. Berl. 1883, p. 143, Tertiary of the Island of Birket-el-Qurûn.

Galeocerdo rayneri, MacD. & Barr. Note on the brain of this species; Haswell, P. Linn. Soc. N. S. W. vii. pp. 210 & 211.

Galeocerdo latidens, Ag. (foss.), described by Dames, *l. c.* p. 142, Tertiary of the Island of Birket-el-Qurûn.

Galeorrhinus zyopterus, sp. n., Jordan & Gilbert, Syn. Fish. N. Am. p. 871, Coast of S. California.

Mustelus antarcticus. On the gravid uterus of this species; Parker, Tr. N. Z. Inst. xv. pp. 219–221, pl. xxx.

Pseudotriacis microdon, Capello, from Long Island, redescribed; Bean, P. U. S Nat. Mus. vi. p. 147.

Lamna cuspidata, Ag., figs. 1–3, *elegans*, Ag., figs. 4–6, and *compressa*, Ag., figs. 19–22. Notes and figures; Geinitz, Abh. Ges. Isis, 1883, p. 5, pl. i. (foss.).

Lamna (*Odontaspis*) *verticalis*, Ag. (foss.), described and figured; Dames, SB. Ak Berl. 1883, p. 145, pl. iii. figs. 8–10, from the Tertiary of the Island of Birket-el-Qurûn.

Meristodon, g. n. (foss.), near *Oxyrrhina*, for *M. jurensis*, sp. n., from teeth from the 'Bajocien' of Montmorot, Jura, Sauvage, Bull. Soc. Géol. (3) xi. p. 480, pl. xii. figs. 3 & 4.

Otodus obliquus, Ag. (foss.). Note and figure; Geinitz, Abh. Ges. Isis, 1883, p. 6, pl. i. figs. 12–18, and Dames, SB. Ak. Berl. 1883, p. 145, pl. iii. fig. 6.

Carcharodon angustidens, Ag. (foss.). Note and figure; Geinitz, *l. c.* p. 6, pl. i. fig. 11.

Ancistrodon armatus, Gerv., redescribed; Dames, Z. geol. Ges. xxxv. p. 664, pl. xix. fig. 9, from the Eocene of Western Europe and Cairo.

Ancistrodon mosensis, p. 662, figs. 4 & 5, Breccia of Lousberg, Aix-la-Chapelle, *libycus*, p. 663, figs. 6–8, Chalk of Libyan Desert, *texanus*, p. 664, Chalk of Texas, and *vicentenus*, p. 667, fig. 10, Oligocene of Upper Italy, spp. nn. (foss.), Dames, Z. geol. Ges. xxxv. pl. xix.

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Crossorrhinus ornatus, sp. n., De Vis, P. Linn. Soc. N. S. W. viii. p. 289, Moreton Bay.

Scymnus lichia. Notes on the anatomy and embryology of this Shark; Parker, Tr. N. Z. Inst. xv. pp. 222 & 233, pls. xxxi. & xxxii.

Leptodus, g. n. (foss.) (tooth allied to *Pœcilodus*), for *L. richthofeni*, sp. n., Kayser, in Richthofen's Beiträge zur Palæontologie von China (Berlin: 1883), p. 161, pl. xxi. figs. 9–16, Upper Carboniferous of Loping, in China.

Gnathor[*r*]*hiza*, g. n. (foss.), for *G. serrata*, sp. n., Cope, P. Am. Phil. Soc. xx. p. 629, Permian of Texas.

Ctenacanthus limaformis [*limif-*], fig. 5, *salopiensis*, fig. 6, p. 339, *dubius*,

p. 340, fig. 7, pl. xliv., *lævis*, p. 341, fig. 1, *pustulatus*, p. 344, fig. 2, pl. xlv., spp. nn. (foss.), Davis, Carb. Fishes of G. Brit., from the Carboniferous limestone of Great Britain.

Acondylacanthus colii, p. 347, pls. xlv. fig. 7, & xlvi. fig. 1, *tuberculatus*, p. 348, pl. xlvi. fig. 4, *tenuistriatus*, p. 350, pl. xlv. fig. 8, *attenuatus*, p. 352, pl. xlvi. fig. 3, spp. nn. (foss.), *id. l. c.*

Compsacanthus carinatus, sp. n. (foss.), *id. l. c.* p. 354, pl. xlvi. fig. 10.

Cosmacanthus marginalis, p. 355, fig. 3, *carinatus*, p. 356, fig. 4, spp. nn. (foss.), *id. l. c.* pl. xlviii.

Lispacanthus, g. n. (foss.), for *L. gracilis*, fig. 6, and *retrogradus*, fig. 5, spp. nn , *id. l. c.* p. 359, pl. xlviii.

Gnathacanthus, g. n. (foss.), for *G. triangularis*, p. 363, fig. 11, and *striatus*, p. 364, fig. 12, spp. nn., *id. l. c.* pl. xlviii.

Cladacanthus major, sp. n. (foss.), *id. l. c.* p. 366, pl. xlvii. figs. 6 & 7.

Physonemus attenuatus, sp. n. (foss.), *id. l. c.* p. 369, pl. lxvii. fig. 10.

Chalazacanthus, g. n., for *C. verrucosus*, sp. n., *id. l. c.* p. 371, pl. xlviii. fig. 13.

Cladodus elongatus, p. 374, figs. 10 & 11, *curvus*, fig. 14, and *destructor*, fig. 15, p. 376, *curtus*, p. 379, fig. 19, *hornei*, fig. 20, and *mucronatus*, fig. 21, p. 380, spp. nn. (foss.), *id. l. c.* pl. xlix.

Carcharopsis colii, sp. n. (foss.), *id. l. c.* p. 383, pl. xlix. fig. 26.

Pristicladodus concinnus, sp. n. (foss.), *id. l. c.* p. 385, pl. xlix. fig. 23.

Glyphanodus, g. n. (foss.), for *G. tenuis*, sp. n., *id. l. c.* p. 386, pl. xlix. figs. 24 & 25.

Orodus sculptus, p. 396, fig. 8, *ornatus*, p. 397, fig. 9, *moniliformis*, figs. 10–12, and *reedi*, fig. 13, p. 398, and *tenuis*, p. 399, fig. 14, spp. nn. (foss.), *id. l. c.* pl. li.

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Lophodus reticulatus, p. 407, fig. 22, *serratus*, figs. 23 & 24, and *bifurcatus*, fig. 25, p. 408, *levis*, figs. 26 & 27, and *sinuosus*, fig. 28, p. 409, spp. nn. (foss.), *id. l. c.* pl. li.

Diclitodus, g. n. (foss.), for *D. scitulus*, sp. n., *id. l. c.* p. 410, pl. li. fig. 29.

Sandalodus morrisi, sp. n. (foss.), *id. l. c.* p. 437, pl. liv. figs. 1–6.

Pœcilodus corrugatus, p. 444, fig. 25, and *gibbosus*, p. 445, fig. 27, spp. nn. (foss.), *id. l. c.* pl. liii.

Xystrodus egertoni, figs. 22 & 23, and *pulchellus*, fig. 24, spp. nn. (foss.), *id. l. c.* p. 450, pl. lv.

Helodus crassus, p. 453, figs. 1 & 2, *tenuis*, p. 454, figs. 3 & 4, *clavatus*, figs. 5 & 6, and *acutus*, fig. 7, p. 455, *richmondiensis*, fig. 8, and *triangularis*, fig. 9, p. 456, *expansus*, p. 457, fig. 10, spp. nn. (foss.), *id. l. c.* pl. lix.

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Copodus minimus, sp. n. (foss.), *id. l. c.* p. 467, pl. lviii. fig. 8.

Rhymodus oblongus, sp. n. (foss.), *id. l. c.* p. 473, pl. lviii. fig. 18.

Homalodus, g. n. (foss.), for *H. trapeziformis*, fig. 30, and *quadratus*, fig. 31, spp. nn., *id. l. c.* p. 482, pl. lviii.

Petalodus grandis, p. 496, fig. 1, *recurvus*, fig. 2, and *inequilateralis*, figs. 3 & 4, p. 497, spp. nn. (foss.), *id. l. c.* pl. lx.

Petalodopsis, g. n. (foss.), for *P. tripartitis*, sp. n., Davis, *l. c.* p. 499, pl. lx. fig. 6.

Polyrrhizodus colii, p. 502, figs. 9 & 10, *elongatus*, p. 503, fig. 16, *sinuosus*, p. 504, figs. 11–13, *attenuatus*, p. 505, fig. 14, *constrictus*, p. 506, fig. 15, sp. n. (foss.), *id. l. c.* pl. lx.

Stomatodus acutus, sp. n. (foss.), *id. l. c.* p. 509, pl. lxi. fig. 2.

Ctenopetalus crenatus, sp. n. (foss.), *id. l. c.* p. 513, pl. lxi. fig. 9.

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Pristis bassanii, sp. n. (foss.), Zigno, Mem. Ist. Venet. xxi. pt. 3, p. 783, pl. xv. figs. 13–15, Eocene of Venetia.

Hemipristis bidens, Quenst. (foss.). Teeth figured; Schlosser, Palæontogr. xxviii. p. 59.

Hemipristis curvatus, sp. n. (foss.), Dames, SB. Ak. Berl. 1883, p. 140, pl. iii. fig. 4, Tertiary of the Island of Birket-el-Qurûn.

Propristis, g. n. (foss.), for *P. schweinfurthi*, sp. n., Dames, *l. c.* p. 136, pl. iii. figs. 1 & 2, Tertiary of the Island of Birket-el-Qurûn.

Rhinobatus columnæ, Bonap. Note by Steindachner, Denk. Ak. Wien, lxv. p. 14.

Rhinobatus glaucostigma, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. vi. p. 210, Mazatlan, Mexico.

Raia. On the presence of a tympanum in this genus; Howes, J. Anat. Phys. xvii. pp. 188–190, pl. viii.

Raia inermis, var. n. of *R. binoculata*, Girard, Jordan & Gilbert, Syn. Fish. N. Am. p. 44, Santa Barbara, Cal.

Toniura atra, vii. p. 598, New Guinea, and *mortoni*, viii. p. 212, [illegible] dekin River, Queensland, spp. nn., Macleay, P. Linn. Soc. N. S. W. [illegible].

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Myliobates oweni, Ag. (foss.). Notes by Dames, *l. c.* p. 136.

Myliobates dixoni, Ag., p. 6, pl. i. fig. 7, and *toliapicus*, Ag., p. 7, pl. i. figs. 8–10, & p. 38, pl. ii. fig. 2 (foss.). Notes and figures; Geinitz, Abh. Ges. Isis, 1883.

HOLOCEPHALA.

Chimæra abbreviata, sp. n., Gill, P. U. S. Nat. Mus. vi. p. 255, lat. 40° 16', long. 66° 58', 1290 fath.

GANOIDEI.

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On *Ceratodus*.

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SAGEMEHL, M. Beiträge zur vergleichenden Anatomie der Fische. Morph. JB. ix. pp. 177–227, pl. x.

On the cranium of *Amia calva*, L.

Coccosteus bickensis, Koenen, p. 17, pls. i. fig. 3, ii. fig. 2, & iii. figs 5–7, *C.* (*Brachydirus*) *inflatus*, Koenen, p. 26, pls. i. fig. 1, & iv. figs. 1–3 & 6, *C.* (*B.*) *bidorsatus*, Koenen, p. 28, pl. i. figs. 2 & 4, and *C.* (*B.*) *carinatus*, Koenen, p. 31, pl. ii. fig. 1, described and figured; Koenen, *l. c.* (foss.).

Aspidichthys? ingens, sp. n. (foss.), Koenen, *l. c.* p. 34, pls. iii. fig. 1, & iv. fig. 4, Upper Devonian of N. Germany.

Anomalichthys scaber, sp. n. (foss.), Koenen, *l. c.* p. 38, pl. iii. fig. 2. Upper Devonian of N. Germany.

Pterichthys? rugosus, sp. n. (foss.), E. W. Claypole, P. Am. Phil. Soc. xx. p. 664, pl., Upper Chemung (?) beds, Northern Pennsylvania.

Acanthodes rouvillii, sp. n. (foss.), Sauvage, Bull. Soc. Géol. (3) xi. p. 475, pl. x. fig. 1, Permian of Lodève, France.

Stichacanthus tortworthensis, sp. n. (foss.), Davis, Carb. Fish. of G. Brit. p. 532, pl. lxv. fig. 2.

Peracanthus, g. n. (foss.), for *P. grandis*, sp. n., *id. l. c.* p. 534, pl. lxv. f. 1.

Ceratodus fosteri, Krefft. Note on its habits; Macleay, P. Linn. Soc. N. S. W. viii. p. 211.

Ctenodus obliquus, Hancock & Atthey, var. n. *quinque-costatus* (foss.), Traquair, Geol. Mag. (2) x. p. 543, Black Band Ironstone of Borough Lee, near Edinburgh.

Ctenodus heterolophus and *C. vabasensis*, spp. nn. (foss.), Cope, P. Ac. Philad. 1883, pp. 109 & 110, Permian of Illinois.

Mesodon gigas, Roem. (foss.). Note and figure of remains; Schlosser, Palæontogr. xxviii. p. 58, pl. viii. figs. 4 & 5.

Cornuel, J. Nouvelle note sur les *Pycnodontes portlandicus* et *neocomicus* de l'est du bassin de Paris, et sur des dents binaires de plusieurs d'entre eux. Bull. Soc. Géol. (3) xi. pp. 18–27, pls. i. & ii.

The following species are described:—*Pycnodus sauvagii*, Pict., p. 18, pl. i. figs. 1–3, *vicinus*, sp. n., p. 20, pl. i. figs. 8 & 9, *anceps*, sp. n., p. 21, pl. ii. figs. 1–3, Portlandian, *contiguidens*, p. 23, pl. i. figs. 4 & 5, *asperulus*, sp. n., p. 24, pl. i. figs. 6 & 7, and *couloni*, Ag., p. 24, pl. i. fig. 10, Neocomian.

Pycnodus funkianus, sp. n. (foss.), Geinitz, Abh. Ges. Isis, 1883, p. 39, pl. ii. fig. 4, Coprolithe beds near Harzburg.

Lepidosteus spatula, Lacép. Notes on the possible identity of this fish with *L. tristachus*, Bloch; Jordan & Gilbert, P. U. S. Nat. Mus. vi. p. 110.

Aphanepygus elegans, Bass. (foss.), redescribed and figured from the Cretaceous of the Island of Lesina; Bassani, Denk. Ak. Wien, lxv. Ab. 2, p. 197, pl. i. figs. 1–9.

Thrissops microdon, Heck., p. 208, pl. iii, and *exiguus*, Bass., p. 210, pl. vi. figs. 1 & 2 (foss.), redescribed and figured from the Cretaceous of the Island of Lesina; *id. l. c.*

Leptolepis neocomiensis, Bass., p. 204, pl. ii. figs. 1–5, and *neumayri*, Bass., p. 206, pl. ii. figs. 6–10, redescribed and figured from the Cretaceous of the Island of Lesina; *id. l. c.* (foss.).

Elopopsis haueri, Bass. (foss.), redescribed and figured from the Cretaceous of the Island of Lesina; *id. l. c.* p. 214, pl. iv.

Hemielopopsis suessi, Bass., p. 215, pl. v, and *gracilis*, Bass., p. 216, pl. vi. fig. 3, redescribed and figured from the Cretaceous of the Island of Lesina; *id. l. c.* (foss.).

Prochanus rectifrons, Bass. (foss.), redescribed and figured from the Cretaceous of the Island of Lesina; *id. l. c.* p. 218, pls. xiii., xiv. fig. 1, & xv.

Pachycormus, Ag. (foss.). H. E. Sauvage diagnoses this genus, and describes and figures the head of *P. macropterus*, Ag.; Bull. Soc. Linn. Norm. (3) vii. p. 144, pl. iv.

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Disticholepis dumortieri, Thioll. (foss.). Note ; *id. l. c.* p. 479.

Belonostomus lesinensis, Bass. (foss.), redescribed and figured from the Cretaceous of the Island of Lesina ; Bassani, *l. c.* p. 198, pl. i. fig. 5-*tus*.

Caturus stenospondylus, Sauv., p. 41, *cotteaui*, Sauv., p. 45, and *stenou*. Sauv., p. 46, pl. ii. fig. 2, *velifer*, Thioll., pl. i. fig. 1, and *furcatus*, Ag., pl. i. fig. 2 (foss.), described ; Sauvage, Bull. Soc. Sci. Yonne, (3) vii.

Caturus chaperi, sp. n. (foss.), *id. l. c.* p. 43, pl. ii. fig. 1, Upper Lias of Yonne.

Ectosteorrhachis ciceronius, sp. n. (foss.), Cope, P. Ac. Philad. 1883, p. 69, Permian of Texas.

Didymodus is substituted for *Diplodus*, Agas., preoccupied ; *id. l. c.* p. 108 (foss.).

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Percidæ.

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Lates heberti, Gerv. (foss.). Note by Sauvage, Bull. Soc. Géol. (3) xi. p. 481, pl. xiii. fig. 2.

Paralates, g. n. (foss.), near *Lates*, for *P. bleicheri*, sp. n., Sauvage, *l. c.* p. 485, 'Tongrien' of Roupach, Alsatia.

Percalabrax japonicus, C. & V., described and figured; Steindachner & Döderlein, *l. c.* p. 20, pl. iv. fig. 3 (juv.).

Etheostoma cumberlandicum, sp. n., Jordan & Swain, P. U. S. Nat. Mus. vi. p. 250, Clear Fork of the Cumberland, Kentucky.

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Hadropterus scierus, sp. n., Swain, P. U. S. Nat. Mus. vi. p. 252, South Indiana.

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Anthias margaritaceus, Hilgend., described and figured; Steindachner & Döderlein, *l. c.* p. 17, pl. iii. fig. 1.

Anthias japonicus, sp. n., *iid. l. c.* p. 19, pl. iii. fig. 2, Japan.

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Cerna acutirostris var. n. *lata*, Döderlein, *l. c.* p. 243, pl. iii. fig. 2, Sicily.

Cerna chrysotænia, sp. n., *id. l. c.* p. 268, pl. ii. fig. 4, Sicily.

Serranus ongus, Bl., *mentzeli*, C. & V., and *ouatalibi*, C. & V. Notes on the life-colours of these species; Sauvage, Le Nat. 1883, p. 292.

Serranus brunneus, Bl., described and figured; Steindachner & Döderlein, *l. c.* p. 22, pl. v. fig. 1. Var. *pœcilonotus*, Temm. & Schleg.; *iid. l. c.* fig. 2.

Serranus fuscus, Lowe (= *S. emarginatus*, Val.). Notes by Steindachner, Denk. Ak. Wien, lxv. p. 3.

Serranus estuarius, sp. n., Macleay, *l. c.* p. 200, Mary River.

Serranus goldiei, p. 226, and *magnificus*, p. 229, spp. nn., Macleay, P. Linn. Soc. N. S. W. vii., New Guinea.

Epinephelus galeus (M. & T.), Jordan, apparently = *Serranus itaiara*, C. & V. (*nec* Lichtenst.), and *S. quinque-fasciatus*, Boc.; Jordan, P. Ac. Philad. 1883, p. 285.

Labracopsis japonicus, sp. n., Steindachner & Döderlein, Denk. Ak. Wien. xlvii. p. 27, pl. vi. fig. 3, Japan.

Lutjanus argentivittatus, J. & G., = *L. argentiventris*, Peters, p. 285; *L. inermis*, Peters, p. 285, and *L. vivanus*, C. & V., p. 286, redescribed: Jordan, P. Ac. Philad. 1883.

Lutjanus chrysurus, Bl., *jocu*, C. & V., *auro-rubens*, C. & V., and *uninotatus*, C. & V. Notes on the life-colours of these species; Sauvage, Le Nat. 1883, p. 292.

Genyoroge bidens, sp. n., Macleay, P. Linn. Soc. N. S. W. vii. p. 230, New Guinea.

Genyoroge macleayana, sp. n., Ramsay, P. Linn. Soc. N. S. W. viii. p. 178, Port Jackson.

Dipterodon, Lacép., = *Lutjanus*, Bl.; *Coracinus*, Gronow, should be substituted for *Dipterodon*, C. & V. (*nec* Lacép.): Jordan & Gilbert, P. U. S. Nat. Mus. v. p. 573.

Mesoprion rubens, p. 232, *goldiei*, p. 233, and *parvidens*, p. 234, spp. nn., Macleay, *l. c.*, New Guinea.

Mesoprion marginipinnis, p. 254, and *sexfasciatus*, p. 255, spp. nn., Macleay, *l. c.*, S.E. New Guinea.

Doederleinia, g. n., for *D.* (*Acanthocephalus*) *orientalis*, sp. n., Steindachner & Döderlein, *l. c.* p. 29, Japan.

Pikea maculata, sp. n., *iid. l. c.* p. 26, pl. vi. fig. 1, Japan. *P. lunulata*, Steind.; *iid. l. c.* pl. vi. fig. 2.

Dules papuensis, sp. n., Macleay, *l. c.* p. 257, S.E. New Guinea.

Therapon fuliginosus and *parviceps*, p. 201, Queensland, *nasutus* and *interruptus*, p. 258, *chalybeus* and *trimaculatus*, p. 259, S.E. New Guinea, spp. nn., Macleay, *l. c.*

Pseudohelotes, g. n., near *Helotes*, for *P. guentheri*, Capello (MS.), P. Guimarães, J. Sci. Lisb. viii. [1882] p. 222, Setubal.

Pomadasys, Lacép., must be substituted for *Pristopoma*, Cuv.; Jordan & Gilbert, P. U. S. Nat. Mus. v. p. 574.

Pomadasys modestus (Tschudi), Jordan, = *Pristopoma notatum*, Peters, which is redescribed; Jordan, P. Ac. Philad. 1883, p. 286.

Diabasis sexfasciatus (Gill), J. & G., = *Hæmulon maculosum*, Peters; *id. l. c.* p. 287.

Hæmulon auro-lineatum, C. & V., *elegans*, C. & V., *formosum*, C. & V. Notes on the life-colours of these species; Sauvage, Le Nat. 1883, p. 299.

Diagramma labiosum, sp. n., Macleay, *l. c.* p. 202, Wide Bay, Queensland.

Diagramma unicolor, sp. n., Macleay, *l. c.* p. 261, S.E. New Guinea.

Diagramma papuense, sp. n., Macleay, *op. cit.* vii. p. 237, New Guinea.

T. Gill has a paper on the relations of the family *Lobotidæ*, giving a diagnosis and the synonymy; P. U. S. Nat. Mus. v. pp. 560 & 561.

Histiopterus typus, Schleg., p. 11, pl. ii. fig. 2, and *H. acutirostris*, Schleg., p. 12, pl. iii., described and figured; Steindachner & Döderlein, *l. c.*

Gerres. A review of the American species of this genus by B. W Evermann & S. E. Meek, P. Ac. Philad. 1883, pp. 116–124. 16 species are recorded, and a synopsis and synonymy given.

Gerres gula, C. & V., = ? *Diapterus homonymus*, Goode & Bean; *Diapterus gracilis*, Gill, = ? *Eucinostomus pseudogula*, Pooy, = ? *Gerres harengulus*, Goode & Bean: Evermann & Meek, *l. c.* p. 116.

Gerres gracilis, Gill, p. 118, and *G. gula*, C. & V., p. 121, redescribed; *iid. l. c.*

Gerres peruvianus, C. & V., p. 289, *brasilianus*, C. & V., p. 289, and *brevimanus*, Gthr., p. 290. Notes by Jordan, P. Ac. Philad. 1883.

Scolopsis specularis, sp. n., De Vis, P. Linn. Soc. N. S. W. vii. p. 369, Queensland.

Dentex filosus, Val. Note by Vinciguerra, Ann. Mus. Genov. xviii. p. 500.

Oligorus goliath, sp. n., De Vis, *l. c.* p. 318, Queensland.

Homalogrystes luctuosus, sp. n., *id. l. c.* p. 369, Queensland.

Apogon suezi [!], sp. n., Sauvage, Bull. Soc. Philom. (7) vii. p. 156, Suez.

Apogon (*Apogonichthys*) *guentheri*, Casteln. Notes on this species; Ramsay, P. Linn. Soc. N. S. W. vii. p. 110.

Tetracentrum, g. n. (*Apogonina*), for *T. apogonoides*, sp. n., Macleay, P. Linn. Soc. N. S. W. viii. p. 256, S.E. New Guinea.

Cypselichthys, g. n. (Phalanx *Manini*), for *C. japonicus*, sp. n., Steindachner & Döderlein, *l. c.* p. 15, pl. vii. fig. 1, Japan.

Priacanthus arenatus, C. & V. Note on the life-colours; Sauvage, Le Nat. 1883, p. 293.

Priacanthus japonicus, C. & V., described, xlvii. p. 31, and figured, xlviii. pl. i. fig. 1, Steindachner & Döderlein, *l. c.*

Malakichthys [*Malac-*], g. n., for *M. griseus*, sp. n., *iid. l. c.* xlvii. p. 32, xlviii. pl. ii. fig. 1, Japan.

Enneacanthus simulans, Cope. Note on its habits; Abbott, Am. Nat. xvii. p. 1254.

Mesogonistius chætodon, Baird. Note on its habits; *id. l. c.* p. 1254, woodcut.

Lepomis symmetricus, sp. n., Forbes, in Jordan & Gilbert's Syn. Fish. N. Am. p. 473, Illinois River.

Anoplus banjos, Richards. (= *A. maculatus*, Döderl.), described and figured; Steindachner & Döderlein, *l. c.* p. 7, pl. iv. fig. 1 (juv.).

Melanostoma, g. n., for *M. japonicum*, sp. n., *iid. op. cit.* xlviii. p. 4, pl. i. fig. 2, Japan.

Etelis berycoides, Hilgend., described and figured; Steindachner & Döderlein, Denk. Ak. Wien, xlvii. p. 15, pl. iv. fig. 1.

Pentacerus japonicus, sp. n., *iid. l. c.* p. 8, pl. v. figs. 1 & 2, Japan.

Plioplarchus, g. n. (foss.). Allied to *Mioplosus*, Cope, for *P. whitii*, p. 414, and *P. sexspinosus*, p. 16, spp. nn.; Cope, Am. J. Sci. (3) xxv., Tertiary or Upper Cretaceous of Dakota Territory.

Squamipinnes.

Chætodon gracilis, Gthr. Note on the life-colours; Sauvage, Le Nat. 1883, p. 299.

Chætodon nippon [ensis], sp. n., Steindachner & Döderlein, Denk. Ak. Wien, xlviii. p. 23, pl. iv. fig. 2, Japan.

Ephippus. T. Gill has a note on the Ephippiids, remarking on the external and skeletal characters of this genus, and pointing out its affinity with the Chætodonts; P. U. S. Nat. Mus. v. pp. 557–560.

Ephippus goreensis, C. & V., redescribed; Steindachner, Denk. Ak. Wien, lxv. p. 10.

Chætodipterus, Lacép., must supersede *Parephippus*, Gill; Jordan & Gilbert, P. U. S. Nat. Mus. v. p. 574.

Mullidæ.

Hypeneus semifasciatus, p. 263, and *filamentosus*, p. 264, spp. nn., Macleay, P. Linn. Soc. N. S. W. viii., S.E. New Guinea.

Mulloides flavo-lineatus, Poey. Note on its life-colours; Sauvage, Le Nat. 1883, p. 293.

Sparidæ.

Girella carbonaria, p. 283, and *mentalis*, p. 284, spp. nn., De Vis, P. Linn. Soc. N. S. W. viii., Moreton Bay.

Haplodon castelnaui, sp. n., Thominot, Bull. Soc. Philom. (7) vii. p. 142, Australia. *H. margaritifer*, Dum., p. 142, and *H. sulcatus*, Guich., p. 143, are also redescribed.

Sargus bellotti, Steind., described and figured; Steindachner, Denk. Ak. Wien, lxv. p. 6, pl. ii. fig. 2.

Lethrinus auro-lineatus, sp. n., Macleay, P. Linn. Soc. N. S. W. vii. p. 247, New Guinea.

Pagrus auriga, Val., p. 3, pl. iv. fig. 2, and *P. ehrenbergi*, C. & V., p. 4, pl. v. fig. 1, redescribed and figured; Steindachner, *l. c.*

Pagrus ruber, sp. n. ?, Steindachner & Döderlein, Denk. Ak. Wien, xlviii. p. 20, Japan.

Pagellus bellotti, Steind., described and figured; Steindachner, *l. c.* p. 5, pl. iii. fig. 1.

Sparus. Note on this genus; Gill, P. U. S. Nat. Mus. v. pp. 566 & 567.

Kyphosus [Cy-], Lacép., should be substituted for *Pimelopterus*, Lacép.; Jordan & Gilbert, P. U. S. Nat. Mus. v. p. 572.

Pimelopterus bosci, Lac., var. n. *sicula*, Döderlein, Nat. Sicil. iii. p. 83, Gulf of Palermo.

Parhaplodactylus, g. n., for *Haplodactylus loplodon*, Gthr., *H. arctidens*, Richards., and *P. marmoratus*, sp. n.; Thominot, Bull. Soc. Philom. (7) vii. p. 140, Australia.

Xenisteus, g. n., for *Xenichthys californiensis*, Steind.; Jordan & Gilbert, Syn. Fish. N. Am. p. 920.

Sparosoma, g. n. (foss.), for *S. ovalis*[*-le*], sp. n., Sauvage, Bull. Soc. Géol. (3) xi. p. 487, in the Marls of Aix, Provence.

Cirrhitidæ.

Chilodactylus gibbosus, Richards., described and figured; Steindachner & Döderlein, Denk. Ak. Wien, xlviii. p. 27, pl. vii. fig. 2.

Chilodactylus mullhalli, sp. n., Macleay, P. Linn. Soc. N. S. W. vii. p. 366, Port Jackson.

Paracirrhites, g. n., for *P. japonicus*, sp. n., Steindachner & Döderlein, *l. c.* p. 25, Japan.

Dactylophora, g. n., for *D. semimaculata*, sp. n., De Vis, P. Linn. Soc. N. S. W. viii. p. 284, S. Australia.

Scorpænidæ.

Sebastodes matzubaræ, Hilgendorf (= *Perca variabilis*, pt., Pallas), redescribed; Jordan, P. Ac. Philad. 1883, p. 291.

Scorpæna histrio, Jen., described; *id. l. c.* p. 292.

Peloria rueppelli, Cocco, described and figured; Emery, MT. z. Stat. Neap. iv. p. 403, pl. xxviii. figs. 1–3.

Nandidæ.

Plesiops gigas, sp. n., Steindachner, Anz. Ak. Wien, 1883, p. 196, no loc.

Berycidæ.

Monocentris japonicus. On the mode in which the ventral spine is attached; Riehm, Z. Naturw. (4) ii. p. 107 (with 5 woodcuts).

Hoplostethus mediterraneus, C. & V., var. *japonica*, Hilgend., described and figured; Steindachner & Döderlein, Denk. Ak. Wien, xlvii. p. 10, pl. i.

Trachichthys japonicus, sp. n., *iid. ibid.* pl. ii., Japan.

Caulolepis, g. n. (closely related to *Anoplogaster*), for *C. longidens*, sp. n., Gill, P. U. S. Nat. Mus. vi. p. 258, lat. 39° 27′, long. 69° 56′, 1346 fath.

Beryx subovatus, Bass. (foss.), redescribed and figured from the Cretaceous of the Island of Lesina; Bassani, Denk. Ak. Wien, lxv. p. 226, pl. viii. fig. 4.

Stephanoberyx, g. n. (closely allied to *Melamphaes*), for *S. monæ*, sp. n., Gill, *l. c.* p. 258, lat. 41°, long. 65° 55′, 1253 fath.

Polymixia japonica, Gthr., described and figured; Steindachner & Döderlein, *l. c.* p. 13, pl. iv. fig. 2.

Myripristis jacobus, C. & V. Note on the life-colours; Sauvage, Le Nat. 1883, p. 292.

Holocentrum hastatum, C. & V., redescribed and figured ; Steindachner, Denk. Ak. Wien, lxv. p. 1, pl. i. fig. 1.

Holocentrum longipinne, C. & V. Notes on the life colours; Sauvage, *l. c.*

Holocentrum goldiei, sp. n., Macleay, P. Linn. Soc. N. S. W. vii. p. 352, New Guinea.

Cleidopus [*Cli-*], g. n., for *C. gloria-maris*, sp. n., De Vis, P. Linn. Soc. N. S. W. vii. p. 367, Queensland.

Plectromus, g. n., for *P. suborbitalis*, sp. n., Gill, P. U. S. Nat. Mus. vi. pp. 257 & 258, lat. 38° 52′, long. 69° 24′, 1735 fath.

Cyrtidæ.

Pempheris japonicus, sp. n. (= *P. molucca*, Schleg., *nec* C. & V.), Steindachner & Döderlein, Denk. Ak. Wien, xlviii. p. 29, Japan

Polynemidæ.

Polynemus specularis, sp. n., De Vis, P. Linn. Soc. N. S. W. viii. p. 285, Brisbane River.

Sciænidæ.

Polycirrhus dumerili, Bocourt, = *Genyanemus fasciatus*, Steind. ; Jordan, P. Ac. Philad. 1883, p. 288.

Umbrina ronchus, Val. Notes by Vinciguerra, Ann. Mus. Genov. xviii. p. 612.

Menticirrus saxatilis (Bloch & Schn.), Jordan, = *Sciæna nebulosa*, Mitch. ; Jordan, *l. c.* p. 288.

Umbrina cirrhosa, L., var. *canariensis*, Val., redescribed and figured ; Steindachner, Denk. Ak. Wien, lxv. p. 7, pl. ii. fig. 1.

Menticirrus nasus, Gthr. Notes by Jordan, *l. c.* p. 289.

Sciæna squamosissima, Heck.; Steindachner, Denk. Ak. Wien, xlvi. p. 1.

Sciæna wieneri, sp. n., Sauvage, Bull. Soc. Philom. (7) vii. p. 136, Peru.

Corvina nigra, Bloch. Note and figure by Vinciguerra, Ann. Mus. Genov. xviii. p. 514, pl. i. fig. 1.

Corvina argentea, sp. n., Macleay, P. Linn. Soc. N. S. W. viii. p. 204, Burdekin River, Queensland.

Otolithus macrognathus, Bleeker, redescribed ; Steindachner, Denk. Ak. Wien, lxv. p. 7.

Paralonchurus petersi, Bocourt, redescribed ; Jordan, *l. c.* p. 287.

Isopisthus brevipinnis (C. & V.), Gill, = ? *I. affinis*, Steindachner ; Jordan, *l. c.* p. 289.

Xiphiidæ.

Goode, G. B. Materials for a History of the Sword-fish. U. S. Fish Comm., Rep. of Comm. for 1880. (Washington : 1883.) App. E., pp. 289–386, pls. i.–xxiv.

A complete monograph of the *Xiphiidæ*, with a history of the nomenclature, geographical distribution, size, rate of growth, &c., and descriptive and anatomical notes on the American species.

GILL, T. Nomenclature of the Xiphiids. P. U. S. Nat. Mus. v. pp. 485 & 486.

Xiphias gladius. On a remarkable anatomical peculiarity in the eye of this species; Ciaccio, J. Microgr. vii. p. 323.

Celorrhynchus rectus, Agass. (foss.). Remains described and figured from the Eocene of Venetia; Zigno, Mem. Ist. Venet. xxi. pt. 3, p. 784, pl. xv. figs. 16–18.

TRICHIURIDÆ.

Lepidopus caudatus, Gthr. Notes by Lendenfeld, Zool. Anz. vi. p. 559.

Euchodus lewesiensis, Mantell. (foss.). Note on the pre-maxillary; Sauvage, Bull. Soc. Géol. (3) xi. p. 480, pl. xii. fig. 16.

Euchodus ? sp. (foss.) described and figured; Dames, SB. Ak. Berl. 1883, p. 147, pl. iii. fig. 11, Tertiary of the Island of Birket-el-Qurûn.

CARANGIDÆ.

JORDAN & GILBERT give a review of the American genera and species of this family; P. U. S. Nat. Mus. vi. pp. 188–207. 5 genera and 30 species are distinguished, and a synopsis and synonymy given. 1 species is described as new.

GILL, T. On the family and sub-families of *Carangidæ*. P. U. S. Nat. Mus. v. pp. 487–493.

LUNEL, G. Sur un cas de commensalisme d'un *Caranx* et d'une *Crambessa*. Bibliothèque Universelle (3) x. sc. p. 271, and Rec. Zool. Suisse, i. 1883, pp. 65–74, pl. vi.; translation in Ann. N. H. (5) xii. pp. 264–270.

Caranx leucurus, Gthr. Notes by Jordan, P. Ac. Philad. 1883, p. 284.

Caranx mandibularis, p. 356, *obtusiceps*, p. 357, and *moresbyensis*, p. 358, spp. nn., Macleay, P. Linn. Soc. N. S. W. vii., New Guinea.

Caranx africanus, sp. n., Steindachner, Anz. Ak. Wien, 1883, p. 196, W. Africa.

Caranx compressus, sp. n., Macleay, P. Linn. Soc. N. S. W. viii. p. 204, Burdekin River, Queensland.

Caranx otrynter, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. vi. p. 202, Mazatlan and Panama.

Selene gorcensis, C. & V., pl. vi., and *S.* (?) *setipinnis*, Mitch. (= *Argyriosus setipinnis*, Gthr., = *Vomer browni*, Cuv.). Note by Steindachner, Denk. Ak. Wien, lxv. p. 9.

Chloroscombrus orqueta, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. v. p. 646, Panama.

Naucrates ductor, Osb. Partial synonymy; Gill, *l. c.* p. 490.

Temnodon. T. Gill has a note on the *Pomatomidæ*; l. c. pp. 557 & 567. A brief diagnosis of the characters of this family.

Centropodus and *Acanthopus*, Lacép., = *Monodactylus*, Lacép., and the latter should be substituted for *Psettus*, C. & V.; Jordan & Gilbert, P. U. S. Nat. Mus. v. p. 573.

Argo, g. n., for *A. steindachneri*, sp. n., Steindachner & Döderlein, Denk. Ak. Wien, xlvii. pl. vii., Japan.

Stromateidæ.

Stromateus medius, Peters. Note by Jordan, P. Ac. Philad. 1883, p. 284.

Coryphænidæ.

Coryphæna hippurus, L., redescribed; Steindachner, Denk. Ak. Wien, lxv. p. 8.

Schedophilus medusophagus. Note by T. Gill, Science, i. p. 117.

Scombridæ.

Orcynus brachypterus, C. & V. On its occurrence in the Adriatic; Ninni, Atti Soc. Ital. xxv. pp. 261–264.

Euthynnus, g. n., for *Thynnus pelamys*, L.; Lütken, in Jordan & Gilbert's Syn. Fish. N. Am. p. 429.

Scomberomorus, Lacép., if accepted, must supersede *Cybium*, C. & V.; Jordan & Gilbert, P. U. S. Nat. Mus. v. p. 573.

Cybium maculatum, Mitch. Its natural history, &c.; Earll, U. S. Fish. Comm., Rep. Comm. 1883, pp. 395–424, pls. i.–iii.

Cybium semifasciatum, sp. n., Macleay, P. Linn. Soc. N. S. W. viii. p. 205, Burdekin River, Queensland.

Echeneis. T. Gill writes on the relationships of the Echeneidids; P. U. S. Nat. Mus. v. pp. 561–566, pl. xii.

Echeneis albescens, Temm. & Schl. Notes on this and other species; Vinciguerra, Ann. Mus. Genov. xviii. p. 614.

Trachinidæ.

Percis coxi, sp. n., Ramsay, P. Linn. Soc. N. S. W. viii. p. 179, Port Jackson.

Percis ramsayi, sp. n., Steindachner, Anz. Ak. Wien, 1883, p. 194, Gulf St. Vincent.

Uranoscopus scaber, Lin. Notes on the habits of this fish; Facciolà, Atti Soc. Mod. (3) i. pp. 17–28.

Opisthognathus punctata, Ptrs., redescribed; Jordan, P. Ac. Philad. 1883, p. 290.

Batrachidæ.

Batrachus punctatulus, sp. n., Ramsay, P. Linn. Soc. N. S. W. viii. p. 177, Torres Straits, Queensland.

Porichthys porosissimus, C. & V. (= *P. plectrodon*, J. & G.). Notes by Jordan, P. Ac. Philad. 1883, p. 291.

Porichthys queenslandiæ, sp. n., De Vis, P. Linn. Soc. N. S. W. vii. p. 370, Queensland.

Pediculati.

Gill, T. Supplementary Note on the *Pediculati*. P. U. S. Nat. Mus. v. pp. 551–556.

Lophiomus, g. n., for *Lophius setigerus*, Wahl. Distinguished from *Lophius* by the diminished number of vertebræ (19 instead of 27–31); Gill, *l. c.* p. 552.

Cottidæ.

Cottus divaricatus, p. 162, *pontifex* and *cryptrotremus*, p. 163, and *hypoceras*, p. 164, spp. nn. (foss.), Cope, P. Ac. Philad. 1883, Idaho Pliocene beds.

Cottunculus torvus, sp. n., Goode, in Jordan & Gilbert's Syn. Fish. N. Am. p. 688.

Platycephalus mortoni, sp. n., Macleay, P. Linn. Soc. N. S. W. viii. p. 206, Burdekin River, Queensland.

Platycephalus semermis, sp. n., De Vis, P. Linn. Soc. N. S. W. viii. p. 285, South Australia.

Platycephalus haackii, sp. n., Steindachner, Anz. Ak. Wien, 1883, p. 195, Gulf St. Vincent.

Prionotus horrens, Rich., described; Jordan, P. Ac. Philad. 1883, p. 292.

Prionotus sarritor, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. v. p. 615, South Carolina.

Artedius fenestralis, sp. n., *iid. l. c.* p. 577, Puget Sound.

Cataphracti.

Agonus decagonus, Bloch. Note by Jordan, P. Ac. Philad. 1883, p. 293.

Bothragonus, g. n., Gill, in Jordan & Gilbert's Syn. Fish. N. Am. p. 728, for *B. swani*, Steind.

Cephalacanthus, Lacép., should supersede *Dactylopterus*, Lacép.; Jordan & Gilbert, P. U. S. Nat. Mus. v. p. 573.

Gobiidæ.

Gobiina. List, with notes or short descriptions, of the species (17) found in the Adriatic and the fresh waters of Venice; Ninni, Atti Soc. Mod. (3) i. pp. 221–226.

Gobius quagga, Heck. Notes on this and other species; Vinciguerra, Ann. Mus. Genov. xviii. p. 529.

Gobius canestrinii, sp. n., p. 276, figs. 1–5, and *G. quagga* figured, figs. 6–9; Ninni, Atti Soc. Pad. viii. pl. xv., Italy.

Gobius lichtensteini, sp. n., Steindachner, Anz. Ak. Wien, 1883, p. 214, Adriatic (Island of Solta).

Gobius vittatus, sp. n., Vinciguerra, *l. c.* p. 527, pl. i. fig. 4, Sardinia.

Gobius filamentosus, sp. n., Sauvage, Bull. Soc. Philom. (7) vii. p. 157, New Caledonia.

Gobius haackii, sp. n., Steindachner, Anz. Ak. Wien, 1883, p. 191, South Australia.

Gobius maculipinnis and *circumspectus*, spp. nn., Macleay, P. Linn. Soc. N. S. W. viii. p. 267, S.E. New Guinea.

Gobius eucaomus, p. 611, and *thalassinus*, p. 612, spp. nn., Jordan & Gilbert, P. U. S. Nat. Mus. v., South Carolina.

Apocryptes fasciatus, sp. n., Macleay, *l. c.* p. 268, S.E. New Guinea.

Gobiomoroides, Lacép. Note by Jordan & Gilbert, *l. c.* p. 572. It cannot be used for *Eleotris gyrinus*.

Gobiomorus, Lacép. (type, *G. dormitator*, Lacép.), to be substituted for *Philypnus*, C. & V.; *iid. l. c.* p. 571.

Eleotris planiceps, sp. n., Macleay, P. Linn. Soc. N. S. W. vii. p. 69, Palmer River, N. Queensland, and *immaculatus*, sp. n., *id. op. cit.* viii. p. 263, S.E. New Guinea.

Callionymus achates, sp. n., De Vis, P. Linn. Soc. N. S. W. vii. p. 620, Queensland.

Callionymus partenopæus, sp. n., Giglioli, Zool. Anz. vi. p. 398, Gulf of Naples.

Leme, g. n. (*Amblyopina*), for *L. mordax*, sp. n., De Vis, P. Linn. Soc. N. S. W. viii. p. 286, Murray River, Queensland.

Aristeus cavifrons, sp. n., Macleay, *op. cit.* vii. p. 70, Palmer River, and *goldiei*, sp. n., *id. op. cit.* viii. p. 269, S.E. New Guinea.

Blenniidæ.

Blennius. Notes and figures of larval forms of this genus from Messina; Emery, MT. z. Stat. Neap. iv. pp. 411–417, pl. xxix.

Blennius varus, Risso, p. 129, pl. xviii. fig. 3, *vulgaris*, Pollini, p. 130, pl. xviii. fig. 4, and *lupulus*, Bonap., p. 130, described, and the first two figured; Lortet, Arch. Mus. Lyon, iii., from the Lake of Tiberias.

Blennius rouxi, Cocco, described; Vinciguerra, Ann. Mus. Genov. xviii. p. 534.

Blennius nigriceps, sp. n., Vinciguerra, *l. c.* p. 537, pl. i. fig. 5, Island of Brazza.

Blennius adriaticus and *dalmatinus*, spp. nn., Steindachner, Anz. Ak. Wien, 1883, p. 213, Adriatic.

Blennius periophthalmoides, sp. n., Macleay, P. Linn. Soc. N. S. W. viii. p. 269, S.E. New Guinea.

Isesthes, g. n., for *Blennius gentilis*, Gir.; Jordan & Gilbert, Syn. Fish. N. Am. p. 757.

Salarias atratus, sp. n., Macleay, P. Linn. Soc. N. S. W. vii. p. 361, New Guinea.

Clinus erides, nom. n. for *Myxodes elegans*, Cooper (nec *Clinus elegans*, C. & V.); Jordan & Gilbert, *l. c.* p. 763.

Clinus chilensis, sp. n., Sauvage, Bull. Soc. Philom. (7) vii. p. 157, Chili.

Cremnobates integripinnis. Rosa Smith gives notes on the life-colours of this species; P. U. S. Nat. Mus. vi. p. 216.

Muraenoides maxillaris, sp. n., Bean, in Jordan & Gilbert's Syn. Fish. N. Am. p. 768, St. Paul Island, Alaska.

Dactyloscopus, sp. n. (? = *Dactylagnus mundus*, Gill), Jordan & Gilbert, P. U. S. Nat. Mus. v. p. 628, Panama.

Emblemaria, g. n., for *E. nivipes*, sp. n., *iid. l. c.* p. 627, Panama.

Petroscirtes germaini, sp. n., Sauvage, Bull. Soc. Philom. (7) vii. p. 158, p. w Caledonia.

Sphyrænidæ.

Sphyræna strenua, sp. n., De Vis, P. Linn. Soc. N. S. W. viii. p. 287, Moreton Bay.

Saurocephalus fajumensis, sp. n. (foss.), Dames, SB. Ak. Berl. 1883, p. 147, pl. iii. fig. 12, Tertiary of the Island of Birket-el-Qurûn.

Atherinidæ.

Atherina vardinis, sp. n. (foss.), Sauvage, Bull. Soc. Géol. (3) xi. p. 491, Tertiary of the Gard.

Menidia notata, Mitch. On the thread-bearing ova of this species; Ryder, Bull. U. S. Fish. Comm. iii. pp. 193–196, woodcut.

Menidia audens, sp. n., Hay, in Jordan & Gilbert's Syn. Fish. N. Am. p. 908, Mississippi River.

Menidia laciniata, subsp. n. of *M. vagrans*, G. & B., Swain, *op. cit.* p. 908, Coast of N. California.

Atherinichthys maculatus, sp. n., Macleay, P. Linn. Soc. N. S. W. viii. p. 207, Burdekin River, Queensland.

Atherinichthys eyresi [sic], sp. n., Steindachner, Anz. Ak. Wien, 1883, p. 194, Lake Eyre Expedition.

Mugilidæ.

Mugil capito, C. & V., p. 131, pl. x. fig. 2, *curtus*, Yarrell [!], p. 132, pl. xi. fig. 1, *octo-radiatus*, Gthr., p. 133, pl. xi. fig. 2, and *auratus*, Risso, p. 134, pl. xi. fig. 3; Lortet, Arch. Mus. Lyon, iii., from Lake Tiberias.

Mugil nasutus, sp. n., De Vis, P. Linn. Soc. N. S. W. vii. p. 621, Queensland.

Mugil papillosus, sp. n., Macleay, P. Linn. Soc. N. S. W. viii. p. 276 (woodcut), S.E. New Guinea.

Mugil ramsayi, sp. n., *id. l. c.* p. 208, Burdekin River, Queensland.

Querimana, g. n., for *Myxus harengus*, Gthr.; Jordan & Gilbert, P. U. S. Nat. Mus. v. p. 588, and P. Ac. Philad. 1883, p. 283.

Mugil ciliilabis is a *Querimana*; Jordan, P. Ac. Philad. 1883, p. 283.

Æschrichthys, g. n., for *Æ. goldiei*, sp. n., Macleay, *l. c.* p. 5, New Guinea (with 2 woodcuts).

Gastrosteidæ.

Gastrosteus williamsoni, Grd. Rosa Smith gives notes on this species; P. U. S. Nat. Mus. vi. p. 217.

Centriscidæ.

Centriscus gracilis, Low., and *scolopax*, L., redescribed; Facciolà, Nat. Sicil. ii. p. 253.

Macror[r]hamphosus, Lacép., is to be substituted for *Centriscus*, auctt., and *Centriscus*, L., for *Amphisile*, auctt.; Jordan & Gilbert, P. U. S. Nat. Mus. v. p. 575.

Gobiesocidæ.

Gobiesox cardinalis, sp. n., Ramsay, P. Linn. Soc. N. S. W. vii. p. 148, Coast of Tasmania.

Crepidogaster lineatum [*-ta*], sp. n., Sauvage, Bull. Soc. Philom. (7) vii. p. 158, New Caledonia.

Trachypteridæ.

Lütken, C. Nogle Bemærkninger om Vaagmæren (*Trachypterus arcticus*) og Sildetusten (*Gymnetrus banksi*). Overs. Dan. Selsk. 1882, pp. 206–216. Translated in Ann. N. H. (5) xi. pp. 176–184.

Collett, R. Om dei vort Aarhundrede ved de norske kyster strandede Exemplarer af Slægten *Regalecus*. Forh. Selsk. Chr. 1883, No. 16, 35 pp., 5 pls.

[Recorded from a separate copy.]

Notacanthidæ.

Notacanthus analis, sp. n., Gill, P. U. S. Nat. Mus. vi. p. 255, lat. 40°, long. 68° 50′, 547 fath.

ACANTHOPTERYGII PHARYNGOGNATHI.

Pomacentridæ.

Amphiprion papuensis, sp. n., Macleay, P. Linn. Soc. N. S. W. viii. p. 271, S.E. New Guinea.

Pomacentrus rubicundus. On the life-coloration of the young; Rosa Smith, P. U. S. Nat. Mus. v. pp. 652 & 653.

Pomacentrus analis, sp. n., Macleay, P. Linn. Soc. N. S. W. vii. p. 364, New Guinea.

Glyphidodon saxatilis, L. Note by Steindachner, Denk. Ak. Wien, lxv. p. 11.

Glyphidodon bicolor and *filamentosus*, vii. p. 365, *nigrifrons* and *bimaculatus*, viii. p. 271, spp. nn., Macleay, P. Linn. Soc. N. S. W., New Guinea.

Labridæ.

Hiatula, Lacép., should be substituted for *Tautoga*, Mitch.; Jordan & Gilbert, P. U. S. Nat. Mus. v. p. 571.

Platyglossus guttulatus, vii. p. 587, and *margaritaceus*, viii. p. 274, spp. nn., Macleay, P. Linn. Soc. N. S. W., New Guinea.

Coris cyanea, vii. p. 589, and *papuensis*, viii. p. 275, spp. nn., Macleay, *l. c.*, New Guinea.

Coris semicincta, sp. n., Ramsay, P. Linn. Soc. N. S. W. vii. p. 301, Lord Howe's Island, New South Wales.

Trochocopus sanguinolentus, sp. n., De Vis, P. Linn. Soc. N. S. W. viii. p. 287, Cape Moreton.

Labrichthys elegans, sp. n., Steindachner, Anz. Ak. Wien, 1883, p. 195, Gulf St. Vincent.

Labrichthys dux, sp. n., De Vis, *l. c.* p. 287, Moreton Bay.

Scarus auro-frenatus, C. & V., p. 299, *S. catesbii*, Lac., *Pseudoscarus superbus*, Poey, and *P. quadrispinosus*, C. & V., p. 230. Notes on the life-colours of these species; Sauvage, Le Nat. 1883.

Pseudoscarus goldiei, *frontalis*, and *papuensis*, p. 590, *zonatus*, *labiosus*, and *moresbyensis*, p. 591, spp. nn., Macleay, P. Linn. Soc. N. S. W. vii., New Guinea.

On fossil teeth referable to the *Labridæ*; Sauvage, Bull. Soc. Géol. (3) xi. p. 490, pl. xii. fig. 15.

Embiotocidæ.

Neoditrema, g. n., for *N. ransonneti*, sp. n., Steindachner & Döderlein, Denk. Ak. Wien, xlviii. p. 32, Japan.

Chromides.

Chromis tiberiadis, p. 135, pl. vi., *microstomus*, p. 139, pl. viii. fig. 1, *flavii-josephi*, p. 141, pl. viii. fig. 2, *magdalenæ*, p. 146, spp. nn.; *C. niloticus*, Hasselq., p. 137, pl. vii., *andreæ*, Gthr., p. 142, pl. viii. fig. 3, and *simonis*, Gthr., p. 143, pl. ix. fig. 1: Lortet, Arch. Mus. Lyon, iii., Lake Tiberias.

Hemichromis sacræ, Gthr., redescribed; *id. l. c.* p. 148.

Hemichromis bloyeti, sp. n., Sauvage, Bull. Soc. Philom. (7) vii. p. 159, Kandôa, E. Africa.

Cichla ocellaris, Bl., fig. 2, and *temensis*, Humb., fig. 3, redescribed and figured; Steindachner, Denk. Ak. Wien, xlvi. p. 3, pl. i.

Crenicichla johanni, Heck.; *id. l. c.* p. 3.

Geophagus jurupari, Heck.; *id. l. c.* p. 2.

ANACANTHINI.

Gadidæ.

Gadus poutassou, Risso, redescribed and figured; Vinciguerra, Ann. Mus. Genov. xviii. p. 550, pl. ii. figs. 1 & 2.

Morrhua æglefinoides, Kner. & Steind. (foss.), described from the Post-Tertiary of Croatia; Kramberger-Gorjanovic, Beitr. Pal. Österr.-Ung. iii. p. 65.

Morrhua macropterygia, p. 65, pl. xiii. fig. 6, and *lanceolata*, p. 67, pl. xiii. fig. 5, spp. nn. (foss.), Kramberger-Gorjanovic, *l. c.*, Post-Tertiary of Croatia.

Megalolepis, Kramb. (foss.), = *Merlucius*. The species stand as *M. latus*, Kramb., and *M. elongatus*, Kramb., and are described; *id.* Verh. geol. Reichsanst. 1882, pp. 111–114.

Lotella bacchus. On the connection of the air-bladders and the auditory organ in this fish; Parker, Tr. N. Z. Inst. xv. pp. 234–236, pl. xxxiii.

Phycis blennioides, Bl. On the young stages of this species; Facciolà, Nat. Sicil. ii. [1882] pp. 25–29, woodcut.

Haploporphyrus lepidion, Risso, redescribed and figured; Vinciguerra, Ann. Mus. Genov. xviii. p. 554, pl. iii. Notes on some other species of this genus are also added.

Onos rufus, sp. n., Gill, P. U. S. Nat. Mus. vi. p. 259, lat. 39° 41′, long. 69° 20′, 1106 fath.

Brosmius susedanus, Kner (foss.), described from the Post Tertiary of Croatia; Kramberger-Gorjanovic, Beitr. Pal. Österr.-Ung. iii. p. 68.

Brosmius fuchsianus, p. 68, pl. xiii. fig. 4, *elongatus*, p. 69, pl. xiv. fig. 2, and *strossmayeri*, p. 69, pl. xiv. fig. 1, spp. nn. (foss.), *id. l. c.*, Post-Tertiary of Croatia.

Ophidiidæ.

Bellottia, g. n. (*Brotulina*); distinguished by the absence of ventrals; for *B. apoda*, sp. n., Giglioli, Zool. Anz. vi. p. 399, Gulf of Naples.

Bassozetus, g. n. (*Brotulina*), for *B. normalis*, sp. n., Gill, P. U. S. Nat. Mus. vi. p. 259, lat. 39° 33′, long. 68° 26′, 1555 fath.

Ophidium omostigma, J. & G. Note by Jordan, P. Ac. Philad 1883, p. 293.

Ophidium beani, sp. n., = *O. graellsi*, J. & G., P. U. S. Nat. Mus. v. p. 301 (*nec* Poey); Jordan & Gilbert, P. U. S. Nat. Mus. vi. p. 143.

Scytaliscus to be substituted for *Scytalina*; iid. *l. c.* p. 111.

Macruridæ.

Macrurus bairdi, Goode & Bean, redescribed; Gill, P. U. S. Nat. Mus. vi. p. 259.

Pleuronectidæ.

G. Simmermacher, Einiges über Plattfische und deren Fang in der Kieler Bucht; Zool. Gart. xxiv. pp. 33–37.

Macleay, W. Notes on the *Pleuronectidæ* of Port Jackson, with descriptions of two hitherto unobserved species. P. Linn. Soc. N. S. W. vii. pp. 11–15.

Rhombus maximus. On the contents of the stomach; K. E. H. Krause-Bostock, Arch. Ver. Mecklenb. xxxvi. pp. 134 & 135.

Rhombus bassanianus, p. 71, pl. xiii. figs. 1 & 2, and *parvulus*, p. 72,

pl. xiii. fig. 3, spp. nn. (foss.), Kramberger-Gorjanovic, Beitr. Pal. Österr.-Ung. iii, Post-Tertiary of Croatia.

Pseudorhombus guttulatus, sp. n., Macleay, P. Linn. Soc. N. S. W. viii. p. 276, S.E. New Guinea.

p. 28*Rhomboidichthys podas*, L. (juv. = *Rhombus diaphanus*, Raf., and *Heloria heckeli*, Cocco). On the metamorphosis of this species; Emery, MT. z. Stat. Neap. iv. p. 405, pl. xxviii. figs. 4–6 (and woodcut).

Hemirhombus guineensis, Blkr., redescribed by Steindachner, Denk. Ak. Wien, lxv. p. 13.

Bothus, Raf. On the synonymy of this genus; Jordan & Gilbert, P. U. S. Nat. Mus. v. pp. 576 & 577.

Paralichthys ophryas, sp. n., p. 822, *P. ommatus*, nom. n., p. 824, for *Ancylopsetta quadriocellata*, Gill (nec *Platessa quadriocellata*, Storer); *iid.* Syn. Fish. N. Am.

Lophorhombus, g. n., for *L. cristatus*, sp. n., Macleay, P. Linn. Soc. N. S. W. vii. p. 14, Port Jackson.

Pleuronectes mortoniensis, sp. n., De Vis, P. Linn. Soc. N. S. W. vii. p. 370, Queensland.

Isopsetta, subg. n., for *Lepidopsetta isolepis*, Lock.; Lockington, in Jordan & Gilbert's Syn. Fish. N. Am., p. 832.

Ammotretis zonatus, sp. n., Macleay, P. Linn. Soc. N. S. W. vii. p. 367, Port Jackson.

Solea fluviatilis, p. 111, New South Wales, and *lineata*, p. 406, Port Stephens, spp. nn., Ramsay, P. Linn. Soc. N. S. W. vii.

Solea (*Achirus*) *haackeana*, sp. n., Steindachner, Anz. Ak. Wien, 1883, p. 195, Gulf St. Vincent.

Solea provincialis, sp. n. (foss.), Sauvage, Bull. Soc. Géol. (3) xi. p. 488, in the Marls of Aix, Provence.

Synaptura fasciata, p. 14, Port Jackson, and *S. selheimi*, p. 71, Palmer River, spp. nn., Macleay, P. Linn. Soc. N. S. W. vii.

Synaptura fitzroyensis, vii. p. 319, and *cinerea*, viii. p. 288, spp. nn., De Vis, P. Linn. Soc. N. S. W., Queensland.

Plagusia notata, sp. n., *id. l. c.* viii. p. 288, Moreton Bay.

Cynoglossus goreensis, Steind., p. 12, pl. i. fig. 2, and *canariensis*, Steind., p. 13, pl. ii. fig. 2, redescribed and figured; Steindachner, Denk. Ak. Wien, lxv.

Eurypharyngidæ.

Gill, T., & Ryder, J. A. On the Anatomy and Relations of the *Eurypharyngidæ*. P. U. S. Nat. Mus. vi. pp. 262–273.

[The position of the family, which was established but not named by Vaillant [*cf.* Zool. Rec. xix. *Pisc.* p. 23], is discussed, and a new Order, *Allomeri*, is proposed for its reception. The description of a new genus, *Gastrostomus*, which may prove identical with *Eurypharynx*, is added; type, *G. bairdi*, sp. n., p. 271, lat. 40°, long. 68°, 389–1467 fath.

Eurypharynx pelecanoides, Vaill.; Vaillant, La Nature, 1883, p. 131 (woodcut); Rev. Sci. (3) v. p. 188 (woodcut); Ann. N. H. 5) xi. p. 67.

PHYSOSTOMI.

VAILLANT, L. Remarques sur les Affinités Naturelles des Familles composant le sous-ordre des Poissons Malacoptérygiens Abdomina. Ann. Sci. Nat. xv. Art. 7 (13 pp.).

The author divides the *Physostomi* of Müller into two sub-orders, viz., *Abdominales* and *Apodes*, and remarks on the affinities of the families of the former group, adopting Günther's classification. A schematic table is given, in which the author endeavours to express the points of affinity which the various groups of *Physostomi Abdominales* have with one another and with the *Anacanthini*, *Ganoidei*, and *Dipnoi*.

SILURIDÆ.

Clarias macracanthus, Gthr., redescribed and figured; Lortet, Arch. Mus. Lyon, iii. p. 151, pl. xvii. On its anatomy; Sorensen, Nat. Tids. xiv. pp. 396–407, pl. xvii. figs. 4–9.

Acysis pictus, sp. n., Günther, Ann. N. H. (5) xi. p. 138, Tenasserim.

Olyra elongata, sp. n., *id. l. c.* p. 140, Tenasserim. An amended diagnosis of the genus is given.

Eutropius bocagii, sp. n., Guimarães, J. Sci. Lisb. xxxiv. [1882] p. 85, pl, Angola.

Pseudeutropius siamensis, sp. n., Sauvage, Bull. Soc. Philom. (7) vii. p. 154, Siam.

Hypophthalmus perpoxosus, Cope, redescribed; Steindachner, Denk. Ak. Wien, xlvi. p. 4.

Bagrus buchanani, Val. Remarks on this species; Vaillant, Bull. Soc. Philom. (7) vii. p. 25.

Macrones chinensis, sp. n., Steindachner, Anz. Ak. Wien, 1883, p. 196, China.

Pseudobagrus nudiceps, sp. n., Sauvage, *l. c.* p. 145, Japan. The species is again given as new (p. 155), under the same name and with the identical description, but this time from Siam!

Amiurus albidus, Lesueur. On the development and breeding habits of this species; Ryder, Bull. U. S. Fish. Comm. iii. pp. 225–230.

Amiurus prosthistius, sp. n., Cope, P. Ac. Philad. 1883, p. 133, Batsto River, New Jersey.

Noturus. A review of the genus, with a description of 1 new species; T. Swain & G. B. Kalb, P. U. S. Nat. Mus. v. pp. 638–644.

Noturus classochir, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. v. p. 639.

Pseudopimelodus raninus, C. & V., redescribed; Steindachner, Denk. Ak. Wien, xlvi. p. 4.

Arius assimilis, Gthr., p. 281, and *cærulescens*, Gthr., p. 282. Notes by Jordan, P. Ac. Philad. 1883.

Arius seemani, Gthr., = ? *A. assimilis*, J. & G.; Jordan, *l. c.* p. 282.

Arius latirostris, sp. n., Macleay, P. Linn. Soc. N. S. W. viii. p. 277, woodcut, S.E. New Guinea.

Ariodes æneus, sp. n., Sauvage, Bull. Soc. Philom. (7) vii. p. 160, 'Ile Rafflès.'

Petrocephalus balayi, sp. n., *id. l. c.* p. 159, Congo.

Centromochlus perugiæ, sp. n., Steindachner, Denk. Ak. Wien, xlvi. p. 26, pl. vii. fig. 2, Canelos.

Cetopsis plumbeus, sp. n., *id. l. c.* p. 31, pl. vii. fig. 3, Canelos.

Doras armatulus, C. & V., redescribed; *id. l. c.* p. 5.

Oxydoras stuebeli, sp. n., *id. ibid.* pl. iii. fig. 1, Rio Huallaga.

Arges sabalo, C. & V., p. 17, pl. iv. fig. 2, and *A. prenadilla*, Val., p. 20, pl. v. fig. 5, redescribed; *id. l. c.*

Arges longifilis, sp. n., *id. l. c.* p. 19, pl. v. fig. 3, Rio Huambo.

Epapterus dispilurus, Cope. Note; *id. l. c.* p. 31.

Chætostomus cirrhosus, Val., p. 7, *leucostictus*, Gthr. ?, p. 7, *microps*, Gthr., p. 23, and *branickii*, Steind., p. 23. Notes on these species; *id. l. c.* p. 7.

Chætostomus taczanowskii, sp. n., *id. l. c.* p. 23, pl. v. fig. 2, Rio de Tortara.

Loricaria stuebeli, sp. n., *id. l. c.* p. 6, pl. iii. fig. 26, Rio Huallaga.

Acestra kneri, sp. n., *id. l. c.* p. 26, pl. vii. fig. 1, Canelos.

Erethistes, M. & Tr. (= *Hara*, Blyth). The amended characters are given; Günther, Ann. N. H. (5) xi. p. 139.

Bunocephalus bicolor, p. 8, fig. 1, and *kneri*, p. 9, fig. 2, spp. nn., Steindachner, *l. c.* pl. ii., Rio Huallaga.

Trichomycterus taczanowskii, p. 22, fig. 1, Rio Huambo, and *T. amazonicus*, p. 29, fig. 4, Cudajas, spp. nn., *l. c.* pl. vi.

Stegophilus reinhardti, fig. 1, [illegible]*acrops*, fig. 2, spp. nn., *id. l. c.* p. 18, pl. vi., Lake Manacapuru, above Manaos, Upper Amazon.

Scopelidæ.

Scopelus. Notes on and figures of larval forms referred to this genus from Messina; Emery, MT. z. Stat. Neap. iv. pp. 409–411, figs. 7–14.

Scopelus doderleini, p. 193, pl. x. figs. 1–4, and *acanthurus*, p. 166, spp. nn., Facciolà, Nat. Sicil., Anno 1 [1882], Messina. Both = *S. manderensis*, Lowe; Döderlein, *l. c.* pp. 258–263.

Scopelus acanthurus, i. [1882] p. 166, and *S. uracollampus*, iii. p. 151, spp. nn., Facciolà, *l. c.*, Messina.

Saurida ferox, sp. n., Ramsay, P. Linn. Soc. N. S. W. viii. p. 177, Port Jackson.

Paralepis coregonoides. On its occurrence in Cornwall; Day, Zool. 1883, pp. 381, 382, & 350.

Alepi[di]chthys argyrogaster, sp. n., Facciolà, Nat. Sicil. i. [1882] p. 167, Messina.

Alepidosaurus æsculapius, sp. n., Bean, P. U. S. Nat. Mus. v. p. 661, Alaska.

Pelopsia, g. n. Type of a new family having affinity with the *Sternoptychidæ* and *Scopelidæ*, for *P. candida* and *P. scillæ*, spp. nn.; Facciolà, Nat. Sicil. ii. p. 145, Messina. Is the young of *Chlorophthalmus agassizi*, Bp.; *id. op. cit.* iii. p. 71.

CYPRINIDÆ.

Catostomus shoshonensis, p. 159, and *cristatus*, p. 160, spp. nn. (foss.), Cope, P. Ac. Philad. 1883, 'Lake Idaho,' Pliocene.

Catostomus labiatus, Ayres (foss.), p. 150, and *tahoensis*, Gill & Jordan, p. 152. Notes by Cope, *l. c.* p. 150.

Catostomus batrachops, sp. n. (foss.), *id. l. c.* p. 151, near Silver Lake, Oregon.

Ictiobus = *Bubalichthys* = *Carpiodes*: Jordan & Gilbert, P. U. S. Nat. Mus. vi. p. 110. The following species are recognized as valid:—*Ictiobus cyprinella* (C. & V.), Ag., *I. urus*, Ag., *I. bubalus*, Raf., *I. carpio*, Raf., and *I. cyprinus*, Le S.

Chasmistes cujus ("Couia"), sp. n., Cope, *l. c.* p. 149, Pyramid Lake, Nevada.

Chasmistes brevirostris, Cope, and *luxatus*, Cope. Notes; *id. ibid.*

Cyprinus carpio. Answers to 118 questions relative to German Carp, and woodcut of this variety; Smiley, Bull. U. S. Fish. Comm. iii. pp. 241–248. On the occurrence of fossil remains of this species in North Germany; Nehring, SB. nat. Fr. 1883, p. 68.

Mylocyprinus inflexus, sp. n. (foss.), Cope, *l. c.* p. 154, Idaho Pliocene Lake.

Mylocyprinus robustus, Leidy (foss.). Notes; *id. l. c.* p. 155.

Diastichus, Cope (foss.). Note on this genus; *id. l. c.* p. 158. *D. strangulatus*, sp. n. (foss.), *id. l. c.*, Idaho Pliocene Lake.

Discognathus lamta, Gthr., redescribed and figured; Lortet, Arch. Mus. Lyon, iii. p. 153, pl. xvi. figs. 4 & 5.

Discognathus chiarinii, sp. n., Vinciguerra, Ann. Mus. Genov. xviii. p. 696 (with woodcut), Abyssinia. Note and woodcut also of *D. lamta*, Ham. Buch., p. 695.

Barbus canis, C. & V., p. 161, pl. xii. fig. 1, and *longiceps*, p. 163, pl. xiii. fig. 1, redescribed and figured; Lortet, *l. c.*

Puntius siamensis, sp. n., Sauvage, Bull. Soc. Philom. (7) vii. p. 152, Siam.

Hybognathus flavipinnis, Slando River, Texas, and *nigro-taeniatus*, Medina River, Texas, spp. nn., Cope, in Jordan & Gilbert's Syn. Fish. N. Am. p. 156.

Dillonia dilloni, C. & V., redescribed; Vinciguerra, Ann. Mus. Genov. xviii. p. 699.

Hemitremia vittata, Cope. Notes on this fish; Jordan & Swain, P. U. S. Nat. Mus. vi. p. 249.

Capoeta sauvagii, sp. n., p. 154, pl. xiii. fig. 2, *syriaca*, Gthr., p. 155, pl. xiv., *fratercula*, Gthr., p. 156, pl. xv. fig. 1, *amir*, Gthr., p. 158, pl. xv. fig. 2, *socialis*, Heckel, p. 159, pl. xv. fig. 3, and *damascina*, redescribed and figured; Lortet, Arch. Mus. Lyon, iii., Lake Tiberias.

Cliola angustarca, Cope (foss.). Note by Cope, P. Ac. Philad. 1883, p. 142.

Minnilus scepticus, sp. n., Jordan & Gilbert, Syn. Fish. N. Am. p. 200, Saluda River, South Carolina.

Agosia novem-radiata, sp. n., Cope, *l. c.* p. 141, Weber River, Utah.

Platygobio pallidus, sp. n., Forbes, in Jordan & Gilbert, *l. c.* p. 220, Ohio River.

Leuciscus tricolor, sp. n., p. 166, pl. xii. fig. 2, and *L. lepidus*, Gthr., p. 167, pl. xiii. fig. 3; Lortet, *l. c.*, Lake Tiberias.

Squalius posticus, Cope, and *laminatus*, Cope, p. 157, *bairdi*, Cope, and *arciferus*, Cope, p. 158. Notes on the fossil species; Cope, *l. c.*

Squalius reddingi, sp. n. (foss.), *id. l. c.* p. 157, Idaho Pliocene Lake.

Squalius cæruleus, Girard. Notes; *id. l. c.* p. 147.

Squalius galtiæ, sp. n., *id. l. c.* p. 148, Pyramid Lake, Nevada.

Squalius cærulescens, p. 146, and *japonicus*, p. 147, spp. nn., Sauvage, Bull. Soc. Philom. (7) vii., Japan. *S. hakuensis*, Gthr., is also redescribed.

Myloleucus gibbarcus, Cope, *formosus*, Girard, and *parovanus*, Cope. Notes by Cope, *l. c.* p. 143.

Myloleucus thalassinus, sp. n., *id. l. c.* p. 144, Goose Lake, Oregon.

Leucus olivaceus and *dimidiatus*, spp. nn., *id. l. c.* p. 145, Pyramid Lake, Nevada.

Leucus condonianus, sp. n. (foss.), *id. l. c.* p. 156, Idaho Pliocene Lake.

Siphateles, g. n. (lateral line undeveloped, other characters the same as in *Leucus*), for *S. vittatus*, sp. n., *id. l. c.* p. 146, Pyramid Lake, Nevada.

Phoxinus steindachneri, sp. n., Sauvage, Bull. Soc. Philom. (7) vii. p. 148, Japan.

Phoxinellus libani, sp. n., p. 164, pl. xi. fig. 4, and *zeregi*, Heckel, p. 165, redescribed; Lortet, *l. c.*, Lake Tiberias.

Paraphoxinus ghetaldi, Steind., described and figured; Steindachner, Denk. Ak. Wien, lxv. p. 16, pl. v. fig. 2.

Trycherodon, g. n., for *T. megalops*, sp. n., Forbes, in Jordan & Gilbert's Syn. Fish. N. Am. p. 247, Illinois River.

Achilognathus steenackeri, sp. n., Sauvage, *l. c.* p. 146, Japan.

Rhodeus syriacus, sp. n., Lortet, *l. c.* p. 168, pl. xii. fig. 3, Lake Tiberias.

Alburnus vignoni, sp. n., p. 170, pl. xvi. fig. 3, and *sellal*, Heckel, p. 169, pl. xvi. fig. 2; *id. l. c.*, Lake Tiberias.

Paralaubuca harmandi, sp. n., Sauvage, *l. c.* p. 153, Siam.

Barilius ornatus, sp. n., *id. l. c.* p. 153, Siam.

Opsariichthys steenackeri, sp. n., *id. l. c.* p. 148, Japan.

Tribolodon, g. n. of the group *Danionina*, for *T. punctatum*[*-tus*], sp. n., *id. l. c.* p. 149, Japan.

Cobitidina. Note on fossil remains referred to this family from Idaho Pliocene Lake; Cope, *l. c.* p. 161.

Nemachilus leontinæ, sp. n., p. 171, pl. xviii. fig. 1, and *tigris*, Gthr., p. 172, pl. xviii. fig. 2; Lortet, *l. c.*, Lake Tiberias.

Characinidæ.

Curimatus rutiloides, Kner, redescribed: Steindachner, Denk. Ak. Wien, xlvi. p. 11.

Curimatus meyeri, sp. n., *id. l. c.* p. 11, pl. i. fig. 4, Rio Huallaga.

Prochilodus nigricans, Agass., redescribed; *id. l. c.* p. 12.

Leporinus trifasciatus, Steind., redescribed; Steindachner, *l. c.* p. 13.

Anostomus fasciatus, Spix, and *taeniatus*, Kner. Notes on these species; *id. l. c.* p. 12.

Tetragonopterus lepidurus, Kner, p. 32, and *hauxwellianus*, Cope, p. 34; *id. l. c.* The latter is redescribed.

Tetragonopterus jelskii, Steind. Note; *id. l. c.* p. 25.

Tetragonopterus xinguensis, p. 32, *ocellifer*, p. 32, pl. vii. fig. 5, *colletti*, p. 33, pl. vii. fig. 3, *bellotti*, p. 34, *copii*, p. 35, pl. vi. fig. 6, *bairdi*, p. 35, *elegans*, p. 36, pl. vii. fig. 4, and *schmardæ*, p. 37, pl. vii. fig. 6, spp. nn., *id. l. c.*, Streams of the Amazon.

Tetragonopterus huambonicus, sp. n. ? (? = *T. polyodon*, Gthr.), *id. l. c.* p. 25, pl. v. fig. 1, Rio Huambo.

Chirodon insignis, Steind., and *C.* (*Odontostilbe*) *fugitivus*, Cope. Notes; *id. l. c.* p. 39.

Chirodon eques, p. 37, *agassizi*, p. 38, *pequira*, p. 38, and *pulcher*, p. 39, spp. nn., *id. l. c.*, Streams of the Amazon.

Stethaprion copii, sp. n., and *erythrops*, Cope, redescribed; *id. l. c.* p. 40, Streams of the Amazon.

Piabucina unitæniata, Gthr. Note; *id. l. c.* p. 41.

Brycon stuebeli, sp. n., *id. l. c.* p. 13, pl. i. fig. 1, River Amazon.

Chalcinus angulatus, Spix. Notes on this species; *id. l. c.* p. 14.

Cynodon scomberoides, C. & V., *vulpinus*, Spix, and *gibbus*, Spix. Notes; *id. l. c.* p. 15.

Xiphorhamphus microlepis, Schomb. Notes on this species; *id. l. c.* p. 14.

Serrasalmo humeralis, C. & V., and *elongatus*, Kner. Notes; *id. l. c.* p. 16.

Cyprinodontidæ.

Cyprinodon cypris, Gthr., p. 174, pl. x. fig. 3, *dispar*, Rüpp., p. 175 (with woodcut), and *sophiæ*, Heckel, described; Lortet, Arch. Mus. Lyon, iii.

Haplochilus antinori [*i*], sp. n., Vinciguerra, Ann. Mus. Genov. xviii. p. 693 (with woodcut).

Zygonectes brachypterus, sp. n., Cope, Bull. U. S. Nat. Mus. xvi. p. 341, Rivers of Texas.

Fundulus zebrinus, nom. n. for *F. zebra*, Dekay, preoccupied; Jordan & Gilbert, Syn. Fish. N. Am. p. 891.

Fundulus adinia, sp. n., *iid. l. c.* p. 335, Coasts of Texas.

Cynolebias robustus, sp. n., Günther, Ann. N. H. (5) xi. p. 140, Buenos Aires.

Scombresocidæ.

Tylosurus hians (C. & V.), J. & G., ? = *Belone maculata*, Poey; Jordan, P. Ac. Philad. 1883, p. 283.

Exocœtus rufipinnis, C. &. V. (? = *E. dowi*, Gill). Note; *id. l. c.* p. 283.

Exocœtus maculipinnis, sp. n. ?, Vinciguerra, Ann. Mus. Genov. xviii. p. 577, pl. i. fig. 6, Tunis. Notes on other species are added.

Esocidæ.

Esox salmoneus, J. & G., = *E. umbrosus*, Kirkland, = *E. vermiculatus*, Le Sueur, which latter name must stand ; Jordan & Gilbert, P. U. S. Nat. Mus. vi. p. 110.

Galaxiidæ.

Galaxias findlayi, sp. n., Macleay, P. Linn. Soc. N. S. W. vii. p. 106, Australian Alps.

Mormyridæ.

On the brain of the *Mormyridæ* ; Sanders, Phil. Tr. clxxiii. p. 927.

Sternoptychidæ.

Argyropelecus hemigymnus, Cocco, redescribed; Facciolà, Nat. Sicil. ii. p. 206.

Maurolicus amethystino-punctatus, Cocco, and *poweriæ*, Cocco, p. 207, and *attenuatus*, Cocco, p. 208, redescribed; *id. l. c.*

Chauliodus sloani, Bl., redescribed ; *id. l. c.* p. 188.

Gonostoma denudatum, Raf., redescribed ; *id. l. c.* p. 205, and *op. cit.* iii. p. 24.

Sigmops, g. n. (without scales or pseudobranchiæ, a short dorsal and long anal commencing opposite to each other), for *S. stigmaticus*, sp. n., Gill, P. U. S. Nat. Mus. vi. p. 256, lat. 38° 19′, long. 68° 20′, 2361 fath.

Stomiatidæ.

Hyperchoristus, g. n., for *H. tanneri*, sp. n., Gill, P. U. S. Nat. Mus. vi. p. 256, lat. 40° 26′, long. 66° 58′, 956 fath.

Salmonidæ.

Anderson, J. Notes on the Biology of the Salmon and Grilse. Bull. U. S. Fish. Comm. iii. pp. 429–430.

Arthur, W. Notes on the Salmon Disease in the Tweed and other Rivers, and its Remedy. N. Z. J. Sci. i. 1883, pp. 347–353.

Fryer, C. E. The Salmon Fisheries. London : 8vo, 1883, 77 pp. (Handbook, Internat. Fish. Ex.)

Smitt, F. A. Schematisk framställning af de i Riksmuseum befintliga laxartade fiskarnes slägtskapsförhållanden. Œfv. Ak. Förh. xxxix. 1882, pp. 31–40. Also (translation in English in) Swedish Cat. Int. Fish. Ex. 1883. Stockholm : 8vo, pp. 178–193.

Contains a synopsis of the genera and species of *Salmonidæ* found in Swedish waters.

Salmo fontinalis. On variations in form and hybridism in this species; Day, J. L. S. xvii. pp. 13–19.

Salmo purpuratus, Pall. Notes by Cope, P. Ac. Philad. 1883, p. 141.

Salmo bouvieri, var. n. of *S. purpuratus*, Bendire, in Jordan & Gilbert's Syn. Fish. N. Am. p. 315, Waha Lake, Washington.

GOLL, H. Contribution à l'histoire naturelle des Corégones du lac de Neuchâtel. Arch. Sci. nat. (3) x. pp. 341–343.

Coregonus hoyi, Gill, redescribed; Bean, P. U. S. Nat. Mus. v. p. 658.

Coregonus clupeiformis, Mitch. Its first food is almost wholly very small *Entomostraca*; S. A. Forbes, Bull. Illin. Lab. N. H. vi. pp. 95–109.

Coregonus kennicotti, sp. n., Milner, in Jordan & Gilbert's Syn. Fish. N. Am. p. 298, Alaska.

OSTEOGLOSSIDÆ.

Osteoglossum bicirrhosum, Vand. Note by Steindachner, Denk. Ak. Wien, xlvi. p. 16.

CLUPEIDÆ.

EWART, T. C. The Early History of the Herring. Nature, xxix. pp. 105–107.

W. ARTHUR gives notes on the New Zealand Sprat, pp. 203–208, fig. and on the Picton Herring (*Clupea sagax*, Jenyns), pp. 208–213, fig. 2; Tr. N. Z. Inst. xv. pl. xxxiv.

Clupea finta, C. & V., and *alosa*, L. On some additional characters for distinguishing these species; Hilgendorf, SB. nat. Fr. 1883, p. 90.

Clupea [*Alosa*] *setosa*, Steind. Note by Steindachner, *op. cit.* lxv. p. 14.

Clupea brevissima, Blainv., p. 219, pls. vii. figs. 5 & 6, & viii. figs. 1–3, and *gaudrii*, Pict. & Humb., p. 223, pl. vii. figs. 1–4, redescribed and figured from the Cretaceous of the Island of Lesina; Bassani, Denk. Ak. Wien, lxv. (foss.).

Clupea elongata, Steind., p. 74, *melettiformis*, Steind., p. 74, pl. xiii. fig. 12, *arcuata*, Kner, p. 75, *inflata*, Vukotin, p. 75, pl. xiv. fig. 3, *humilis*, v. Myr., and *lanceolata*, v. Myr., p. 76, *sardinites*, Heckel, p. 76 (foss.), from the Post-Tertiary of Croatia; Kramberger-Gorjanovic, Beitr. Pal. Österr.-Ung. iii.

Clupea doljeana, p. 77, pl. xiv. fig. 4, *vukotinovici*, p. 78, pl. xiv. figs. 7 & 8, *maceki*, p. 79, pl. xiv. figs. 10 & 11, and *heterocerca*, pl. xiii. fig. 9, spp. nn. (foss.), *id. l. c.*, Post-Tertiary of Croatia.

Clupanodon, Lacép., to be substituted for *Clupeonia*, C. &. V.; Jordan & Gilbert, P. U. S. Nat. Mus. v. p. 574.

Engraulis carpentariæ, sp. n., De Vis, P. Linn. Soc. N. S. W. vii. p. 320, Queensland.

Chatoessus elongatus, sp. n., Macleay, P. Linn. Soc. N. S. W. viii. p. 209, Mary River, Queensland.

Spratelloides madagascariensis, sp. n., Sauvage, Bull. Soc. Philom. (7) vii. p. 160, Madagascar.

Spathodactylus, Pictet? (foss.). Notes and figure on a species of this genus (?) from the Cretaceous of the Island of Lesina; Bassani, *l. c.* p. 212, pl. xvi.

Scombroclupea macrophthalma, Heck. (foss.), redescribed and figured from the Cretaceous of the Island of Lesina; Bassani, *l. c.* p. 225, pl. viii. figs. 7–13.

ALEPOCEPHALIDÆ:

Alepocephalus productus, sp. n., Gill, P. U. S. Nat. Mus. vi. p. 256, lat. 39° 26′, long. 70°, 1362 fath.

HALOSAURIDÆ.

Halosaurus goodii, sp. n., Gill, P. U. S. Nat. Mus. vi p. 257, ca. lat. 39°, long. 70°, 1098–1731 fath.

MURÆNIDÆ.

LEPORI, C. Il maschio dell' *Anguilla*. Atti Soc. Ital. xxvi. pp. 327–336.

ROBIN, A. Sur la structure des corps rouges du Congre. J. de l'Anat. Phys. xix. pp. 528–537, pl. xxxvii.

Anguilla vulgaris = *A. rostrata*; Meek, Bull. U. S. Fish. Comm. iii. G430.

Note on the structure and texture of the spleen; Phisalix, C.R. xcvii. pp. 190–192 & 674–677.

Anguilla marginipinnis, sp. n., Macleay, P. Linn. Soc. N. S. W. viii. p. 210, Burdekin River, Queensland.

Myrophis vafer, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. v. p. 645, Panama.

Myrophis punctatus, Lütken, = *M. microstigmius*, Poey; *M. punctatus*, Gthr., = ? *M. vafer*, J. & G.; *M. lumbricus*, J. & G., may prove to be the young of *M. punctatus*: Jordan, P. Ac. Philad. 1883, p. 282.

Ophichthys. On the nomenclature of this genus; Jordan & Gilbert, *l. c.* pp. 648–651.

Sidera chlerastes, sp. n., *iid.* P. U. S. Nat. Mus. vi. p. 208, Galápagos Island. A synopsis of the other known species of this genus from the Pacific Coast of America is added.

Sidera castanea, p. 647, Mazatlan, and *verrilli*, p. 623, Panama, spp. nn., *iid.* op. cit. v.

Gymnothorax wieneri, sp. n., Sauvage, Bull. Soc. Philom. (7) vii. p. 161, Chili or Peru.

Gymnomuræna, Lacép., should stand for *Muræna zebra*, Gthr., and its allies; Jordan & Gilbert, *l. c.* p. 575.

Murænoblenna, Lacép., to be substituted for *Gymnomuræna*, Gthr. (*nec* Lacép.); *iid. l. c.* p. 575.

Serrivomer, g. n., for *S. beani*, sp. n., Gill & Ryder, P. U. S. Nat. Mus. vi. p. 261, lat. 41° 40′, long. 65° 28′, 855 fath.

Spinivomer, g. n., for *S. goodii*, sp. n., *iid. ibid.*, lat. 38° 19′, long. 68° 20′, 2361 fath.

Labichthys, g. n., for *L. carinatus*, p. 261, lat. 41° 13′, long. 65° 33′, 906 fath., and *elongatus*, p. 262, lat. 39° 22′, long. 68° 34′, 1628 fath., spp. nn., *iid. l. c.*

Histiobranchus, g. n., for *H. infernalis*, sp. n., Gill & Ryder, *l. c.*, p. 255, lat. 38° 30′, long. 69°, 1731 fath.

Leptocephali.

Leptocephalus affinis, sp. n., Facciolà, Nat. Sicil. ii. p. 147, Messina.

Leptocephalus stenops, Kaup., p. 147, and *kefersteini*, Kaup., p. 148, described ; *id. l. c.*

Helmichthys coccoi, sp. n., *id. op. cit.* i. [1882], p. 168, Messina.

Helmichthys punctatus, Raf., described ; *id. l. c.*

Oxystomus hyalinus, Raf., described and figured ; *id. l. c.* pp. 167 & 186, pl. vii. fig. 2.

Oxystomus rafinesquii, sp. n., *id. l. c.* fig. 1, Messina.

LOPHOBRANCHII.

Syngnathus peckianus, Storer. On the osteology and development of this species ; McMurrich, Q. J. Micr. Sci. xxiii. pp. 623–650, pls. xlii. & xliii. ; extr. in J. Hopk. Univ. Circul. iii. pp. 4 & 5.

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PLECTOGNATHI.

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BY

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The second volume of TRYON's "Structural and Systematic Conchology" contains a systematic enumeration and brief description of all known genera of the *Cephalopoda*, *Pteropoda*, *Gastropoda*, *Prosobranchiata*, and *Opisthobranchiata*, and figures of most of them, recent and fossil, somewhat in the manner of Woodward's well-known Manual; also with occasionally interesting remarks on the habits, geographical distribution, &c., of some genera, or the use by man; 430 pp. 91 pls.

The same author has continued his special descriptive work, "Manual of Conchology," treating, in vol. iv. pt. 2, of the *Nassidæ*, *Turbinellidæ*, *Volutidæ*, and *Mitridæ*; in vol. v., the *Marginellidæ*, *Olividæ*, and *Columbellidæ*.

Critical remarks concerning this work by W. DALL, Science, 1883, p. 40.

E. v. MARTENS has published a brief popular treatise on the *Mollusca* and their shells (title, *vide suprà*), treating first of the shells and the structure of the animals generally, and then going through the most important families and genera in systematic order, with notices of their occurrence and geographical distribution; injuries to man, and his use of shells and shellfish for food, ornaments, &c., are discussed. Some of the woodcuts are original. See also Nachr. mal. Ges. 1883, pp. 89–92.

A. DE GREGORIO, in a single sheet printed at Palermo, proposes a new or more precise terminology for the sculpture and various dimensions of the shells of Gastropods and Bivalves; for example, he suggests the use

of "costæ," "funiculi," "fila," and "lineæ," only for elevated sculpture; "canaliculi," "sulci," and "striæ," only for deepened sculpture; "vittæ," "versus," and "lineolæ," only for colouration; "umbo-transversal dimension," for the height of Bivalves from the umbones to the ventral margin; "antero-posterior dimension," for their length; and "bisectional diameter," for the transverse dimension from one valve to the other at the most distant parts. Among the Gastropods, no strikingly new terms are to be found.

Anatomy and Physiology.

1. *Muscular System and Connective Tissue.*

F. Plateau has measured the weight necessary to overcome the resistance of the adductor muscles in living Bivalves of various genera, and compares it with the transverse sections of these muscles; he comes to the results that the muscular force of the adductors is, in *Venus verrucosa*, equivalent to 12431 grammes for each square centimeter; in *Pectunculus glycymeris*, 10152; *Mytilus edulis*, 7984; *Ostrea edulis*, 5867; *Pecten maximus*, 3786; *Cardium edule*, 2856; *Tridacna*, 1595; *Mya arenaria*, 1178; *Pecten opercularis*, 530. This force is therefore partly similar to, and partly lower than, that observed in the muscles of the *Vertebrata*. If only the opaque, not transparent, portion of the adductor muscles is taken into consideration for this purpose, according to the observations by A. Coutance [see Zool. Rec. xv. *Moll.* p. 9], the numbers become, of course, higher; for example, 13122 in *Ostrea edulis*, and 14923 in *Pecten maximus*: but even then they do not considerably exceed those observed in the muscles of man and of the frog. The author, however, thinks that this should not be done, as the opaque portion in *Tapes*, *Venus*, *Cardium*, and *Mya*, forms only a small girdle on the external side of the adductor, and in *Pectunculus* one of the adductors is nearly wholly opaque, the other nearly completely transparent. Bull. Ac. Belg. (3) vii. Nos. 9 & 10.

The disposition of the muscles in the foot of *Solen* described by P. S. Abraham, Ann. N. H. (5) xi. p. 214.

J. Brock has examined the interstitial connective tissue in several *Mollusca*, especially *Aplysia*, *Pleurobranchus*, *Pleurobranchæa*, *Helix*, *Limax*, and *Arion*. It exhibits various degrees of development in these genera: in *Aplysia punctata*, it is very minutely fibrillar; in the *Pulmonata*, the plasmatic cells prevail, the structureless sheath is well developed, and the fibrillæ are rather scarce, and often without nuclei. The author thinks that this tissue has its origin in the spindle-shaped or ramified mesodermic cells in the cavity of the body, and asserts its homology with the conjunctive tissue of the *Vertebrata*. Z. wiss. Zool. xxxix. pp. 1–63, pls. i.–iv.

2. *Digestion.*

The buccal cavity of the *Rhipidoglossa*, with special regard to its glands and goblet-shaped cells, is described by B. Haller, Morph. JB. ix.

pp. 1–98, pls., and that of *Chiton siculus* (Gray) incidentally by the same author in Arb. z. Inst. Wien, v. pt. 1.

A. Rücker describes the formation of the radula of *Helix pomatia*. He comes to the conclusion that the radular membrane takes its origin in a cluster of cells whose hinder ends are within the sheath of the radula, but that the teeth themselves are separately formed, each by a chitinous secretion issuing from two contiguous distinct cells. The radular membrane always remains connected with the subradular (the elastic plate of Huxley), and its progressive advancement is caused by the feeble but continual traction of the muscular mass in the furrow of the radula. Ber. oberhess. Ges. xxii. pp. 209–299, pl. iii.; abstract in JB. mal. Ges. x. p. 390.

D. Barfurth has examined the different cells in the liver of the *Mollusca*, and distinguishes ferment-cells, liver-cells, and lime-cells (Kalkzellen); he thinks that the latter contain phosphate of calcium, and represent a store of calcareous, matter to be consumed in the further growth of the shell: Arch. mikr. Anat. xxii. p. 473 *et seq.* J. Frenzel thinks it by no means proved that the so-called liver-cells have the same chemical effect as the liver-cells of the *Vertebrata*; and shows by chemical experiments that the so-called lime-cells contain no phosphate of calcium: Biol. Centralbl. iii. pp. 323–327.

In a later communication, Barfurth states that glycogen is found in the liver of land snails only some time after they have taken nourishment, first in the cells of the intermediate substance (Zwischensubstanz), later, and after abundant food, also in the liver- and ferment-cells; it makes its appearance about seventeen hours after feeding, and disappears entirely after one to three days of fast. Zool. Anz. 1883, pp. 652–655.

E. Bonardi discusses the power of the saliva in land shells to transform starch into sugar, and the functions of the liver of the same; Boll. scient. iii. pp. 83–86.

The presence of free sulphuric acid in the salivary glands of *Dolium galea* is also confirmed by R. Maly, SB. Ak. Wien, lxxxi. Abth. 2 [1880] pp. 376–385 [omitted from Zool. Rec. xvii.].

3. *Circulation.*

B. Haller describes the heart of *Fissurella* and *Haliotis*; its muscle-fibrillæ are ramified, but not transversely striated; Morph. JB. ix.

H. Griesbach defends the existence of "pori aquiferi" as distinct from the openings of glands, and describes anew the communication of the ventral furrow in the foot of *Mytilus* with the internal lacunar blood-cavities; Zool. Anz. 1883, pp. 515–518. J. T. Cattie, however, states that he could never find distinct "pori aquiferi" in *Anodonta*, *Mytilus*, and *Arca*; l. c. pp. 561 & 562.

Critical notes on Griesbach's paper by J. Carrière, who is inclined to deny the reception of water by distinct openings; Zool. Anz. 1883, pp. 250–253. J. Kollmann maintains the existence of open communications between the intercellular openings, which contain hæmolymph,

and the outside in the foot of the Bivalves; these are either macroscopic, as in the *Unionidæ* and in *Pecten*, or microscopic, as in *Cyclas* [*Sphærium*]; they may lie in the byssal furrow, as in *Mytilus* and *Pinna*, near the byssal glands, but are distinct from them, and the existence of these communications is proved, according to him, by injections without rents of the glands. Verh. Ges. Basel, vii., 29 pp.

T. Barrois's paper on the same subject [title, *suprà*] has not been seen by the Recorder. L. Joliet also states, from observations made in the Heteropods, that the chief function of the renal sac is to expel the water which has been admixed with the blood; C.R. xcvii. pp. 1078–1081.

Open communications ("Poren-kanäle") between the intercellular spaces within the skin and its outside are described in *Helix pomatia* and *hortensis* by A. Nalepa, SB. Ak. Wien, lxxxviii., Abth. 1, pp. 1180–1188, pl.; abstract in J. R. Micr. Soc. (2) iv. p. 208.

4. *Excretion and Secretion.*

Diffuse form of the renal organ observed in some Mollusks by S. Trinchese, Arch. Ital. Biol. iv. pp. 18–21.

On the renal organs of *Patella*; J. T. Cunningham, Q. J. Micr. Sci. xxiii. pp. 369–375.

J. F. van Bemmelen confirms the existence of renal orifices in the pericardium in *Chiton marmoreus*, *C. marginatus*, and *Chitonellus fasciatus*, already stated by Sedgwick, but denied in other species by B. Haller; Zool. Anz. 1883, pp. 340–343. B. Haller maintains his statement that in *Chiton siculus* and *fascicularis* no such orifice exists; *l. c.* pp. 509–513.

J. T. Cunningham describes the kidney of *Aplysia*. It is situated beneath the shell, and has an external opening below the line of attachment of the gill, expanding and contracting in the living animal. Internally it is divided by flat trabeculæ of connective tissue, and communicates with the pericardial cavity. It corresponds morphologically with the left renal organ of the *Scutibranchia* and *Patella*. MT. z. Stat. Neap. iv. pp. 420–428, pl. xxx.

The renal organ of the oyster is described by J. A. Ryder, Bull. U. S. Fish. Comm. ii. pp. 345–347, and also incidentally by P. P. C. Hoek. It consists of numerous channels which not only extend to the surface of the body, but penetrate parts of the mantle; its orifice is a lateral slit in the anterior and inferior part of the main part of the body, a little behind the genital orifice, which is situated in the same slit; its cavity communicates with that of the pericardium by the reno-pericardial channel, and the auricles of the heart have probably also an excretory function. Tijdschr. Nederl. Dierk. Ver. Suppl. i. pp. 54–74.

Pedal gland, homologous to the byssal gland of the Bivalves, found by several *Limnæidæ* and *Paludinidæ*; P. B. Sarasin, Arb. z. Inst. Würzb. vi. pt. 2, pp. 105–108.

The glands on the edge of the mantle or cover of the gills in *Aplysia* are described by F. Blochmann, Z. wiss. Zool. xxxviii. pp. 411–418, pl. xxii.

5. *Nervous System.*

W. Vignal gives a general description of the anatomical arrangement and microscopical structure of the nervous system in the *Mollusca*, which he has studied chiefly in *Helix pomatia* and *hortensis*, *Limax maximus*, *Arion empiricorum*, *Paludina vivipara*, *Limnæa stagnalis*, *Aplysia depilans*, *Pecten maximus* and *opercularis*, *Anodonta cygnea*, and *Mya arenaria*. The ganglion-cells are mostly unipolar; bi- or multipolar ganglion-cells are very rare, especially in the Gastropods. The microscopical structure of the sympathic (or, as he terms them, "myenteric") nerves is entirely similar to that of those regulating the animal functions. Arch. Z. expér. (2) i. pp. 326–342 & 289, pl. xvi.

Arrangement of the nervous system of the adult *Bythinia tentaculata* described by P. B. Sarasin in his history of development of that species; Arb. z. Inst. Würzb. vi. pt. 2, pp. 41–43.

B. Haller describes the nervous system of *Fissurella*, *Haliotis*, and several *Trochidæ*, especially *Turbo rugosus* (L.), with several critical remarks on Ihering's paper [Zool. Rec. xiii. *Moll.* p. 18]. The transverse commissures between the pedal nerves are, according to him, not inherited from the *Vermes*, but acquired in the Molluscan division independently, as in the lowest of them, viz., the *Chitonidæ*, they form an irregular network. Morph. JB. ix. pp. 1–98, 7 pls. Short abstract in J. R. Micr. Soc. (2) iii. p. 828; a more full abstract in JB. mal. Ges. vi. [1884] pp. 301–304.

H. Wegmann and Lacaze-Duthiers discuss the nerve-strings in the foot of *Haliotis*, and come to the conclusion that the epipodium is a dependence of the mantle; C.R. xcvii. pp. 274–277.

6. *Organs of Sense.*

The visual organs in *Solen* described by B. Sharp, P. Ac. Philad. 1883, p. 248.

H. Simroth again discusses the different opinions as to the sense of smelling in land snails, and comes to the conclusion that the chemical senses, smell and taste, are united and seated in the whole skin, but more specialized in the feelers, and especially in the orifice of the pulmonary organ; JB. mal. Ges. x. pp. 23–30.

The olfactory organ of Spengel discovered also in *Nautilus* by Lankester & Bourne, Q. J. Micr. Sci. xxiii. p. 340.

Sensitive cells found in the base of the tentacles in the *Limnæidæ*, the upper feelers of the terrestrial *Pulmonata*, and the oral cavity of *Helix* and some *Limnæidæ*; Spengel's olfactory ganglion found in *Helix personata*, but in no other terrestrial Pulmonate. The former are wanting in all fresh-water *Prosobranchiata* which the author has had occasion to examine. P. B. Sarasin, Arb. z. Inst. Würzb. vi. pt. 2, pp. 91–108, 1 pl.

Cup-shaped sensitive cells in the oral cavity of *Fissurella* and *Haliotis*; B Haller, Morph. JB. ix. In that of *Chiton*; id. Arb.

z. Inst. Wien, v. pt. 1. The absence of auditory organs in *Chiton* stated; *id. ibid.*

Sensitive organs on the side of the foot along a furrow which begins behind the eye in the *Scutibranchia*, and compared with the lateral line of fishes; B. Haller, Morph. JB. ix. pp. 1–98; abstract in J. R. Micr. Soc. (2) iii. p. 829.

7. *Organs of Generation.*

Paired genital ducts in *Nautilus*; Lankester & Bourne, Q. J. Micr. Sci. xxiii. p. 340.

Some notes concerning the structure of the testicle and the formation of the spermatozoids in the *Chitonidæ*; J. F. van Bemmelen, Zool. Anz. 1883, pp. 343, 344, & 361.

P. P. C. Hoek elaborately describes the anatomy of the genital organs of the common oyster. After discussing the results and conclusions of previous authors, he gives the results of his own researches on individuals from the Oosterschelde, among which the following may be here mentioned:—The genital gland is not a compact organ, but forms a number of anastomosing channels, which extend nearly over the whole main part of the body within the connective tissue below the surface; the spermatozoids and eggs have their origin near each other in cœcal appendages of these channels, probably both from the ectoderm, but not at the same time; each egg is probably a transformed entire epithelial cell; each mother-cell of a spermatozoid, however, is only part of an epithelial cell. The genital orifice is situated in a lateral slit of the anterior and inferior part of the body. The eggs are fecundated in the genital channels by spermatozoids originating from another individual, which have been carried by the water-currents not only into the mantle-cavity, but into the genital opening itself. Oysters, when two years old, are able to produce either eggs or spermatozoids, but their fecundity is greatest in their fourth or fifth year, and decreases afterwards, the liver increasing in size and encroaching on the room occupied by the genital channels. During one season, nearly all the eggs of an individual are produced and hatched simultaneously; the production of the spermatozoids follows that of the eggs in the same individual, and continues for some time; aged individuals produce some spermatozoids, but no eggs. Artificial breeding very probably exercises a disadvantageous influence on the fertility of the individuals. Tijdschr. Niederl. Dierk. Ver. Suppl. i. pp. 115–253 (in Dutch and French), pls. i.–v.; abstract in Bull. U. S. Fish Comm. ii. p. 343, and in J. R. Micr. Soc. (2) iii. pp. 41, 354, & 355.

J. A. Ryder confirms the opinion that the common European oyster is hermaphroditic, spermatozoids or eggs predominating at certain ages and seasons; *O. virginiana* and *angulata*, on the contrary, are monœcious or unisexual: Bull. U. S. Fish. Comm. ii. pp. 205–215. Bouchon-Brandely's papers on the same subject [Zool. Rec. xix. *Moll.* p. 95] are translated; *l. c.* pp. 319–341.

Two kinds of spermatozoids observed in *Paludina vivipara* (as already stated by Von Siebold and Leydig) and in *Ampullaria*, one hair-like, the

other worm-shaped; the former only is essential for the fecundation of the egg, the other is the result of a less numerous partition of cells, and is to be regarded as homologous to the eggs in the female individual. M. v. BRUNN, Zool. Anz. 1883, pp. 89–92.

8. *Embryology.*

The embryonal development of *Aplysia limacina* (L.) is described by F. BLOCHMANN, Z. wiss. Zool. xxxviii. pp. 392–410, pls. xx. & xxi. The most interesting observation on which he dwells is that the blastopore, being a long cleft, gives origin to the mouth as well as to the anal opening; this will reconcile the otherwise contradictory statements made by other authors, that the blastopore gives in one animal origin to the mouth, and in another to the anal opening. Abstract in JB. mal. Ges. xi. [1884] p. 292.

C. RABL has observed in *Paludina vivipara* that the gastrula mouth or blastopore closes completely, and is not connected in any way with the anus, which makes its appearance somewhat after its closure, and that the permanent mouth appears still later on the same spot. SB. Ak. Wien, lxxxvii. Abth. 3, pp. 45–60; preliminary note in Anz. Ak. Wien, January, 1883, p. 13; abstract in Ann. N. H. (5) xi. p. 222, and J. R. Micr. Soc. (2) iii. p. 192.

Abstract of P. B. SARASIN'S paper on the development of *Bithynia tentaculata* in J. R. Micr. Soc. (2) iii. pp. 36–38, and JB. mal. Ges. xi. [1884] pp. 294–298.

Observations on the structure of the velum, the origin of the upper œsophageal ganglion, the structure of the primitive kidneys, and the development of the persistent kidneys, in *Bithynia tentaculata*; C. RABL, SB. Ak. Wien, lxxxvii. Abth. 3, pp. 50–55, with a plate; abstract in Anz. Ak. Wien, January, 1883, p. 13, and J. R. Micr. Soc. (2) iii. p. 193.

On the first stages of development in *Aplysia*; L. DE MANFREDI, Atti Acc. Nap. ix., App. No. 3 [not seen by Recorder].

A. KOWALEWSKY describes the first stages of development in *Chiton polii* (Phil.) and *Dentalium*. He comes to no general conclusions upon the former, but observes as to the latter that the segmentation is very like that of the Bivalves, the invagination resembling that of *Chiton*; the shell-gland makes its appearance very early, the middle part of the intestine is formed by invagination, and the cerebral and pedal ganglions originate from the ectoderm, the former by invagination of the sincipital plate; the larva of *Dentalium* externally somewhat resembles that of the Annelids, but differs internally wholly from them. Ann. Mus. Marseille, i. Nos. 5 & 7, 92 pp., 16 pls.

H. ROUZAUD publishes some observations on the development of the generative organs in the *Pulmonata*; C.R. xcvi. pp. 273–276; abstract in J. R. Micr. Soc. (2) iii. p. 192.

J. LEIDY states that the weight of the embryos in the gills of a single *Anodonta fluviatilis* was 56·66, and in another specimen 40·43 grammes, whereas the weight of the animal without embryos was 78·78 and 73·45 grammes. P. Ac. Philad. 1883, pp. 44 & 45; also Science, i. p. 150.

9. *The Shell Generally.*

H. L. Osborn has inserted pieces of glass between the outside of the mantle and the inside of the shell of living oysters, and studied the thin deposits of shelly matter found on them after twenty-four and forty-eight hours, and later. His observations confirm the opinion that the shell is formed by the crystallization of the lime in the chitinous sheet, and that the form of the lime is not an internal cast of that sheet. Young shells of two months average from three-fourths of an inch to an inch in length, and often weigh 3-4 grammes. Stud. Lab. Johns Hopkins Univ. ii. No. 4, pp. 427–432, pl. xxxiv.; abstracts in Ann. N. H. (5) xi. pp. 149 & 150, and J. R. Micr. Soc. (2) iii. p. 195.

C. F. W. Krukenberg makes researches into the chemical nature of the colouring matter in the shells of *Mollusca*, and states that the red and green pigments in some species of *Haliotis*, *Turbo*, and *Trochus* is either biliverdine or nearly allied to it, and that many red, yellow, or brown pigments in the shells of Gastropods as well as Bivalves belong to the so-called lipochromoids and melanoids. Centralbl. med. Wiss. 1883, No. 44.

10. *Biology.*

H. A. Coutance has experimented upon the resistance of 5 species of *Mollusca* against solutions containing only one or an excess of one of the constituents of normal sea-water, chiefly chlorides of magnesia or potash and sulphate of magnesia. Each of these is eventually fatal, but there is a great difference in the rate of the toxic action of any one solution upon the same animal, and a great range in the resistance of different Mollusks to the same solution. The salts of soda and magnesia are less fatal than those of potash. *Venus* (*Tapes*) *decussata* showed a vitality far surpassing any other species, and, generally, Bivalves resisted longer than Gastropods, *Litorina* longer than *Buccinum*. Am. Nat. xvii. p. 1079.

Pulsations of *Helix rufescens* 5–6 in a minute just below freezing point; it retires for hibernation at a temperature of 38°–40°: F. Ashford, J. of Conch. iv. p. 13.

Some species of snails found in activity in mid-winter; F. Wiegmann, Nachr. mal. Ges. 1883, p. 60.

Slime-spinning observed in *Arion hortensis* (Fér.); W. Denison Roebuck, J. of Conch. iv. p. 82. In *Ancylus lacustris* (L.); T. D. A. Cockerell, *l. c.* p. 127.

Achatinella. H. Glanville Barnacle confirms that these snails produce musical sounds, somewhat like an Æolian harp, by grating their shell against wood; J. of Conch. iv. p. 118.

A specimen of *Unio* clasping the under-jaw of *Chelydra* for three days; Todd, Nachr. mal. Ges. 1883, p. 93.

Boring Bivalves. M. E. Wadsworth suggests that the siliceous grains found by Hancock about the foot and mantle of rock-boring Mollusks (Ann. N. H. 2, ii.) may be the result and not the cause of the rock excavation; Dall, Science, i. p. 422.

Fresh observations on the parasitism of the liver-fluke, *Distoma hepaticum*, in *Limnæa truncatula*, the *Cercariæ* leaving the snails, and encysting themselves on a blade of grass, by A. P. Thomas, Q. J. Micr. Sci. January, 1883 ; abstract in J. of Conch. iv. pp. 10–12.

Leidy has observed on the gills of the North American *Anodonta fluviatilis*, a mite which he declares to be identical with that found on European *Anodontæ*, viz., *Atax hypsilophorus* (Bonz.) ; P. Ac. Philad. 1883, pp. 44 & 45 ; abstract in Ann. N. H. (5) xi. pp. 391 & 392, Science, i. p. 150, and Nachr. mal. Ges. 1883, p. 116.

11. *Abnormities.*

An instance of closure of the external genital opening in *Helix pomatia*; C. Mangenot, Bull. Soc. Z. viii. pp. 130–133.

The green colour in oysters is due to staining of the blood-cells, and is sometimes most intensive in the hepatic follicles ; it may be caused by the food ; the author very much doubts whether it may be chlorophyll, and rejects altogether the idea that it is produced by *Diatomaceæ* : J. A. Ryder, Am. Nat. xvii. pp. 86–88 ; abstract in J. R. Micr. Soc. (2) iii. p. 194. Oysters with green-coloured gills are not hurtful to man ; *id.* Bull. U. S. Fish. Comm. iii. p. 294.

White varieties of *Limnæa palustris*; Morris, J. of Conch. iii. p. 392. Of *Planorbis nitidus* and *spirorbis*, *Limnæa peregra* ; Nelson, *op. cit.* iv. p. 19. Of *Helix lapicida*; Hele, *l. c.* p. 27. Of *Zonites fulvus*, *Helix virgata* and *cantiana*, *Succinea elegans*, and *Planorbis lineatus*, pp. 28–37, *Pupa marginata*, p. 44, *Helix hortensis*, p. 53, *Bulimus obscurus*, pp. 83 & 84, *Physa fontinalis*, p. 84, *Helix rotundata*, p. 125 ; Taylor, *l. c.*, all British. (See also Roebuck, *l. c.* p. 117.)

Sinistral specimens of *Helix aspersa*, *hortensis*, and *virgata*, *Planorbis complanatus*, and *Valvata piscinalis*, all British, Taylor, J. of Couch. iv. pp. 35–37 & 100; of *Helix ericetorum* (Müll.), Weinland, JH. Ver. Württ. 1883, p. 121 ; *H. quimperiana* (Fér.), Daniel, J. de Conch. xxxi. p. 380 ; *H. lychnuchus* (Müll.), Mazé, *l. c.* p. 12, pl. i. fig. 5.

Scalarid of *Helix nemoralis*, British, Taylor, J. de Conch. iv. p. 53; of *H. aspersa*, id. *l. c.* p. 101 ; of *Planorbis complanatus* [*marginatus*], id. *l. c.* p. 128 ; *P. rotundatus* in Belgium, J. de Guerne, P.-v. Soc. mal. Belg. xii. p. vi.

Bulimoid deformation of *Helix pomatia*, caused by a fracture on the beginning of the third whorl ; Crosse, J. de Conch. xxxi. p. 401, pl. x. fig. 7.

Malformed specimens of *Limnæa peregra* in large proportion to the whole number, most of them having added a quarter or one half a whorl after forming an expanded lip ; W. Nelson, J. of Conch. iv. p. 80.

F. C. Noll states that the shells of *Limnæa truncatula*, *Bithynia tentaculata*, and *Planorbis nitidus* become eroded and of carious appearance even in young animals, if kept alive in confinement in an aquarium, and he found that the eroded spots were occupied by numerous specimens of *Micrococcus*, which he therefore thinks the cause of the alteration ; Zool. Gart. xxiii. [1883] pp. 157–159.

Peculiar clefts in the columella of fossil species of *Natica*; E. Beyrich, SB. nat. Fr. 1883, pp. 3 & 45. Somewhat similar ones in recent shells of *Buccinum* caused by the Cirriped *Alcippe*; E. v. Martens, *l. c.* p. 45.

GEOGRAPHICAL DISTRIBUTION.

a. Land and Fresh-water Mollusca.

1. *Palæarctic Region generally.*

W. Kobelt admits the following Malaco-geographical zones and provinces in Europe and the adjacent countries :—

1. Arctic-boreal zone.
2. German zone.
3. Alpine zone. (A) Iberian or Pyrenean province; (B) Alpine s. str.; (C) Balkan; (D) Transsylvanian; (E) Caucasian province.
4. Mediterranean zone. (A) Mauritanian province, including also a part of Spain; (B) Italian; (C) Grecian; (D) Province of Asia Minor; (E) Syrian province.

He further discusses the probability of former connections by land between Europe and Africa, applying the testimony of the present distribution of terrestrial *Mollusca* to this question, and concluding that a former communication by land between Carthagena and Oran is beyond doubt, one between Sicily and Tunis questionable, and one between Turkey in Europe and Asia Minor, including the Sporades, probable. The chief testimony for the first of these opinions is that many species of Carthagena and Oran are identical, and that some species which are found nearly on all coasts of the Mediterranean are wanting westwards of Oran and Carthagena. JB. mal. Ges. x. pp. 97–114.

The same author gives many additions to the second edition of his "Catalog der in europäischen Faunengebiet lebenden Binnenconchylien," consisting chiefly of supposed new species by Bourguignat & others, new subgenera and species of *Clausilia* by Böttger, novelties from Sicily by Benoit, &c.; Nachr. mal. Ges. 1883, pp. 1–25.

W. Kobelt continues to illustrate little-known or new land shells from Southern Europe and the North Coast of Africa in his "Iconographie" (2) i. pp. 33–56, pls. xi.–xx. Species not before figured will be mentioned *infrà*.

2. *Northern Russia.*

W. Dybowski gives a list of the literature of the Russian land and fresh-water shells, and enumerates the known localities of *Paludina vera* [*listeri*, Forbes] and *fasciata* (Müll.) in European Russia; Mal. Bl. (2) vi. pp. 82–86. [These lists are somewhat incomplete. The author does not mention the shells found by Ehrenberg, and enumerated in SB. nat.

Fr. 1875, p. 89 ; nor those by Polenoff, *op. cit.* 1878, p. 82 ; nor Milachevich's paper in Bull. Mosc. lvi. (1881).—Rec]

Russian Baltic Provinces. 62 terrestrial and 46 fresh-water species enumerated by M. Braun, Nachr. mal. Ges. 1883, pp. 174–181.

8. *British Fauna.*

A new list of British land and fresh-water *Mollusca*, enumerating 46 species of the latter and 86 of the former, with many varieties, is given by the Conchological Society in J. of Conch. iv. pp. 43–52.

New varieties of several British species described by W. Nelson, J. of Conch. iv. pp. 25 & 26 ; J. Taylor, *l. c.* pp. 28–37, 53, 68, 82, 84, & 127 ; and Butterell, *l. c.* p. 65. *Helix arbustorum*, a new variety for England ; Scot. Nat. (2) i. p. 57.

Peterborough. Several species exhibited by T. W. Bell, J. of Conch. iv. p. 14.

Isle of Man. The like, by W. Nelson ; *l. c.* p. 15.

Carnarvon. 26 species enumerated by D. Roebuck, *l. c.* pp. 113–115.

Flintshire. Notes by the same, *l. c.* p. 126.

Yorkshire. Land and fresh-water *Mollusca* enumerated by W. Nelson & J. W. Taylor, Tr. Yorksh. Nat. Un. i. pp. 1–16 & 17–32. Conchological field-notes from Wensleydale by W. D. Roebuck, Naturalist, viii. pp. 81–87 & 124 ; from South Melford by G. Roberts, *op. cit.* ix. pp. 87 & 88. *Planorbis lineatus* in Yorkshire, Roebuck ; J. of Conch. iv. p. 13.

Oxford. Notes by S. Spencer Pearce, Zool. (3) vii. pp. 362–370.

Jersey. Some species of land snails mentioned by E. Duprey, Ann. N. H. (5) xi. p. 189.

Notes on British land and fresh-water *Mollusca* from various localities by W. Cash, H. Slater, L. B. Ross, J. W. Taylor, J. W. Candall, Jeffrey, and others, J. of Conch. iv. pp. 17, 65–68, 81, 106, 107, 118, & 125.

Testacella haliotidea (F. B.). Note on its occurrence in England by J. D. Butterell & J. W. Taylor, J. of Conch. iv. p. 67, and T. S. Hillman, *l. c.* p. 115 ; in Yorkshire, W. D. Roebuck, Naturalist, ix. p. 70 ; in Monmouthshire and South Wales, J. E. Lowe, Rep. Brit. Ass. 53rd Meeting, 1883, p. 549.

Limax cinereo-niger (Wolf) new to England ; W. D. Roebuck, Zool. (3) vii. p. 304, and Naturalist, ix. p. 68. Notes on other British slugs ; *id.* J. of Conch. iv. pp. 38–43, 55, & 125, also Zool. (3) vii. p. 507.

Helix pomatia (L.) found on the chalk downs near Epsom and the chalk hills near Reigate and Dorking ; P. H. Stokoe, Nature, xxviii. p. 6. The counties in which this species are found are continuous to one another from Kent and Sussex to Gloucester and Northampton; it is more common on chalk soil : W. C. Atkinson, *l. c.* p. 81. [See also Zool. (3) vii. pp, 342–345.]

Paludina vivipara (L.) is not known to occur either in Scotland or Ireland ; Taylor, J. of Conch. iv. p. 116.

4. *France.*

Paris. T. Jousseaume enumerates 8 species of *Clausilia*, 2 *Chondrula*, 5 *Pupa*, 4 *Vertigo*, and 1 *Carychium*, as found in the environs of Paris, of which *P. quinquedentata* is very doubtful as to locality; Bull. Soc. Zool. 1882, pp. 430–495, pl. xii.

Brest. 60 terrestrial and 31 fresh-water species, including *Unio margaritifer* and *littoralis*, 3 species of *Testacella*, *Helix quimperiana* (Fér.), &c., enumerated by F. Daniel, J. de Conch. xxxi. pp. 246, 253, 352, 353, & 371–387.

La Rochelle. List of 56 terrestrial and 39 fresh-water species collected by L. Piré, Ann. Soc. mal. Belg. xvii. 1882 [1883], p. 23.

Rochefort-sur-mer. Land and fresh-water shells by G. Regelsperger, C.R. Ass. Fr. Sci. (Rochelle) 1882.

Dép. Lozère. The catalogue of the terrestrial and fresh-water *Mollusca* of this Department [mentioned Zool. Rec. xviii. *Moll.* p. 20] is published in Bull. Soc. Toulouse, xi. [1878], and contains 70 terrestrial and 15 fresh-water species. [See Mal. Bl. (2) vi. p. 149.]

Pyrenees. P. Fagot enumerates all publications containing scientific notes on Pyrenean land or fresh-water shells, with lists of the species cited, and critical remarks on some of them. This enumeration is arranged according to political Departments, and is contained in Bull. Soc. Toulouse, 1879–82, but is also published separately under the title, "Histoire malacologique des Pyrénées françaises," in six parts. The first, relating to the Dép. Pyrénées Orientales, has been already mentioned in this Record [xvii. *Moll.* p. 22]; the fifth, relating to the Dép. Hautes Pyrénées, is preceded by a systematic list of all species known in this Department, amounting to 59, including *Margaritana margaritifera* and some new species. Pic du Gar, Dép. Haute-Garonne: 23 terrestrial, including 3 new, and 3 fresh-water species enumerated by P. Fagot, Bull. Soc. Toulouse, 1882, 15 pp. (also separately).

Dép. Var. Mollusks enumerated by P. Bérenguier [title, *suprà*].

5. *Central Europe.*

Aeltre, in East Flanders. List of land and fresh-water shells by P. Pelseneer; P.-v. Soc. mal. Belg. xii. pp. xxvii.–xxx.

Maestricht. By C. Ubaghs, *l. c.* pp. lxxxvii.–xcii.

Plain of N.W. Germany, between Ems and Elbe. 63 terrestrial and 69 fresh-water species, with numerous varieties, full synonymy, and historical notes, enumerated by F. Borcherding, Abh. Ver. Brem. viii. pp. 255–366 & 551–557. The following may be mentioned as more remarkable, and of less general distribution:—*Limax unicolor* (Heynem.), *variegatus* (Drap.), *tenellus* (Nilss.), *Vitrina heynemanni* (Koch), *major* (Fér.), *Hyalina draparnaldi* (Beck), *alliaria* (Mill.), *petronella* (Charp.), *Helix granulata* (Ald.), *liberta* (Westerl.), *cantiana* (Mont.), *aspersa* (Müll.), in gardens, introduced, *Limnæa glabra* (Müll.), *Amphipeplea glutinosa* (Müll.), *Planorbis clessini* (Westerl.), *Sphærium solidum* (Norm.),

Pisidium roseum (Scheltz.). Only 2 species of *Clausilia*, *nigricans* and *laminata*, are among them.

Harz. Some rarer species, including *Amalia marginata* (Drap.) and *Clausilia cana* (Held), mentioned by P. HESSE, Nachr. mal. Ges. 1883, pp. 44–46.

Frankfort-on-the-Oder. 43 terrestrial and 30 fresh-water species enumerated by E. HUTH, Monat. Mittheil. d. naturwiss. Vereins d. Reg. Bez. Frankfurt, No. 3, Dec. 1883, pp. 39–43.

Silesia. 38 terrestrial and 36 fresh-water species collected near Rosenberg and Creuzburg, including *Clausilia cana* (Held), *Succinea elegans* (Risso), *Planorbis vorticulus* var. *acies* (Villa), *Valvata macrostoma* (Steenbach), and *Sphærium scaldianum* (Normand); no *Buliminus* mentioned: O. GOLDFUSS, Nachr. mal. Ges. 1883, pp. 33–44. Some rather rare and remarkable land shells found on Mount Zobten, as *Helix obvoluta*, *solaria*, *Balea fragilis*, *Clausilia commutata* and *filograna*, and *Pupa alpestris*, discussed by E. MERKEL, Nachr. mal. Ges. 1883, pp. 150–153.

Galicia. J. BAKOWSKI enumerates the *Mollusca* found near Lemberg, Grodek, Sczerca, Kolomea, Mikuliczyn, Zabie, and the Czernahora (Carpathians), in Sprawozd. Kom. fizyogr. xvi. [1882] pp. (56–63) & (130–140). B. KOTULA enumerates shells from Przemysl and the river San; *l. c.* pp. (100–129).

Province Hesse-Cassel. 37 species of land shells, including 2 species of *Daudebardia* and *Cionella tridens*, and only 1 fresh-water shell, *Ancylus fluviatilis*, found in the Ahne Valley, enumerated by F. H. DIEMAR, Nachr. mal. Ges. 1883, pp. 74 & 75. Notes on rather rare shells found at Zierenberg, near Cassel; *id.* Ber. Ver. Cassel, xxix. [1882] & xxx. p. 42.

Grand Duchy Hesse. 33 fresh-water and 43 terrestrial species observed near Giessen by K ECKSTEIN; *Limnæa stagnalis* and *Planorbis corneus* found near Giessen, but entirely wanting in the narrow valley of the Lahn, beneath that town: xxii. Ber. oberhess. Ges. pp. 187–193. 34 terrestrial and 15 fresh-water species found near Darmstadt; *Buliminus detritus* only on löss and sandy ground, not on the Old Red Sandstone: A. KÖHLER, Notizbl. Ver. Erdk. Darmstadt (4) iii. [1882] pp. 1–6.

Baden. O. NÜSSLIN, in a contribution to a larger geographical work, gives an account of the *Mollusca* found in the Grand Duchy of Baden, 94 terrestrial and 46 fresh-water species, and subdivides them according to geognostical and hydrographical differences of their abode. "Das Grossherzogthum Baden," Karlsruhe: 1883, i. pp. 19–21.

Schönthal, in Württemberg. 55 terrestrial and 20 fresh-water species, including some new for the region, and 2 new species of *Vitrella*, collected by C. Weinland, enumerated by D. WEINLAND, JH. Ver. Württ. 1883, pp. 112–127.

Bohemia. 69 terrestrial and 40 fresh-water species found in the Northern part of Bohemia, including some not before known from that country, viz., *Helix solaria* and *bielzi*, *Clausilia orthostoma* and *filograna*, by A. SCHMIDT, in a Report of a primary school in Böhmisch, Leipa, 1881. LADISLAS DUDO has published (in Czech) an analytical enumeration of the Bohemian *Mollusca*. Prag: 1810; *cf.* Mal. Bl. (2) vi. p. 136.

Moravia. ULICNY's list of *Mollusca* found near Brünn [mentioned Zool. Rec. xix. *Moll.* p. 12], 22 pp., with a plate, enumerates 70 terrestrial and 27 fresh-water species; the more remarkable among them are *Daudebardia rufa* and *heldii*, *Hyalina glabra*, *Helix solaria*, *rupestris*, *bidens*, *unidentata*, *liberta* (figured), *sericea*, *granulata* (fig.), *transsylvanica* (fig.), *carpatica*, *candicans*, *austriaca* (but no *nemoralis*), *Buliminus tridens*, *montanus*, *Pupa doliolum*, *alpestris* (fig.), 8 species of *Clausilia*, *Paludina vivipara* (no *fasciata*), *Paludinella austriaca*, and *Sphærium corneum* var. *scaldianum* (fig.). The great majority of the species are also found in most parts of Middle and South Germany.

Upper Hungary. Malacological notes by J. HAZAY. The trachytic regions nourish many slugs, but only few shells, and in some spots none of the latter could be found. The limestone regions are much richer in land shells; *Helix lutescens* and *faustina* have been found only here. *Helix pomatia* is confined in some regions to the ruins of old castles. The springs of 10°–12° R. nourish *Lithoglyphus pannonicus*; those which are somewhat colder, *Bythinella tornensis* (Haz.). Mal. Bl. (2) vi. pp. 88–109.

Switzerland. Notes on the occurrence of some rarer species of shells, especially *Hyalina*, and a new *Pupa*, by STERKI, Nachr. mal. Ges. 1883, pp. 71–74. Additions to a former list of shells found near Solothurn [Zool. Rec. xviii. *Moll.* p. 21], by J. BLUM, *l. c.* pp. 162 & 163. Notes on the shells found at St. Moritz, Viamala, Geneva, Lausanne, and on the Rigi, by R. M. CHRISTY, J. of Conch. iv. pp. 56–60.

St. Bernard, Mont Cenis, &c. Some terrestrial shells, found by H. Simon, enumerated by O. BÖTTGER, Ber. offenb. Ver. xxii. pp. 157–161.

Southern Tirol. Malacological notes on the environs of Ratzes, near Schlern, and the occurrence of several species in the Dolomitic parts of the Alps of Tirol, *Pupa inornata*, *Vitrina annularis*, and *Helix arbustorum* var. *rudis*, being confined to the Dolomites, and *Helix preslii* nearly so, by V. GREDLER in Prossliner's "Das Bad Ratzes in Südtirol," 1883, pp. 62–64, taken from a Programme of the Gymnasium in Bozen by V. GREDLER in 1863.

Transsylvania. M. v. KIMAKOWICZ gives a new systematic list of the land snails of this country, which differs from the second edition of Bielz's Fauna, chiefly in the introduction of subgeneric names, somewhat more quotations from older and foreign authors, and somewhat different opinions concerning varieties and species; Verh. siebenbürg. Ver. xxxiii. 73 pp.

6. *Southern Europe and Shores of the Mediterranean.*

Northern Spain. Malacological excursions at Bilbao and Orduna described by W. KOBELT, JB. mal. Ges. x. pp. 201–212.

Gibraltar. 20 species, some new, collected by W. KOBELT, J. of Conch. iv. pp. 1–9.

H. DROUET describes, in a special pamphlet, 80 species of *Unionidæ* from Italy, including several new species and many others regarded by

former authors as varieties ; but as none are figured, identification is not easy. F. R. Bourguignat also publishes a pamphlet of 117 pp. on the same subject.

Upper Italy. Malacological notes made on a voyage to Venice, Vicenza, Verona, and Val Sabbia, by V. Gredler, JB. mal. Ges. x. pp. 383–388. Shells collected at Brescia, in Val Trompia, on Lake Iseo, in Val Brembana, and near Varenna, with descriptions of 2 new species of *Acme*, and a comparison of the malacological fauna on the northern and southern side of the Alps, by A. Andreae, Nachr. mal. Ges. 1883, pp. 129–143. 102 species collected in the Valley of the Dora Baltea, in Piedmont, by L. Pegorari, Bull. Soc. Ven. Trent. ii. pp. 148–185.

Apuan Mountains, in the N.W. of Tuscany, and adjacent parts of the Apennines. 103 terrestrial and only 19 fresh-water species enumerated, and at length discussed, with descriptions of several new "forms," by Carlo de Stefani, Bull. Soc. mal. Ital. ix. pp. 11–212.

Istria and *Dalmatia.* 21 terrestrial and 7 fresh-water species collected by Von Lichtenstein, enumerated by A. Wimmer, Verh. z.-b. Wien, xxxii. pp. 263 & 264.

Crimea. 58 terrestrial and 11 fresh-water species, including 29 peculiar to the Crimea, 25 rather widely distributed in Europe, 5 more distinctly South-European, are enumerated by O. Retowski, Mal. Bl. (2) vi. pp. 1–34. The new ones described and figured by Clessin, *l. c.* pp. 37–52. Some others found on the beach of Feodosia, probably coming from Transcaucasia, enumerated by Retowski, *l. c.* pp. 53–61.

Transcaucasia. 79 land shells collected by H. Leder in Swanetia and Abkhasia, and several fresh-water shells from Lake Goktscha, enumerated and discussed, including several new, by O. Böttger, JB. mal. Ges. x. pp. 135–198, pls. iv.–vii.

Greece. P. Hesse enumerates a number of species and localities from older malacological authors and travellers omitted from Westerlund & Blanc's work on the land and fresh-water *Mollusca* of Greece ; the more interesting are those contained in Raulin's work on the Island of Crete: JB. mal. Ges. x. pp. 73–81. O. Böttger describes and discusses a number of land shells and a few fresh-water shells, collected by E. Reitter and E. Brenske, in Corfu, Cefalonia, Elis, Messenia, Corinth, and Attica ; JB. mal. Ges. x. pp. 313–344.

Greece and *Asia Minor.* The *Clausiliæ* collected many years ago by Vice-Admiral (then Captain) T. A. B. Spratt have been examined and described by O. Böttger, P. Z. S. 1883, pp. 324–343, pls. xxxiii. & xxxiv. They belong chiefly to the group *Albinaria.* The author enumerates, on this occasion, the Grecian Islands from which no *Clausilia* is as yet known.

Crete. New species of *Helix* by H. v. Maltzan, Nachr. mal. Ges. 1883, pp. 102–106 ; of *Clausilia*, by O. Böttger, *l. c.* pp. 106–112.

Syria. 50 terrestrial and 9 fresh-water species collected by F. Lange & E. Schumacher near Haiffa and in the Lebanon, enumerated and discussed by O. Böttger, Ber. offenb. Ver. xxii. & xxiii. pp. 162–176.

Lakes of Tiberias, Antioch, and *Homs.* Their fresh-water shells, including many supposed new species, described and many figured by A.

LOCARD, Arch. Mus. Lyon, iii. pp. 195–293, pls. xix.B–xxiii. In the Lake of Tiberias, the genera *Unio*, *Corbicula*, *Melania* (*tuberculata*), *Melanopsis*, and *Theodoxia* [*Neritina*], are represented; in that of Antioch, beyond the same, except *Melania*, also *Leguminæa*, *Pseudodon*, *Anodonta*, *Dreissena*, *Planorbis*, and *Limnæa*; in that of Homs, only *Unio*, *Leguminaia*, *Corbicula*, *Melanopsis*, and *Limnæa*. The species of *Unio* belong partly to the group of *U. litoralis*, partly to that of *terminalis* (Bourg.). The species of *Limnæa* are nearly similar to the European, viz., to *L. stagnalis*, *ovata*, *peregra*; one, from the Lake of Homs, is even admitted by the author as the European *L. lagotis*. *Corbicula syriaca*, sp. n., and *Melanopsis costata* (Oliv.), are common to all three lakes; some species of *Unionidæ*, *Melanopsis*, and *Neritina michoni*, to two of them. The author gives, pp. 201–203, a list of all known and some undescribed species of *Melanopsis*, hitherto found in the Turkish part of Asia (25 in all).

Cyrenaica (*Bengazi*). 12 terrestrial species (1 new) collected by G. Ruhmer, of which 8 are hitherto known on the northern coasts of the Mediterranean, 2 more westwards, and others more eastwards on its southern shore; E. v. MARTENS, SB. nat. Fr. 1883, pp. 147–149.

7. *Africa.*

Abyssinia. J. R. BOURGUIGNAT describes the shells collected by Achille Raffray in 1881, chiefly in the table-lands of Hamacen and Anderta, and on the mounts of Zebul and Abuna Yusef, at heights of 2000–3000 metres, and adds a general and very critical review of all land and fresh-water shells of Abyssinia, amounting to 167 species, with enumeration of their literature, and a general sketch of the physical conditions of the land. In several species of *Bulimus* [*Buliminus*] he finds some resemblance to the American species of the Andes [*Bulimulus*], due probably to a certain similarity of the climate. Only a few species of more general distribution are found, as, for example, *Opeas gracilis* and *Limnæa truncatula*. The author divides Africa into four zoogeographical regions:—(1) African centre, from the south of the desert to the twentieth degree of southern latitude; (2) Natalic centre, south of the preceding to the Cape of Good Hope; (3) Malgache centre, Madagascar, with radiations to the east coast of Africa and the south coast of Arabia; (4) Asiatico-European centre, north of the desert and both shores of the Red Sea. Ann. Sci. Nat. (6) xv. Nos. 1–4, 162 pp., 4 pls. and map.

Guinea. Some new terrestrial species, with a new genus of slugs, *Aspidelus*; Morelet, J. de Conch. xxxi. pp. 395–401, pl. x. 10 terrestrial and 1 fresh-water species from Landana, mouth of the Congo; CRAVEN, Ann. Soc. mal. Relg. xxvii. pp. 18 & 19.

Southern Tributaries of the Congo. 1 terrestrial and 4 fresh-water species collected in the Lualaba and neighbouring rivers by Lieut. Wissmann, none of the latter identical with Tanganyika species, 2 new; E. v. MARTENS, SB. nat. Fr. 1883, pp. 72–74.

Ukerewe and *Tanganyika Lakes*. *Melania tuberculata* (Müll.), *Vivipara abyssinica* (Martens), *Mutela subdiaphana* (Bourg., not yet described), and 7 new species of *Unio* from the former, 5 species of *Unio* already described by English authors, and the 2 peculiar genera, *Cameronia*, 1 sp., and *Burtonia*, 2 spp., from the latter, mentioned by Bourguignat, Moll. fluv. du Nyanza Oukerewe, &c., 23 pp., with 1 pl. 5 terrestrial and 5 fresh-water species collected in Tanganyika by R. Böhm, noted by E. v. Martens, none new, 1 known also in the Nile; SB. nat. Fr. 1883, pp. 71 & 72.

Socotra. The shells collected by Riebeck & G. Schweinfurth in 1881 reviewed in comparison with those by Balfour in 1880; 10 species of operculated and 22 of inoperculated land shells are now known from that island; the subgenera *Passamaiella*, *Achatinelloides*, and *Riebeckia* appear to be peculiar to it. The whole facies of the fauna agrees with that of continental Eastern Africa and of Arabia, which is itself rather African than Asiatic; only the 2 species of fresh-water shells found by Riebeck & Schweinfurth are of Indian character. E. v. Martens, Conchol. Mitth. ii. pp. 140–151, pls. xxviii. & xxix. The same also enumerated by O. Taschenberg, Z. ges. Naturw. (4) ii. pp. 169–171. 3 species of *Planorbis*, 1 of *Hydrobia*?, and 4 of *Melania*, collected by Balfour, described by H. H. Godwin-Austen, P. Z. S. 1883, pp. 2–8, pls. i. & ii.; the genus *Limnæa* is wanting in this island; the fresh-water shells have more of an Indian than African character.

Mayotte, Comore Islands. 70 terrestrial, 11 fresh-water, and 19 submarine species enumerated; most of them are peculiar species, and of minute size; the fauna has more resemblance to that of continental Africa and Madagascar than of Mauritius and Bourbon; 10 submarine species are common with Polynesia. Morelet, J. de Conch. xxxi. pp. 189-216, pl. viii.

8. *Asia*.

Chukchi Peninsula. 6 species of land shells and 1 fresh-water shell (*Physa*) collected by the brothers A. & A. Krause, discussed by the same, SB. nat. Fr. 1883, pp. 31–34.

Japan. The species of *Hyalina* and *Conulus* reviewed, with several new ones, and a new *Fruticicola*; Reinhardt, SB. nat. Fr. 1883, pp. 83–86.

China. The literature to Nov., 1882, of the Chinese land snails enumerated, and those collected by L. v. Loczy in the provinces Shensi and Kansu, some subfossil or fossil, described by V. Hilber, SB. Ak. Wien, lxxxvi. Abth. 1 [1882], pp. 313–352, 3 pls. A continuation of the same subject, including some species from Eastern Tibet, and some very remarkable forms of *Buliminus*; id. *op. cit.* lxxxviii. Abth. 1, pp. 1349–1392, pls. iv.–vi. M. Neumayr gives some notes on the fresh-water shells collected by the same traveller in Middle and Southern China, stating that there is much resemblance between the recent fresh-water shells of China and the Tertiary ones of Europe, but that *Melanopsis* and *Dreissena* are wanting in China, and pointing out a fresh-

water *Mytilus*; JB. Mineral. ii. pp. 21–26, woodcut. The known species of *Clausilia*, *Streptaxis*, *Ennea*, *Helicarion*, *Macrochlamys*, *Microcystis*, *Kaliella*, *Sitala*, *Nanina*, *Hyalina*, and *Plectopylis*, critically discussed, and several new added, as well as some *Cyclophoridæ*, by O. v. Möllendorff, JB. mal. Ges. x. pp. 228–269, 272–288, & 356–383, pls. viii., x. & xii. New species of land shells from Southern China; *id.* Nachr. mal. Ges. 1883, pp. 65–67 & 98–101. 3 new interesting species of *Clausilia* described by Gredler in a separate pamphlet. Some species of *Melania* collected by V. Möllendorff discussed by A. Brot, Nachr. mal. Ges. 1883, pp. 80–86. Heude continues to give very good figures and rather short descriptions of Chinese species of *Unio*, with many new names; Conchyl. fluv. fasc. viii. pls. lviii.–lxiv.

9. *Southern Asia.*

Godwin-Austen continues his valuable work on the land and fresh-water *Mollusca* of India, giving in the third part several additions to the genera *Kaliella* and *Sitala* and beginning a monograph of *Macrochlamys*, and treating in the fourth part the genera *Macrochlamys*, *Oxytes*, *Axiophanta*, and *Helicarion*, conchologically and anatomically; unfortunately, the colouration of the plates is rather coarse.

Ceylon. Some new species of fresh-water shells and a new *Vaginulus*, by C. A. Westerlund, Nachr. mal. Ges. pp. 49–58 & 164–166.

Salanga Island, Coast of Malacca. 13 terrestrial, 7 fresh-water, and 6 submarine species (*Auriculidæ*, *Potamides*) collected by Weber, agreeing about equally well with those of Transgangetic India as with those of the Malayan Archipelago, some new, enumerated by E. v. Martens, Conchol. Mitth. ii. pp. 129–132, pl. xxv.

Cambodia. New species by L. Morlet, J. de Conch. xxxi. pp. 104–109, pl. iv.

10. *Malayan Region and Australia.*

Celebes and *Moluccas.* C. Tapparone-Canefri enumerates and describes 7 terrestrial species from Celebes, 8 from Halmahera, 11 from Amboina, and some more from the "Moluccan Islands," without more precise statement of locality, all collected by Beccari and D'Albertis, including several new species and varieties; Ann. Mus. Genov. xx. pp. 143–175, pl. i.

New Guinea and *Aru Islands* Their land, fresh-water, and submarine Mollusks worked out by C. Tapparone-Canefri, chiefly from the collections made by Beccari and D'Albertis, but all species mentioned by author are enumerated. There are—*Paludinidæ* 3 species, *Melaniidæ* 5 new, *Neritidæ* 34, inoperculated true land shells (*Stylommatophora* exch. xx) 128, *Auriculidæ* 33, *Limnæidæ* 7, *Cyclophoridæ* (incl. *Pupinidæ*) 26, Onchidiidæ 9, *Assimineidæ* 1, *Truncatellidæ* 2, *Glaucomyidæ* 1, *Cyrenidæ* Sey3, *Unionidæ* (genus *Unio*) 4. Among the *Stylommatophora*, the section *Papuina* of the genus *Helix* is predominant, amounting to 37 species; also the sections *Sulcobasis*, *Cristigibba*, both new, and *Albersia*, are very

characteristic and nearly peculiar to New Guinea; as are the genera *Calycia* and *Perrieria*. The other genera and subgenera of land shells are about the same as in the Malayan Archipelago, but *Amphidromus* is entirely wanting. The distribution of each species in the different parts of New Guinea and in other countries is given, in special tables for each family. Ann. Mus. Genov. xix. 313 pp., 11 pls.

Several species of *Helix* from D'Entrecasteaux Island, off the south-east of New Guinea, including 4 new, by E. A. Smith, Ann. N. H. (5) xi. pp. 190–192.

Solomon Islands and *New Hebrides*. Several *Melaniidæ* and *Neritinæ* mentioned by J. Brazier, P. Linn. Soc. N. S. W. viii. pp. 294–296.

Central Australia. 3 species of *Physa*, 1 *Paludina*, 1 *Tryonia* [?], and 1 *Anodonta*, found in Cooper's Creek, not named, but figured. The Gastropods die when the water dries up, but each flood stocks the creek again by bringing down young ones; the *Anodonta* survives by burying itself in the mud, and is eaten by the natives. E. B. Sanger, Am. Nat. xvii. pp. 1184 & 1185.

New Zealand. Descriptions of 16 new land shells, including 2 new genera, by F. W. Hutton, Tr. N. Z. Inst. xv. pp. 134–140.

12. *North America.*

Port Clarence, N.W. extremity of America, Bering's Island, and Japan. Some new species collected during Nordenskiöld's expedition, described by C. A. Westerlund, Nachr. mal. Ges. 1883, pp. 48–59, 165, & 166.

South-Eastern Alaska. 16 species of land shells collected, most of them extending to California; Aur. Krause, SB. nat. Fr. 1883, pp. 35–37.

Canada. 14 species of *Unio* (1 new), 3 of *Margaritana*, and 10 of *Anodonta*, enumerated by F. R. Latchford, Ottawa Nat. Club, iii. pp. 48–57. Descriptive notes on shells found at Ottawa by H. B. Small & P. B. Symes, *l. c.* pp. 57–59. [Neither seen by Recorder.]

United States. W. G. Binney gives a supplement to vol. v. of his Terrestrial air-breathing Mollusks of the United States, published in 1878, containing all the additional information relating to the subject, with several new figures of shells and radulæ, and a new systematic list of all known species; Bull. Mus. C. Z. xi. No. 8, pp. 135–166, pls. i.–iv.

American localities of *Limax maximus* (L.); A. F. Gray, Am. Nat. xvii. p. 105, and J. H. Pillsbury, Science, ii. p. 278, and Am. Nat. xvii. p. 427.

Geographical distribution of the species of *Campeloma* (or *Melantho* of most authors) in North America; R. E. Call, Am. Nat. xvii. pp. 606 & 607.

Margaritana margaritifera (L.). Its geographical distribution in North America sketched by A. F. Gray, Am. Nat. xvii. pp. 324–326.

Ohio. The literature of its shells collected by Arthur Gray, Cincinn. Soc. vi. pp. 39–53.

Colorado Desert and farther east. R. Stearns gives some particulars concerning *Tryonia protea* and *Physa humerosa* found on the surface of

o Colorado Desert, at Indio, and *Anodonta californiensis* in the St. ..uz River, Arizona; Am. Nat. xvii. pp. 1014–1020, woodcuts.

Florida. 20 inoperculated and 4 operculated land shells, 1 *Planorbis* and 5 *Auriculidæ*, collected by H. Hemphill, enumerated by W. H. Dall, P. U. S. Nat. Mus. vi. pp. 321–323. No true fresh-water Bivalve; 2 species of *Cyrena* in saline ponds.

18. *West Indies and South America.*

Porto Rico. The land and fresh-water shells enumerated by J. Gundlach in An. Soc. Esp. xii. pp. 5–58. The species have been already given by the Recorder in JB. mal. Ges. iv. 1877, pp. 340–362, from the collections of J. Gundlach and L. Krug.

Guadeloupe, Les Saintes, Marie-Galante, and *Désirade.* List of their land and fresh-water shells, with valuable biological observations, by H. Mazé, J. de Conch. xxxi. pp. 1–54, pl. i. The first nourishes 80 species, of which only 18 are really fresh-water species, 10 submarine littoral, and 5 inhabitants of saline water. The species collected on the other islands are much fewer, but do not differ from those of Guadeloupe, except *Amphibulima patula*, found alive only on Marie-Galante, and *Rhodonyx rubescens* (Desh.), the occurrence of which on the same island is somewhat doubtful.

Trinidad. Notes on its fresh-water shells, including a species of *Mytilidæ* [probably *Praxis*] and a small *Pholas*; J. v. Kennel, Arb. z. Inst. Würzb. vi., separate copy, p. 6.

Eastern Brazil. 17 terrestrial and 7 fresh-water species enumerated, with valuable notes concerning their geographical distribution and synonymy; H. Dohrn, JB. mal. Ges. x. pp. 346–356, pl. xi.

b. Marine Mollusca.

1. *Deep Sea Researches Generally.*

R. Watson describes new species of *Nassaria, Murex, Scalaria, Solarium,* of *Fissurellidæ, Eulimidæ, Tornatellidæ,* and *Bullidæ*, from H.M.S. 'Challenger' Expedition, found at St. Thomas, the Azores, Ascension, in the South Atlantic, Kerguelen, Torres Straits, Amboyna, the Philippines, and Fiji; some of the *Fissurellidæ* found in the West Indies at 390 fath. are identical with European Miocene fossils: J. L. S. xvi. pp. 594–611, & xvii. pp. 26–40, 112–130, 284–293, & 319–346.

Western Africa, Coast of Sahara, Azores, and *Cape Verde Islands.* Some new species from depths of 400–5000 metres; P. Fischer, J. de Conch. xxxi. pp. 391–394.

On the deep-sea *Solenoconchæ*; id. C.R. xcvi. pp. 77–79.

Several Arctic species of *Mollusca*, found in great depths of the Atlantic between the tropics, discussed; *id. op. cit.* xcvii. pp. 1497–1499.

A blind species of *Fusus* found in the depths of the Sargasso Sea;

Alphonse Milne-Edwards, Bull. hebdomad. de l'Association scientifique de France, Dec. 1883.

J. Gwyn Jeffreys continues his paper on the shells procured during the 'Lightning' and 'Porcupine' Expeditions, 1868–70, in the Atlantic and Mediterranean, treating of the *Scissurellidæ*, *Trochidæ*, *Turbinidæ*, and *Littorinidæ*. There are several species now found alive in the depths, which had been previously only known as fossil from subapennine strata; P. Z. S. 1883, pp. 88–115, pls. xix. & xx.

2. *Arctic Seas.*

Northern Coast of Siberia. Preliminary account of the *Mollusca* observed during Nordenskiöld's Expedition along the northern coast of Asia, by A. Stuxberg in 'Vega'-Expeditionens Vetenskapeliga Iakttagelser, vol. i. 1882, pp. 695–715, 734, 736, 740, 741, & 793–800. There is no proper littoral fauna, but animal life begins no higher than at about 3 fath., the higher parts of the shore being too much under the changing influence of the ice; Novaya Zemlya makes a distinct limit in the geographical distribution of several species. 42 species of Bivalves, 1 new, and several new varieties, collected during the 'Vega' Expedition, are enumerated and described by W. Leche in the same work, vol. iii. pp. 433–453, pls. xxxii.–xxxiv.; the following are more generally distributed beneath the mouth of the Yenisei and Bering Strait:—*Cyrtodaria kurriana* (Dkr.), *Tellina lata* (Gm.), *Astarte semisulcata* var. *placenta* (Mörch), *A. warhami* (Hanc.), *Yoldia arctica* (Gray), *Arca glacialis* (Gray), and *Modiolaria lævigata* (Gray).

Some species from the same Expedition mentioned by J. Gwyn Jeffreys, with indication of the depths; Ann. N. H. (5) xii. p. 119.

Varanger Fjord. Abstract of the paper by G. Pouchet and J. de Guerne in Ann. N. H. (5) xi. p. 221.

3. *Seas of Northern Europe.*

Färoe Channel. J. Gwyn Jeffreys enumerates the shells dredged between the Hebrides and Färoes by J. Murray in H.M.S. 'Triton' in 1882; most species found in the "warm area" have an extensive range in the North Atlantic, those found in the "cold area" are mostly northern, some arctic; several new species are described and figured. P. Z. S. 1883, pp. 389–399, pl. xliv.

Belgian Coast. Some rather rare species of *Mollusca* mentioned by P. Pelseneer, Ann. Soc. mal. Belg. xvii. pp. 33–39.

Jersey. Interesting observations concerning the occurrence of rare species in the deeper part of the littoral zone, and list of 77 species found there; E. Duprey, Ann. N. H. (5) xi. pp. 185–189.

Brest. 153 marine Bivalves, 345 Gastropods, 2 Pteropods, and 8 Cephalopods enumerated, with several biological notes, by F. Daniel, J. de Conch. xxxi. pp. 224–263.

4. *Mediterranean.*

W. KOBELT commences an illustrated work on the European sea shells, beginning with the *Muricidæ* [title, *suprà*, p. 6].

BUCQUOY, DAUTZENBERG, & DOLLFUS continue their work on the marine *Mollusca* of Southern France, figuring on five photographic plates the *Pleurotomidæ*, 5 species of *Mitra*, 2 of *Cypræa*, and 3 of *Ovula*, the *Naticidæ* and *Pyramidellidæ*. For some new generic names, see *infrà*.

A. F. MARION gives very interesting particulars and lists of *Mollusca* in a general account of the topographical distribution of marine animals near Marseilles, and in a subsequent paper on the deep-sea fauna of the Mediterranean between Marseilles and Corsica; Ann. Mus. Marseille, i. Nos. 1 & 2.

21 Bivalves found at Carini, near Palermo, by A. de Gregorio, enumerated by MONTEROSATO, Nat. Sicil. iii. pp. 87–91.

Some marine shells from Gibraltar mentioned by KOBELT, J. of Conch. iv. p. 2.

Gulf of Gabes, Tunisia. 282 species collected by F. de Nerville, enumerated by P. DAUTZENBERG, J. de Conch. xxxi. pp. 289–330.

Adriatic. A. WIMMER enumerates 101 species of marine Gastropods and 64 Bivalves collected in Istria and Dalmatia, with indication of the depths in which they have been found; Verh. z.-b. Wien, xxxii. pp. 255–263.

Notes and exact descriptions of Mediterranean *Nudibranchia* observed at Trieste by R. BERGH, Verh. z.-b. Wien, xxxii. pp. 7–73, pls. i.–vi.

148 species dredged by Admiral Spratt, about thirty years ago, off Crete in from 70 to 120 fath., some new, determined and enumerated; J. GWYN JEFFREYS, Ann. N. H. (5) xi. pp. 393–401, pl. xvi.

5. *East Coast of North America.*

Labrador. 1 Cephalopod, 48 marine Gastropods, and 30 Bivalves dredged by the expedition under W. A. Stearns in 1882, and some others from Packard's collections, enumerated by KATHARINE BUSH, P. U. S. Nat. Mus. vi. pp. 236–247, pl. ix.

Florida. 110 marine Gastropods and 33 Bivalves collected by H. Hemphill and others, mostly identical with those of the West Indies, presenting "a curious mixture of tropical and temperate forms," some common to the West Coast, and quite a number which present marked similarity to species of the West Coast, several new, enumerated by W. H. DALL, P. U. S. Nat. Mus. vi. pp. 320 & 322–342, pl. x.

6. *Tropical Atlantic.*

T. STUDER states (in a paper on West African *Crustacea*) that 55 species of Gastropods out of 541 known from the West Coast of Africa are found also on the opposite coast of America; he thinks their distri-

bution is due to the currents, which bear the swimming larvæ from Guinea to Cape S. Roque: Abh. Ak. Berlin, 1882 [1883], p. 5.

Senegambia. Note on dredging and depths in the Bay of Gorée by H. v. MALTZAN: out of 36 species of *Pleurotomidæ* which were here found, 5-6 (about 15 per cent.) also live in the Mediterranean; but these are here generally of smaller size than in the Mediterranean, and also rather scarce, so that only 5 per cent. can be said to belong to the Mediterranean species: JB. mal. Ges. x. pp. 117, 134, & 135. New Senegambian species also described by ROCHEBRUNE, Bull. Soc. Philom. (7) vii. pp. 177–182 [the latter not seen by Recorder].

48 species of marine Gastropods and 12 of Bivalves from Landana, near the mouth of the Congo, several not determined, 3 new, enumerated by A. E. CRAVEN, Ann. Soc. mal. Belg. xvii. pp. 15–19.

7. *Indian Seas.*

Socotra. 36 marine shells from Socotra, 1 new (*Planaxis*), the others well known from the Oriental seas, collected by Riebeck and Schweinfurth, enumerated by E. v. MARTENS, Conchol. Mitth. ii. pp. 151 & 152.

Andaman Islands. 20 new species of small Gastropods, chiefly *Pyramidellidæ* and *Pleurotomidæ*, described by L. DE FOLIN, Moll. Andaman, i. pp. 3–19. (The author cites plates, which are not present in the copy received by the Recorder.)

Salanga Island, Coast of Malacca. About 100 marine species collected by M. Weber, enumerated by E. v. MARTENS, Conchol. Mitth. ii. pp. 137 & 138.

Some general observations concerning the occurrence of *Nudibranchia* in the Eastern seas, and their apparent absence at certain seasons, and descriptions of 18 new species, by C. COLLINGWOOD, Tr. L. S. (2) ii. [1881] pp. 123–140, pls. ix. & x.

8. *Northern Pacific.*

Japan. Some notes on shells found at Enosima; some are imported from the coral reefs of the Bonin Islands, and have been wrongly regarded as Japanese; L. DÖDERLEIN, Arch. f. Nat. xlix. pp. 103, 107, & 111.

9. *Australian Seas.*

J. BRAZIER gives the synonymy and localities of several marine Australian shells; P. Linn. Soc. N. S. W. viii. pp. 224–234.

The new New Zealand *Mollusca* collected during the expedition of the 'Challenger' are extracted by R. B. WATSON from his publications in J. L. S. from 1879 to 1883, in N. Z. J. Sci. i. pp. 319–321, 353–359, & 441–443.

Some new species from New Zealand described by F. W. HUTTON, Tr. N. Z. Inst. xv. pp. 131–133.

A paper by J. E. TENISON-WOODS on some new marine *Mollusca* of Australia, in Tr. R. Soc. Vict. xvii. [1881] pp. 80–83, has been omitted from the two preceding Records.

Palæontology of Recent Mollusca.

Recent terrestrial and fresh-water species in some præglacial strata of Northern Germany observed by K. Keilhack, JB. geol. Landes-anstalt, 1882, pp. 139, 169, & 170.

16 fresh-water and 10 terrestrial species found in alluvial tufa near the Netze River, in Posen, enumerated by E. Friedel, Nachr. mal. Ges. 1883, p. 187, all recent species.

J. Bakowsky has made some observations on the land shells found in the löss of Galicia in his book, "Glina Dyluwialna we lwowie i ney b lizszej okolicy" (Lemberg : 1881). They are the same species as in Germany.

84 Post-pliocene species from Lombardy enumerated, and the land shells found in a Post-pliocene bed near Stradella discussed ; all belong to existing species: N. Pini, Atti Soc. Ital. xxvi.

Ætheria caillaudi, Corbicula fluminalis, Cleopatra bulimoides, and the Abyssinian *Unio dembeæ*, found in probably prehistoric deposits of the Nile by G. Schweinfurth, and determined by E. v. Martens, SB. nat. Fr. 1883, pp. 4–6.

Löss of China. V. Hilber gives a list of 18 species of land shells found in it by v. Loczy and others; 10 of them are still living species, 2 of which are also very common in the European löss, viz., *Pupa muscorum* and *Succinea oblonga* ; the genera *Buliminus* and *Clausilia* are entirely wanting in it, although well represented in the recent fauna of China ; but some species of *Helix* which live on stones and rocks are found, for example, *Helix pyrrhozona* (Phil.). SB. Ak. Wien, lxxxvi. Abth. 1, pp. 313 & 325–348, & lxxxviii. Abth. 1, pp. 1386–1389.

A palæontological work may be mentioned here exceptionally, viz., C. A. White's "Review of the Non-marine Fossil *Mollusca* of North America," in Rep. U. S. Geol. Surv. (Washington: 1883, large 8vo, 144 pp., 32 pls.). The greater part of this work is devoted to Mollusks of the Laramie group, between Cretaceous and Tertiary, but the accounts and conclusions concerning the then existing systems of rivers and lakes have an undeniable importance for understanding the geographical distribution of existing fresh-water shells. In this regard, the author suggests that some tributaries of the present Mississippi system are identical, at least in part, with outlets and inlets of the great western Laramie and Tertiary lakes, and that what were once separate rivers or minor drainage systems, discharging into a northern section of the Mexican Gulf, became afterwards united in a common channel during the progressive elevation of the continent. This gradual coalescence of the rivers allowed forms originally peculiar to circumscribed regions to extend over a large area.

List of subfossil marine shells found at the Yenisei, and the bathymetrical distribution of the same species in Novaya Zemlya and Norway, by A. Stuxberg, in 'Vega' Expeditionens Vetenskapliga Iakttagelser, i. pp. 804–810.

On some Post-pliocene Bivalves from Palermo ; A. de Gregorio, Nat. Sicil. iii. pp. 78–80.

Historical Changes and Acclimatation.

Lithoglyphus naticoides (Fér.) found in the summer of 1883 near Küstrin by Heinrich Schulze, near Berlin by Oswald Schulze, and near Danzig by E. Schumann; also a dead specimen near Thorn in 1882 by E. Friedel. As there is no probability that this very peculiar shell should have been overlooked by former authors, it seems a second example of contemporaneous immigration from the south-east, similar to that of *Dreissena polymorpha*. Martens, SB. nat. Fr. 1883, pp. 100–102, and Friedel, Nachr. mal. Ges. 1883, pp. 183–186.

F. T. Köppen points out how far *Dreissena polymorpha* (Pall.) was distributed in Europe in Pliocene and Plistocene times, and how it has regained in the present century a more general distribution throughout a large part of Europe; he has collected for this purpose a considerable amount of information additional to that given by the Recorder in Zool. Gart. 1865, and thinks that the original habitat of this species is the Caspian Sea, from whence it migrated northward and westward by the Volga and its Oka confluent: title, *suprà*, p. 7. The same alluded to by Nehring, SB. nat. Fr. 1883, pp. 68 & 69. This species now also found at Basel; Sterki, Nachr. mal. Ges. 1883, p. 74.

Helix pomatia. Some traditions concerning its introduction into England mentioned by W. C. Atkinson, Nature, xxviii. p. 81.

Helix acuta (Müll.) and *candicans* (Ziegl.), imported at Frankfort, became extinct within two years; Kobelt, JB. mal. Ges. x. p. 99. The former (*Bulimus acutus*) found in a garden at Collingwood, New South Wales, introduced from France; Abstract of P. Linn. Soc. N. S. W. July, 1883, p. iii.

Alterations in the Molluscan fauna of a small pond, in which 5 species of fresh-water shells were found in 1884, though not in 1860–63; W. Nelson, J. of Conch. iv. p. 117.

Decrease of *Physa guadeloupensis* (Fischer) in number and size of late years; Mazé, J. de Conch. xxxi. p. 31.

Bithynia tentaculata (L.) found recently at Burlington, Vermont, and very abundant in the Mohawk, where it was planted by J. Lewis; A. F. Gray, Am. Nat. xvii. p. 205.

Margaritana margaritifera (L.) found in Anticosti in 1881, but not in 1861, by Prof. Hyatt; Nachr. mal. Ges. 1883, p. 93.

Unio pressus (Lea), originally described from the Ohio, has recently been found in the States of New York and Vermont and in Canada; probably it extends its area first by the agency of water-fowl, and then by following the currents of the rivers and the shores of the lakes: A. F. Gray, Am. Nat. xvii. p. 205, and W. M. Beauchamp, *l. c.* p. 434.

Immigration of littoral shells by the Suez channel, *Cardium edule* in the Timsah Lakes, *Mactra olorina* and *Mytilus variabilis*, from the Red Sea, in Lake Menzaleh, &c.: C. Keller, Denk. schw. Ges. xxviii. pt. 2, 1882, pp. 23–26; abstract in Nachr. mal. Ges. 1883, p. 117.

. Gwyn Jeffreys gives some notes concerning the acclimatation of ·ible Mollusks; Nature, xxvii. p. 510.

, *Litorina litorea* found on Long Island; Prime, Am. Nat. xvi. 1882, 737.

Venus mercenaria (L.) acclimatized at the mouth of the Dee; Marrat, Nachr. mal. Ges. 1883, p. 116.

Acclimatation of *Ostrea angulata* (Lam., as *Gryphæa*) on the south-western coast of France; J. Brock, Biol. Centralbl. iii. pp. 291 & 292.

K. Möbius gives an account of attempts to plant oysters from the mouth of the Lawrence River, where the water is less salted, in the Baltic, in the years 1880–82; the oysters lived and increased in size, but apparently did not multiply: Circular des deutschen Fischerei Vereins, 1883, No. 2, pp. 68–71; transl. in Bull. U. S. Fish. Comm. iii. pp. 213–217.

R. Stearns gives an account of an unsuccessful experiment to bring some large edible Bivalves of the west coast, *Schizothærus nuttalli* (Conrad), *Saxidomus nuttalli* (Conrad), and *Glycymeris generosa* (Gould), alive to the east coast of North America; Bull. U. S. Fish. Comm. iii. pp. 353–362.

Use by Man.

A. T. de Rochebrune has commenced a separate treatise on the employment of *Mollusca* by ancient and modern peoples [title, *suprà*]; the first part treats of the Americans.

F. Winslow gives, in his "Catalogue of Economic *Mollusca*," an enumeration of all the species of North America which are of practical use for man, and some interesting data concerning the pecuniary value which they represent; this amounts to about 14,000,000 dollars (13,000,000 of which belong to oysters alone).

A few critical notes on the *Mollusca* in the International Fisheries Exhibition at London, especially oysters and *Buccinidæ*, by J. Gwyn Jeffreys, Ann. N. H. (5) xii. pp. 16–20.

E. Ingersoll publishes valuable historical notes concerning 'wampum,' pieces of *Venus mercenaria* (L.) and 2 species of *Fulgur*; its manufacture and commercial use during former centuries in North America: Am. Nat. xvii. pp. 467–479; abstract in Nachr. mal. Ges. 1883, pp. 87–89.

Particulars of cameo-cutting from the shells of *Cassis*, taken from Simmonds's "Commercial Products of the Sea," in Tryon's "Structural and Systematic Conchology," ii. pp. 200 & 201.

W. H. Dall publishes a lecture on pearls and pearl-fisheries, which contains many very interesting historical, geographical, and technical particulars, in Am. Nat. xvii. pp. 579–587 & 731–745.

Note on the pearl-fishery at the Bahrein Islands in the Persian Gulf, by E. Schlagintweit in "Österreichische Monatsschrift für den Orient," ix. p. 98; abstract in Nachr. mal. Ges. 1883, pp. 153–156.

Notes on pearls and pearl-fishing in the Gulf of California, by J. Sanchez, in Nat. Mex. v. [1880] pp. 10–13; see also Dall, Science, 1883, No. 13, and Kobelt, Nachr. mal. Ges. 1883, pp. 60 & 116.

Statistical note on the export of *Haliotis*-shell and pearl oysters from the Pacific Coast of North America, by DALL, Bull. U. S. Fish Comm. iii. 1883, p. 425, and Science, 1883, p. 81; abstract in Nachr. mal. Ges. 1883, p. 116.

Species of *Unio* and *Anodonta* employed as food in Ottawa; Nachr. mal. Ges. 1883, p. 117.

On the edible oysters of New Zealand; COX, P. Linn. Soc. N. S. W. vii. pp. 555–560.

Notes on Japanese shell-mounds, by D. BRAUNS, in CB. Ges. Anthrop., Feb. 1883, and Nachr. mal. Ges. 1883, pp. 67–71.

Teredo. Cement as preservative against its ravages; Horton, Nachr. mal. Ges. 1883, p. 61.

Collecting.

B. B. WOODWARD, "The Young Collector's Handbook of Shells," London, small 8vo, may be mentioned here; *cf.* Ann. N. H. (5) xii. p. 65.

A. G. WETHERBY publishes directions for collecting and preparing land and fresh-water shells in J. Cincinn. Soc. v. pp. 44–51.

Improved stick or umbrella for collecting shells, described by CLESSIN, Mal. Bl. (2) vi. p. 204.

CEPHALOPODA.

The chromatophores of the *Cephalopoda* have no distinct enveloping membrane or radiating muscles, but are simply amœboid cells, like those of Fishes, *Batrachia*, and the Chamæleon, very active, and under the influence of the nervous system; R. BLANCHARD, C.R. xcvi. pp. 655–658; abstract in Ann. N. H. (5) xi. p. 292, and in Bull. Soc. Zool. vii. pp. 492–496. The development of the chromatophores from simple cells observed in *Sepiola*, and described by P. GIROD, Arch. Z. expér. (2) i. pp. 225–266, pl. xiv.; preliminary abstract in C.R. xcvi. pp. 1375–1377; abstract in J. R. Micr. Soc. (2) iii. pp. 494 & 495, and Le Nat. No. 41, p. 322.

The structure of the cups in the arms of the Cephalopods examined by P. GIROD, C.R. xcvii. pp. 195–197 & 338–340.

The development of the gills in the Cephalopods is the subject of a paper by L. JOULIN, *tom. cit.* pp. 1076–1078.

Octopus maculosus, sp. n., Hoyle, P. Phys. Soc. Edinb. vii. pp. 319–322, pl. vi., Australia.

Cirroteuthis umbellata, sp. n., P. Fischer, J. de Conch. xxxi. pp. 402–404, West coast of Africa, 1139–2235 metres.

Ommatostrephes sagittatus (Lam.) found alive at Eastbourne; F. C. S. Roper, Ann. N. H. (5) xi. p. 288.

[*Megateuthis.*] Note on giant Cephalopods in Japan by Mohnicke in his work, "Blicke auf das Pflanzen- und Thierleben in den niederländischen Malayenländern," Münster, 1883; also Nachr. mal. Ges. 1883, p. 188.

Nautilus. A. G. Bourne describes the differences between the males and females; he suggests that the tentacular lobes are analogous to the arms of the *Dibranchiata*, and the tentacles probably to the suckers, and distinguishes eight of such lobes, viz., four internal, two superior, and two inferior. In the males, four tentacles of the left superior lobe become hectocotylised; the corresponding four on the right side are also slightly modified in the same sense. P. Brit. Ass. 1883, and Nature, xxix. p. 580; abstract in J. R. Micr. Soc. (2) iii. p. 830.

Mention may be made here of A. Hyatt's paper on the genera of fossil Cephalopods, P. Bost. Soc. xxii. pp. 253–338, containing a large number of new generic names, such as "*Koninckioceras*," "*Sandbergenoceras*," &c.

HETEROPODA.

The sucker on the fin is also in the genera *Pterotrachea* and *Firoloides* not confined to the male sex; W. Fewkes, Am. Nat. xvii. p. 206.

Sinusigera. A. Craven, who, in Ann. Mal. Belg. xii. 1877, declared this to be a full-grown shell, against the general opinion, now concedes that it represents the young state of some Pectinibranch, such as *Purpura* or *Pisania*; *Sinusigera perversa* (Craven) is the young of a *Triforis*: Ann. N. H. (5) xi. pp. 141 & 142, woodcut, and P.-v. Soc. mal. Belg. xii. p. xxvi.

GASTROPODA.

F. W. Hutton continues to describe and figure the radula of New Zealand Branchiate Gastropods; Tr. N. Z. Inst. xv. pp. 118–131, pls. xiii.–xvi. 59 species.

PECTINIBRANCHIA.

Muricidæ.

Murex. J. Poirier publishes a revision of this genus, chiefly from the material in the Paris Museum. He discusses its geographical distribution, giving lists of the species found in the different seas, distinguishes 9 subgenera, already named, and enumerates 294 species, with their synonymy; of all those which exist in the Paris Museum, the localities are registered. The following are new or not before figured:—*M.* (*Tribulus*) *carbonnieri* (Jousseaume, 1881), p. 31, pl. iv. fig. 1, Red Sea; *M.* (*Chicoreus*) *bourguignati*, sp. n., p. 48, pl. v. fig. 2, Nossi-Bé; *poirieri* (Jousseaume, 1881), p. 55, pl. iv. fig. 2, New Caledonia; *rochebruni*, sp. n., p. 57, pl. v. fig. 4, Diego Suares; *jousseaumi*, sp. n., p. 58, pl. vi. fig. 1, New Caledonia; *M.* (*Phyllonotus*) *hirsutus*, sp. n., p. 83, pl. vi. fig. 2, locality unknown; *M.* (*Homalocantha*) *lamberti*, sp. n., p. 86, pl. vi. fig. 3, New Caledonia; *M.* (*Muricidea*) *caledonicus* (Jousseaume, 1880), p. 110, pl. v. fig. 3, New Caledonia; *M.* (*Ocinebra*) *erinaceoides* (Valenc., 1883), p. 115, pl. iv. fig. 3, Acapulco. *M. australis* (Quoy & Gaimard), from

original specimens, = *palmiferus* (Sow.), p. 65. N. Arch. Mus. (2) v[illegible]ra pp. 13–128, pls. iv.–vi.

Murex gundlachi, Cuba, and *serrato-spinosus*, Flores, spp. nn., Dunker, Mal. Bl. (2) vi. p. 34, pl. i. figs. 1–5.

Murex octogonus (Q. G.) and *Trophon paiva* (Crosse). Operculum and dentition; Hutton, Tr. N. Z. Inst. xv. pp. 118 & 119, pl. xiii. figs. *c* & *d*.

Murex acanthostephes, *acanthodes*, and *pholidotus*, Cape York, *cordismei*, Bass's Straits, *dentifer*, lat. 4° S., long. 129° E., 200–360 fath., *pyrrhias*, Azores, 450–500 fath., and *pauper*, Amboyna, spp. nn., Watson, J. L. S. xvi. pp. 596–604.

Murex brandaris, *trunculus*, *erinaceus* (L.), and *gibbosus* (Lam.), described and figured in Kobelt's Iconographie d. europ. Meeresconchylien, pt. 1, pp. 1–14, pls. i.–iv.

Murex erinaceus (L.). A variety found in the recent state at Felixstow beach corresponds exactly with the *Purpura tetragona* (S. Wood) of the Crag; S. V. Wood, Ann. N. H. (5) xii. p. 66. Jeffreys opposes this identification; *tom. cit.* p. 143. S. V. Wood maintains it, stating that in 61 of 113 recent specimens the canal is wholly open, in 52 more or less covered; *l. c.* p. 208.

Typhis phillipensis, sp. n., Watson, J. L. S. xvi. p. 605, Port Phillip, Melbourne.

Trophon carinatus, sp. n., Jeffreys, P. Z. S. 1883, p. 395, pl. xliv. fig. 4, Färoe Channel, warm area.

Purpuridæ.

Purpura haustrum (Martyn), *textiliosa* (Lam.), *Polytropa quoyi* (Reeve), *striata* (Martyn), *scobina* (Q. G.), and *albo-marginata* (Desh.). Operculum and dentition; Hutton, Tr. N. Z. Inst. xv. pp. 120 & 121, pl. xiii. figs. *o–t*.

Purpura baileyana, sp. n., Tenison-Woods, Tr. R. Soc. Vict. xvii. [1881] p. 80, Australia.

Polytropa cheesemani, sp. n., Hutton, *l. c.* p. 131, New Zealand.

Latiaxis sallei, sp. n., Jousseaume, Bull. Soc. Zool. 1883, p. 186, pl. x. fig. 3, Japan.

Lataxiena, g. n. near *Latiaxis*; no distinct character given. It comprises *Murex luculentus* (Reeve), *Latiaxis rhodostoma* (A. Ad.), *Fusus blosvillii* (Desh.), *L. lataxiena*, sp. n., Japan, and *elegans*, sp. n., locality unknown. Jousseaume, Bull. Soc. Zool. viii. pp. 188–190 (*L. lataxiena*, pl. x. fig. 1).

Buccinidæ.

Neptunea dilatata (Q. G.) and *nodosa* (Martyn), *Euthria lineata* (Chemn.) and *vittata* (Q. G.), *Cominella virgata* (Ad.), *maculata*, and *testudinea* (Martyn). Operculum and dentition, that of the first different from Troschel's description; Hutton, Tr. N. Z. Inst. xv. pp. 119 & 120, pl. xiii. figs. *f–n*.

[*Siphonalia*] *Fusus sabini* (Gray) = *tortuosus* (Reeve), *F. delicatus*, *hirsutus*, and *concinnus*, spp. nn., Jeffreys, P. Z. S. 1883, pp. 395–497, pl. xliv. figs. 5–8, Färoe Channel, cold area.

Sipho lividus (Mörch), Labrador and Canada; K. Bush, P. U. S. Nat. Ms. vi. p. 238, pl. ix. fig. 12.

Fusus abyssorum, sp. n., P. Fischer, J. de Conch. xxxi. p. 391, Western coast of Africa, in depths of 2285 and 5005 metres.

Buccinum. W. Kobelt finishes his monograph of this genus by an appendix, discussing and figuring 23 species, originals or drawings of which he has received from Dr. Herzenstein, in St. Petersburg (from the collection made by T. von Middendorff), W. Dall, E. A. Smith, and T. A. Verkrüzen; but he himself doubts the specific value of most of them. The following have not before been figured:—*B. herzensteini* (Verkr.), Awatcha, *middendorffi* (Verkr.), Sachalin, *simplex* (Midd.), *pulcherrimum* (Verkr.), Russian Lapland, *tenebrosum* (Midd., *nec* Hancock), Russian Lapland, *verkruezeni*, new name for *schantaricum* (Verkr., *nec* Midd.), Sachalin, *schrenki* (Verkr.) = *ochotense* var., *grebnitzki* (Verkr.) = *totteni* (Rv.), *angulosum* (Gray), distinct from *glaciale* (L.), Novaya Zemlya, *packardi* (Stimps.), *plectrum* (Stimps.), N. of Bering Strait, *castaneum* (Dall), Shumagin Islands, *polare* (Gray ?) and its var. *percrassa* (Dall), N. of Bering Strait, *fischerianum* (Dall, MS.), St. Paul's Island, Alaska, *tenellum* (Dall, MS. ?), Nuniwak, *fringillum* (Dall), Icy Cape, *stimpsoni* (Gould), Bering Strait, *japonicum* (A. Ad.), Okosiri, *jeffreysi* and *mirandum* (E. A. Smith), Japan. Küster's Conch. Cab. pt. 325, pp. 74–93, pls. lxxxix.–xcii.

Buccinum totteni (Stimps.) and *ciliatum* (Fabr.), Labrador and Canada, Bush, P. U. S. Nat. Mus. vi. p. 239, pl. ix. figs. 13 & 14.

Buccinum schantaricum (Midd., *nec* Schrenck), *kobelti*, sp. n., figured by Kobelt in the new edition of Chemnitz, *Bucc.*, pl. lxxvi. fig. 1, Bering Sea, and *convexum*, sp. n., Newfoundland, Verkrüzen, Nachr. mal. Ges. 1883, pp. 144–150.

Buccinopsis dalii (Sow.) with var. *eburnea* (Sars), *B. nux* and *canaliculata* (Dall), Kobelt, in Küster's Conch. Cab. pt. 325, *Buccinum*, pp. 99–103, pl. lxxxviii. figs. 2–4 & 10–12.

Neobuccinum eatoni (E. A. Smith); *id. l. c.* p. 104, pl. lxxxviii. fig. 4.

Chlanidota vestita (Martens); *id. l. c.* p. 106, pl. lxxxviii. figs. 7 & 8.

Volutharpa. 3 known species described, and 2 more mentioned; *id. l. c.* pp. 94–98, pl. xciii. figs. 5–11.

Oocorys, g. n. "Testa imperforata, ovato-globosa, spiraliter sulcata; spira mediocris; anfr. ultimus magnus, ventrosus; apertura ovata; labrum extus varicosum, intus simplex, haud sulcatum; columella arcuata, concava, contorta, oblique truncata; callum columellare tenue, repandum; canalis brvissimus, obliquus. Operculum corneum, spirale." *O. sulcata*, sp. n., 36mm. long, West coast of Africa, in depths of 1258–3655 metres. P. Fischer, J. de Conch. xxxi. p. 392.

Eburna immaculata, sp. n., Jousseaume, Bull. Soc. Zool. 1883, p. 192, pl. x. fig. 1, locality unknown.

Phos intricatus, sp. n., W. H. Dall, P. U. S. Nat. Mus. vi. p. 325, pl. x. fig. 9, Florida.

Nassaria kampyla, sp. n., Watson, J. L. S. xvi. p. 594, operculum figured in woodcut, off Sydney, 410 fath.

Nassidæ.

Nassa weyersi, sp. n., Craven, Ann. Soc. mal. Belg. xvii. p. 16, pl. ii. fig. 2, Landana, mouth of the Congo.

Bullia fusca, sp. n., *id. l. c.* p. 16, pl. ii. fig. 1, Landana.

Olividæ.

W. Tryon subdivides this family into the subfamilies *Olivinæ*, *Ancillarianæ*, and *Harpinæ*; the first comprising *Olivella*, *Oliva*, and the Tertiary *Plochelæa* (Gabb); the second, *Ancillaria* and the Eocene *Monoptygma*; the third, *Harpa* alone: Manual of Conchology, v. pp. 59–61.

Oliva. Tryon describes and figures 54 species, with many varieties, distributing them in the following subgenera:—*Oliva* proper, *Lamprodoma*, *Callianax*, *Agaronia*, and *Olivancillaria*. L. c. pp. 78–91, pls. xviii.–xxxvi.

Olivella (Swains.). 30 species described and figured; *id. l. c.* pp. 3–72, pls. xiv.–xvii.

Ancillaria. 19 species described and figured, including as subgenera *Anolacia* (Gray) and *Dipsaccus* (Klein); *id. l. c.* pp. 92–97, pls. xxxvii.–xxxix.

Ancillaria australis (Sow.). Dentition; Hutton, Tr. N. Z. Inst. xv. p. 121, pl. xiii. fig. *c*.

Taron, g. n. Central tooth small, rectangular, three-cusped, lateral teeth broad, curved, with seven cusps; operculum ovate, subconcentric. *Trophon dubius* (Hutton), New Zealand. *Id. l. c.* p. 119, pl. xiii. fig. *e*.

Harpa. 9 species described and figured; *id. l. c.* pp. 97–99, pls. xl. & xli.

Fusidæ.

Pusionella. [See *Pleurotomidæ*.]

Fusus. [See also *Buccinidæ*.]

Mitridæ.

Tryon continues to treat of the *Mitridæ* in the 4th volume of his Manual of Conchology, pp. 128–200, pls. xxxi.–lviii., bringing up the number of described and figured species of the genus *Mitra* to [illegible], 12; *Mitroidea*, including *Mauritia* and *Mutyca*, 5; *Dibaphus*, 1 [illegible], including *Pusia*, 145; *Cylindra*, 8; and *Imbricaria*, 9 species.

Mitra (*Mitromorpha*) *floridana*, sp. n., Dall, P. U. S. Nat. Mus. vi. p. 327, pl. x. fig. 12, Florida.

Mitrolumma, g. n. Type, *Mitra olivoides* (Cantr.), = *columbellaria* (Scacchi); Bucquoy, Dautzenberg, & Dollfus, Moll. mar. du Roussillon fasc. iii. p. 121, pl. xv. figs. 33–39.

Columbellidæ.

Tryon comprises in this family the genera *Columbella*, with many subgenera, also *Alcira* (H. Ad.), *Engina* (Gray), *Columbellina* (Orb.), *Amphissa* (Ad.), and the only fossil *Columbellaria* (Rolle); Manual of Conchology, v. pp. 100–103.

Columbella. 176 species, distributed in the subgenera *Columbella* (restr.), *Nitidella*, *Alia*, *Mitrella*, *Atilia*, *Anachis*, *Seminella*, *Mitropsis*, *Conidea*, *Meta*, and *Strombina*, described and figured; *id. l. c.* pp. 103–187, pls. xlii.–lx.

Columbella tayloriana (Reeve) = *albo-maculata* (Angas), New South Wales; Brazier, P. Linn. Soc. N. S. W. viii. p. 228.

Anachis ostreicola (Melvill) from Florida; Dall, P. U. S. Nat. Mus. vi. p. 326.

Astyris rosacea (Gould) var. from Labrador; K. Bush, P. U. S. Nat. Mus. vi. p. 241, pl. ix. fig. 6.

Alcira elegans (H. Adams); Tryon, Manual of Conchology, v. p. 188, pl. lxi. fig. 3.

Columbellina (Orb.). To this genus, founded on a fossil species, Tryon refers also *C. harpiformis* (Sow.), *uncinata* (Sow.), and *cithara* (Reeve); *l. c.* pp. 196 & 197, pl. lxiii. figs. 63–65.

Amphissa (H. & A. Adams). 2 species; *id. l. c.* p. 197, pl. lxiii. figs. 66 & 67.

Engina (Gray). Monograph; *id. l. c.* pp. 188–196 (37 species figured on pls. lxi.–lxxiii.).

Marginellidæ.

Marginella. Tryon, *l. c.* pp. 12–58, pls. v.–xiii., describes and figures 190 species, distributing them into the following groups:—Typical *Marginella*, *Glabella*, *Prunum*, *Cryptospira*, *Volutella*, *Persicula*, *Gibberula*, *Closia*, and *Volvaria*.

Marginella impudica, sp. n., P. Fischer, J. de Conch. xxxi. p. 392, West coast of Sahara, 800–1139 metres.

Erato. 18 species described and figured by Tryon, *l. c.* pp. 7–11, pl. iv.; *E. scabriuscula* (Gray), *sulcifera* (Gray), *corrugata* (Hinds), *nana* (Duclos), and *schmeltziana* (Dkr.), are placed by him in the subgenus *Eratopsis* (Hörnes), founded originally for fossil species.

Conidæ.

Conus nodulosus (Sow.) from West Australia; Cox, Abstract of P. Linn. Soc. N. S. W., Oct. 1883, p. iii.

Pleurotomidæ.

A number of known species from the Mediterranean photographically figured by Bucquoy, Dautzenberg, & Dollfus, Moll mar. du Roussillon, fasc. iii. pls. xiv. & xv.

Pleurotoma insignis, sp. n., Jeffreys, Ann. N. H. (5) xii. p. 120, Siberian Sea, 55 fath., about 3 inches long.

Pleurotoma exigua, sp. n., *id.* P. Z. S. 1883, p. 398, pl. xliv. fig. 10, Färoe Channel, warm area.

Pleurotoma microcerata, *bidentata*, *obesa*, *cincta*, and *gracilis*, spp. nn., Folin, Moll. Andaman, pp. 15–19, Andaman Islands.

Drillia thea, *leucocyma*, and *limonitella*, spp. nn., Dall, P. U. S. Nat. Mus. vi. pp. 328 & 329, pl. x. figs. 5, 8, & 10, Florida.

Drillia tripter and *ballista*, spp. nn., Maltzan, JB. mal. Ges. x. p. 120, pl. iii., figs. 1 & 2, Gorée.

Crassispira callosa (Kien.), *consociata* (E. A. Smith), *umbilicata* (Gray), and *lævisulcata*, sp. n.; *id. l. c.* pp. 120–122, pl. iii. figs. 3–6, Gorée.

Clavatula (Lam.). Note on its generic characters; *C. pluteata* (Rv.) var., *rubrifasciata* (Rv.) = *turris-virginea* (Chemnitz, *nec* Kien., *nec* Reeve), with var. n. *ferruginea*, *C. colini*, sp. n., *sacerdos* (Rv.), all from Gorée, and *martensi*, new name for *cærulea* (Martens, *nec* Weinkauff); *id. l. c.* pp. 122–128, pl. iii. figs. 7–10.

Defrancia formosa, sp. n., Jeffreys, P. Z. S. 1883, p. 397, pl. xliv. fig. 9, Färoe Channel, warm area, and N. Atlantic.

Mangilia companyoi, sp. n., Bucquoy, Dautzenberg, & Dollfus, Moll. mar. du Roussillon, fasc. iii. p. 108, pl. xv. figs. 20–22, Southern France.

Mangilia goreensis, *subclathrata*, *strucki*, and *senegalensis*, spp. nn., and *nebula* (Mont.) var. n. *medio-fasciata*, all from Gorée; Maltzan, JB. mal. Ges. x. pp. 131–134, pl. iii. figs. 11–15.

Mangilia anna, sp. n., Jousseaume, Le Nat. 1883, p. 325, New Caledonia.

Mangiliella, subg. n. of *Mangilia*. Type, *M. multilineolata* (Desh.); Bucquoy, Dautzenberg, & Dollfus, Moll. mar. du Roussillon, fasc. iii. p. 108, pl. xv. fig. 23–25.

Bellardia, subg. n. of *Pleurotoma*. Type, *P. gracilis* (Mont.); *iid. l. c.* p. 88, pl. xiv. figs. 1 & 2 [preoccupied in *Diptera*.—REC.]

Teres, subg. n. of *Pleurotoma*. Type, *P. anceps* (Eichwald); *iid. l. c.* p. 86, woodcut.

Cithara. Note on the animal by F. Jousseaume, Bull. Soc. Zool. viii. pp. 205–208.

Bela sarsi (Verrill) = *cancellata* (G. O. Sars, *nec* Mighels), Labrador, *incisula* (Verrill), Maine; K. Bush, P. U. S. Nat. Mus. vi. pp. 237 & 238, pl. ix. figs. 8 & 10.

Hydropleura, g. n. (Monterosato, MS.). Type, *Pleurotoma septangularis* (Mont.); Bucquoy, Dautzenberg, & Dollfuss, *l. c.* p. 110, pl. xiv. figs. 26 & 27.

Donovania, new name for *Lachesis* and *Nesæa* (Risso, 1826), both preoccupied; *iid. l. c.* p. 112. *D. minima* (Mont.), incl. *mammillata* (Risso), pl. xv. figs. 26–32.

Pusionella (Gray) belongs to the *Toxoglossa*, according to an examination of the radula by G. Schacko; 5 species from Gorée enumerated. *P. vulpina* (Born) and its more slender variety *buccinata* (Lam.) vary in colour; *P. recluziana* (Petit) is a white variety of the former. Maltzan, JB. mal. Ges. x. pp. 116, 129, & 130.

Cancellariidæ.

Cancellaria undulata (Sow.) = *granosa* (Angas), New South Wales; Brazier, P. Linn. Soc. N. S. W. viii. p. 226.

Cassididæ.

Cassis kalosmodix, sp. n., Melvill, J. of Conch. iv. p. 43, pl. i. fig. 1, locality unknown. Near *vibex* (L.).

Tritonium bayani, sp. n., Jousseaume, Bull. Soc. Zool. 1883, p. 191, pl. x. fig. 5, locality unknown.

Cypræidæ.

Cypræa lynx (L.). Variety from Australia; Cox, Abstract of P. Linn. Soc. N. S. W., Oct., p. iv.

Naticidæ.

Natica. 144 species described and figured by Sowerby, Thes. Conch. pt. 40, pp. 75–104, pls. ccccliv.–ccccxii. The following appear to have not been figured before:—*N. fusca* (Carp.), p. 89, pl. ccccxi., fig. 104, Mazatlan, *ustulata*, sp. n., p. 88, pl. ccccxi. fig. 112, locality unknown, *rubro-maculata* (E. Smith), p. 93, pl. ccccxi. fig. 124, locality unknown, *puerilis* (Gould), p. 92, pl. ccccxi. fig. 152, locality unknown, *mozaica*, sp. n., p. 92, pl. ccccxii. figs. 133 & 134, locality unknown, *papyracea*, sp. n., p. 79, pl. ccccxii. fig. 149, locality unknown, *gracilis*, sp. n., p. 92, pl. ccccxii. fig. 156, locality unknown, *abbreviata*, sp. n., p. 91, pl. ccccxii. figs. 157 & 158, Mediterranean, *clavata*, sp. n., p. 77, pl. ccccxii. fig. 167, Mauritius, *notata*, sp. n., p. 83, pl. ccccxii. fig. 168, New Caledonia.

Natica incii (Phil.) = *baconi* and *fibula* (Reeve), New South Wales and South Australia; Brazier, P. Linn. Soc. N. S. W. viii. p. 225.

Payraudeautia, subg. n. of *Natica*. Operculum horny, three umbilical furrows. Type, *N. intricata* (Donov.); Bucquoy, Dautzenberg, & Dollfus, Moll. mar. du Roussillon, fasc. iv.

Sigaretus. H. C. Weinkauff gives a monograph of this genus, including *Naticina*, describing and figuring 14 species, all before known and figured, and correcting their synonymy; *S. philippii*, new name for the species of the Mediterranean Sea, = *haliotideus* of Philippi, not of other authors. Küster's Conch. Cab. pt. 321A, pp. 1–24, pls. A (animals) & i.–iv.; pt. 323, pp. 25–50, pls. v.–x.; many figures copied from other authors, and some rather bad.

Marseniidæ.

Coriocella ophione (Gray). Animal and dentition; Hutton, Tr. N. Z. Inst. xv. p. 121, pl. xiii. fig. *w*.

Struthiolariidæ.

Struthiolaria papulosa (Martyn). Anatomical description, including dentition and operculum, by F. W. Hutton, Tr. N. Z. Inst. xv. p. 117, pl. xii.

Cerithiidæ.

Cerithidea bicarinata (Gray) and *nigra* (H. J.). Dentition; Hutton, Tr. N. Z. Inst. xv. pp. 122 & 123, pl. xiv. figs. *d* & *e*.

Planaxis semilævis, sp. n., Martens, Conchol. Mitth. ii. p. 151, Socotra.

Alaba rectangulata, Craven, Ann. Soc. mal. Belg. xv. [1880] p. xcvi., from Ceylon; figured, *op. cit.* xvii. pl. ii. fig. 4.

Melaniidæ.

Melania tuberculata (Müll.), *scabra* (Lam. [Müll.]), and *pagoda* (Lea), varieties, and *selateri*, sp. n., all from Socotra; Godwin-Austen, P. Z. S. 1883, pp. 5–8, pl. ii. figs. 1–11.

Melania pellicens, Sorong Island, *dominula* and *domani*, Aru Islands, *flyensis* and *epidromoides*, Fly River, spp. nn., and *singularis* (Tapp.-Can., 1876), all from New Guinea and adjacent islands; Tapparone-Canefri, Ann. Mus. Genov. xix. pp. 30, 31, 34, 39, 41, & 44, pl. i. figs. 12–19.

Melania acanthica (Lea), Solomon Islands and New Hebrides; Brazier, P. Linn. Soc. N. S. W. viii. p. 295.

Melania henriettæ (Gray) = *baccata* (Brot, *nec* Gould), *ebenina*, sp. n., Southern China, and notes on some other Chinese species by A. Brot, Nachr. mal. Ges. 1883, pp. 80–86.

Melania niponica (E. A. Sm.) varr. nn. *decipiens* and *trachea*, *M. japonica* (Rv.) var. n. *ornata*, Japan, and *M. lentiginosa* (Rv.) var. n. *nymphula*, Ceylon; Westerlund, Nachr. mal. Ges. 1883, pp. 56–58.

Melanopis prophetarum (Bourg., MS.), *turcica* (Parr.), *chantrei* and *lortetiana*, spp. nn., Locard, Arch. Mus. Lyon, iii. pp. 265–271, pl. xxiii. figs. 44–57, Lake of Antioch.

Melanopsis trifasciata (Gray). Dentition; Hutton, Tr. N. Z. Inst. xv. p. 123, pl. xiv. fig. *f*.

Pirenopsis costata (Quoy & Gaim., as *Melania*) from the New Hebrides; Brazier, P. Linn. Soc. N. S. W. viii. p. 294.

Turritellidæ.

Turritella sophiæ, new name for *incisa* (Tenison-Woods), preoccupied; Brazier, P. Linn. Soc. N. S. W. viii. p. 227.

Turritella rosea (Q. G.). Dentition; Hutton, Tr. N. Z. Inst. xv. p. 122, pl. xiv. fig. *c*.

Smithia, g. n. Near *Turritella*, but in the shape of a cork-screw; aperture simple, angulated at right hand, slightly withdrawing above; operculum multispiral. *S. gracilis*, sp. n., Gorée. Maltzan, Nachr. mal. Ges. 1883, pp. 97 & 98, with woodcut. [Name preoccupied in *Cœlenterata*, *Hymenoptera*, and *Lepidoptera*.—Rec.]

Litorinidæ.

Litorina. The known species, 105, enumerated, with their synonymy, by Weinkauff, JB. mal. Ges. x. pp. 213–227.

Iphitus, g. n. Shell conical, covered with spiral rows of tubercles; the apex consists of a cylindrical process of several whorls, which is closely striated lengthwise; operculum horny, paucispiral. Allied to *Fossarus*. *I. tuberatus*, sp. n., Atlantic. Jeffreys, P. Z. S. 1883, pp. 113 & 114, pl. xx. fig. 12. [Name preoccupied by Rafinesque, 1815, for a Pteropod, but quite obsolete.—Rec.]

Cithna (A. Adams, 1863) = *Hela* (Jeffr.); *C. cincta*, *carinata*, *adamsi*, and *naticiformis*, spp. nn., Atlantic: *id. l. c.* pp. 110–112, pl. xx. figs. 8–11.

Fossaria funiculata, sp. n., Australia, and *F. simsoni* (Ten.-Woods) = *petterdiana* (Crosse); Tenison-Woods, Tr. R. Soc. Vict. xvii. 1881, p. 81, fig. 6.

Rissoidæ.

Rissoa concinnata, sp. n., Jeffreys, Ann. N. H. (5) xi. p. 396, pl. xvi. fig. 2, off Crete, 70–120 fath.

Trachysma delicatum (Phil.) found alive in the inlet of the Jade, N.W. Germany; dentition that of the *Tænioglossa*: Poppe, Abh. Ver. Brem. viii. p. 364.

Nematura ceylonica, sp. n., Westerlund, Nachr. mal. Ges. 1883, p. 166, Ceylon.

Hydrobia ? balfouri, sp. n., H. H. Godwin-Austen, P. Z. S. 1883, p. 4, pl. i. fig. 4, Socotra.

Bythinella abbreviata (Mich.), found at Lausanne; Sterki, Nachr. mal. Ges. 1883, p. 74. *B. tornensis* (Haz.): radula; Hazay, Mal. Bl. (2) vi. p. 99, pl. vii. fig. 3.

Bythinella obtusa (Lea), Key West, in small ponds; the locality given by Lea is probably erroneous: Dall, P. U. S. Nat. Mus. vi. p. 334.

Bythiospeum. Generic name proposed for *Vitrella* (Clessin), this being preoccupied by Swainson [but not adopted by later authors, = *Akera*, Müller, 1776.—Rec.]. *B. letourneuxi*, Carinthia, and *africanum*, Algeria, spp. nn. Bourguignat, Bythiospeum, 1882.

Vitrella clessini and *kraussi*, spp. nn., Weinland, JH. Ver. Württ. 1883, pp. 124 & 125, woodcuts, and Nachr. mal. Ges. 1883, pp. 79 & 80, recent alluvial deposits of the river Jagst at Schönthal, Württemberg.

Paulia bourguignati, sp. n., Locard, Act. Soc. L. Lyon, 1883, Courtenot, Dép. Aube.

Avenionia, g. n., for *A. locardiana*, *vayssierii*, and *fabrii*, spp. nn., in wells and subterranean waters at Avignon; Nicolas, Mém. Ac. Vaucluse, 1882, p. 159. According to A. Locard, this genus = *Paulia*; the second species = *P. berenguieri*; the third is founded on a broken shell.

Pyrgula nevadensis, sp. n., Pyramid Lake and Walter's Lake, Nevada, Stearns, P. Ac. Philad. 1883, pp. 171–176, woodcut, and Am. Nat. xvii. p. 1296. [The correctness of the generic position remains to be proved

by examination of the radula, which, however, is not yet known even in the European typical species.—REC.]

Diana gredleri, sp. n., Neumayr, JB. Mineral. ii. p 24, Lake Talifu, Prov. Yunnan, China.

Tryonia protea (Gould). Two varieties, one smooth and the other finely cancellated, at Indio, in the Colorado Desert; Stearns, Am. Nat. xvii. p. 1015, woodcut.

Tryonia [?] sp., from Cooper's Creek, Central Australia, Saenger, Am. Nat. xvii. p. 1184, woodcut. [Perhaps a *Melania*.—REC.]

Lithoglyphus naticoides (Fér.), new appearance in Northern Germany, *vide suprà*, p. 36.

Lithoglyphus pannonicus (Frauenf.) belongs to *Bithynella*, according to the open perforation of the shell and the particularities of the radula; Hazay, Mal. Bl. (2) vi. pp. 98 & 99, pl. vii. fig. 4. Radula of *L. naticoides*, ibid. fig. 5.

PALUDINIDÆ.

P. Fagot's paper (*vide suprà*, p. 4) has not been seen by the Recorder.

Paludina. Some critical notes concerning Bourguignat's synonymy by Mme. Paulucci, Bull. Soc. mal. Ital. ix. pp. 8–10.

Paludina fasciata (Müll.) from the banks of the Niemen, Minsk, fully described, and its differences from *P. vera* (Frauenf.) [*listeri* (Forbes)] pointed out; the radula of the embryonal shells has a greater and less determined number of denticulations on the edge of the single teeth: Dybowski, Mal. Bl. (2) vi. pp. 71–87, pl. iii. The radula of the same two species, and of *P. hungarica*, comparatively described by Hazay, *l. c.* pp. 99 & 100, pl. vii. figs. 1 & 2.

Paludina vivipara (L.) var. *fasciata* (Pickering) = *unicolor* (Jeffr.), British localities; Taylor, J. of Conch. iv. p. 127.

Paludina decipiens and *paulucciana*, spp. nn., Tapparone-Canefri, Ann. Mus. Genov. xix. pp. 20 & 21, pl. i. figs. 1–4, Fly River, Southern New Guinea.

Paludina sp. from Cooper's Creek, Central Australia; Saenger, Am. Nat. xvii. pp. 1184, woodcut.

Vivipara margeriana (Nevill) = *Margaria melanoides* (Nevill). Varieties, with and without spiral keels; Neumayr, JB. Mineral. 1883, ii. p. 25, woodcut, Lake of Talifu, Yunnan.

Campeloma (Rafinesque, 1819) is to be re-established as a genus or subgenus of *Paludinidæ*, wrongly called *Melantho* by Binney and subsequent authors. Rafinesque's type was a sinistral specimen of *Paludina ponderosa* (Say), from the Ohio. *Melantho* is founded by its author, Bowdich, 1822, on a marine fossil from the Paris Basin. The geographical distribution of the species of this genus in North America is sketched out. R. Ellsworth Call, Am. Nat. xvii. pp. 603–608.

Bythinia tumida, sp. n., Westerlund, Nachr. mal. Ges. 1883, p. 166, Ceylon.

Digyreidum, g. n. Operculum spiral in the centre, concentrical in the periphery. *D. sennaaricum* = *Paludina sennaariensis* (Parr., Küst.)

Letourneux, in Locard's Prodr. Malacol. Franc. 1882, p. 224, and Bourguignat, Mal. Abyss. 1883, p. 130.

Valvatidæ.

Valvata cristata var. *delpretiana* (Paulucci); Stefani, Bull. Soc. mal. Ital. ix. p. 189, Apuan Mountains.

Valvata macrostoma var. n. *anapensis*, and *V. monterosati*, sp. n. (Cafici, MS.), Westerlund, Nachr. mal. Ges. 1883, pp. 169 & 170, Sicily.

Valvata depressa (C. Pfr.) var. n. *soluta*; O. Böttger, JB. mal. Ges. x. p. 343, Athens.

Valvata mergella, sp. n., Westerlund, Nachr. mal. Ges. 1883, p. 166, Port Clarence, N.W. America.

Calyptræidæ.

G. B. Sowerby treats of this family in his "Thesaurus Conchyliorum," describing and figuring 24 species of *Calyptra*, 12 of *Crucibulum*, 21 of *Trochita*, and 29 of *Crepidula*; pts. 39 & 40, pp. 55–74, pls. ccccxlv.–ccccliii. Several species distinguished by Broderip and others are reduced to varieties; the following are new or not before figured :—

Trochita helicoides and *lateralis*, spp. nn., *lamellosa* (A. Ad.?), and *fastigiata* (Gould), localities of all unknown; Sowerby, *l. c.* pp. 62–65, pls. ccccxlix. figs. 41, 53, 54, 63, & 64, & ccccl. figs. 72–74, 93, & 94.

Crepidula lentiginosa, sp. n., S. Africa, *fissurata*, sp. n., locality unknown, and (*Noicea*) *chinensis* (Gray), China; Sowerby, *l. c.* pp. 67–69, pl. ccccliii. figs. 130, 141, 142, & 151–154.

Crypta costata (Less.) and *monoxyla* (Q. & G.). Dentition; Hutton, Tr. N. Z. Inst. xv. p. 122, pl. xiv. figs. *a* & *b*.

Vermetidæ.

Vermetus lumbricalis (L.) var. n. *nigricans*; Dall, P. U. S. Nat. Mus. vi. p. 334, Florida.

Scalariidæ.

Scalaria tortilis, St. Thomas, W. Indies, 390 fath., *dentiscalpium*, Cape York, *acus*, W. of Azores, 1000 fath., *Globigerina*-ooze, and *funiculata*, off Pernambuco, 350 fath., spp. nn., Watson, J. L. S. xvi. pp. 607–609.

Crossea striata, sp. n., *id. l. c.* p. 609, Cape York.

Aclis attenuans, sp. n., Jeffreys, Ann. N. H. (5) xi. p. 396, pl. xvi. fig. 3, off Crete, 70–120 fath.

Aclis crenulata, sp. n., Folin, Moll. Andaman, p. 5, Andaman Islands.

pls.

Solariidæ.

Solarium (*Torinia*) *rosulentum*, sp. n., Watson, J. L. S. xvi. p. 610, off Port Jackson, 35 fath.

Brugnonia, g. n. Shell globosely conical, imperforate; pillar angu-

lated and spread out at its base. *B. pulchella*, sp. n., off Crete, 70–120 fath. Jeffreys, Ann. N. H. (5) xi. p. 399, pl. xvi. fig. 2. [Neither radula nor operculum known; the systematic place of this shell is consequently very uncertain.—REC.] It is possible that it may be the fry of *Cassis sulcosa*; Jeffreys, Ann. N. H. (5) xii. p. 67.

IANTHINIDÆ.

Ianthina exigua (Lam.). Dentition similar to that of *I. communis* (Lam.); Hutton, Tr. N. Z. Inst. xv. p. 123, pl. xiv. fig. *g*.

PYRAMIDELLIDÆ.

Pyramidella? vincta, sp. n., Dall, P. U. S. Nat. Mus. vi. p. 330, pl. x. fig. 7, Florida.

Odostomia electa, sp. n., Jeffreys, P. Z. S. 1883, p. 394, Färoe Channel, warm area.

Odostomia brevicula, sp. n., *id.* Ann. N. H. (5) xi. p. 397, pl. xvi. fig. 4, off Crete, 70–120 fath.

Odostomia canaliculata, *ellipsoidea*, and *vitrea*, spp. nn., Folin, Moll. Andaman, pp. 15 & 16, Andaman Islands.

Odostomella and *Parthenina*, subgg. nn. of *Odostomia*. Types, *O. doliolum* (Phil.) and *interstincta* (Mont.), and *O. monterosatoi*, *jeffreysi*, and *penchynati* [*penchinati*], spp. nn., Bucquoy, Dautzenberg & Dollfus, Moll. mar. du Roussillon, fasc. iv.

Turbonilla viridaria, *virgo*, and *punicea*, spp. nn., Dall, P. U. S. Nat. Mus. vi. p. 332, Florida.

Turbonilla tæniata, *vittata*, *wood-masoni*, *microcheilos*[*-chilus*], *intuslirata*, spp. nn., *corpulenta* (Fol.) var. n. *minima*, and note on *tumidula* (Fol.); Folin, Moll. Andaman, pp. 6–9, all from Andaman Islands.

Noemia arcte-lirata and *megacheilos*[*-chilus*], spp. nn., *id. l. c.* pp. 14 & 15, Andaman Islands.

Dunkeria late-lirata, sp. n., *id. l. c.* p. 5, Andaman Islands.

Chemnitzia subemarginata, sp. n., *id. l. c.* p. 4, Andaman Islands.

Parthenia cedrosa, sp. n., Dall, P. U. S. Nat. Mus. vi. p. 351, pl. x. fig. 11, Florida.

Parthenia fallax and *nevilli*, spp. nn., Folin, Moll. Andaman, pp. 10 & 11, Andaman Islands.

Eulimella infundibulata and *cylindropsis*, spp. nn., *id. l. c.* pp. 3 & 4, Andaman Islands, the former also at Hongkong.

Menestho albula (Möller) from Labrador; K. Bush, P. U. S. Nat. Mus. vi. p. 242, pl. ix. fig. 11.

Monoptygma exigua (Sow.). Locality unknown; the only recent representative of the true *Monoptygma* (Lea), the other recent species referred to it belonging to the *Actæonidæ*; Tryon, Manual of Conchology, v. p. 91, pl. xxxvii. fig. 1.

Mathilda. List of known species, most of them Tertiary fossils, 9 recent, by Boury, J. de Conch. xxxi. pp. 110–125. Description of *M. magellanica* (Fischer, 1872); *l. c.* p. 405.

EULIMIDÆ.

Eulima acutalis and *perminima*, spp. nn., Jeffreys, Ann. N. H. (5) xi. pp. 397 & 398, off Crete, 70–120 fath.

Eulima psila, *fasciata*, *chaunax*, *chascanon*, *hians*, *chydæa*, *cylindrata*, *gomphus*, and *hyalina*, St. Thomas, W. Indies, 390 fath., *ephamilla*, *sarissa*, and *hebes*, off Pernambuco, 350 fath., *famelica*, Azores, 450 fath., *chyta*, Ascension Island, 420 fath., *oxytata*, Basilan Strait, *acanthyllis*, Honolulu, 40 fath., *acerrima*, *campyla*, and *eurychada*, Rain Island, N. Australia, 155 fath., *latipes*, Torres Straits, *fallax*, Fiji, *amblia*, between Marion and Prince Edward's Island, 46° S. lat., 50–100 fath., *dissimilis*, Port Jackson, spp. nn., Watson, J. L. S. xvii. pp. 112–129.

Eulima (*Liostraca*) *hemphilli*, sp. n., Dall, P. U. S. Nat. Mus. vi. p. 330, pl. x. fig. 4, Florida.

Stylifer brychius, sp. n., Watson, J. L. S. xvii. p. 130, South Atlantic, 36° S. lat., 46° W. long., 2650 fath.

Hylopsis polyskista[*-schista*] and *textus*[*-a*], spp. nn., Folin, Moll. Andaman, pp. 11 & 12, Andaman Islands.

RHIPIDOGLOSSA.

NERITIDÆ.

Nerita. 81 species described and figured by Sowerby, Thes. Conch. pt. 40, pp. 105–120, pls. ccccIxiii.–ccccIxviii. The following appear not to have been figured before:—*N. birmanica* (Philippi), p. 107, pl. ccccIxvii. fig. 82, Burma, *excavata*, sp. n., p. 109, pl. ccccIxvii. fig. 84, locality unknown, *stricta* (Baird, MS.), p. 107, pl. ccccIxviii. fig. 118, locality unknown, and *samoensis* (Dunk.), p. 118, pl. ccccxviii. fig. 123, Samoa Islands.

Nerita atrata (Lam.). Dentition; Hutton, Tr. N. Z. Inst. xv. p. 123, pl. xiv. fig. *h*.

Neritina (*Clithon*) *nordquisti*, sp. n., Westerlund, Nachr. mal. Ges. 1883, p. 56, Japan.

Neritina consimilis (Martens) and *souverbiana* (Montrouzier). Notes on them by Morelet, J. de Conch. xxxi. p. 202.

Neritina (*Clithon*) *rhytidophora*, (*Smaragdia*) *viridissima* and *semen*, spp. nn., all from Sorong Island, New Guinea, Tapparone-Canefri, Ann. Mus. Genov. xix. pp. 76, 80, & 81, pl. i. figs. 5–11.

Septaria pulcherrima, new name for *suborbicularis* (Sow.) var. *fusco-radiata* (Martens), New Guinea and Philippines; *id. l. c.* p. 85.

TROCHIDÆ.

Phasianella petiti, sp. n., Craven, Ann. Soc. mal. Belg. xvii. p. 18, pl. ii. fig. 3, Landana, mouth of the Congo.

Tricoliella, subg. n. Type, *Phasianella pulla* (L.); Monterosato, Nat. Sicil. iii. p. 110.

Turbo peloritanus (Cantraine) = *Trochus filosus* (Philippi), and its var. *carinata* = *T. carinatus* (Cantr.) = *Trochus glabratus* (Philippi), Mediterranean, Bay of Biscay, and Florida, Jeffreys, P. Z. S. 1883, p. 108.

Diloma plumbea [*-um*], sp. n., New Zealand and Campbell Island, and dentition of *D. æthiops* (Gm.), *nigerrima* (Chemn.), *undulosa* (Ad.), *corrosa* (Ad.) = *hectori* (Hutt.), *excavata* (Ad.), and ? *subrostrata* (Gray); Hutton, Tr. N. Z. Inst. xv. pp. 125 & 126, pl. xv. figs. *a–g*.

Calcar cookii (Chemn.). Dentition; *id. l. c.* p. 125, pl. xiv. fig. *p*.

Cyclostrema tenerum, *valvatoides*, *simile*, *affine*, and *bithynoides*, spp. nn., Jeffreys, P. Z. S. 1883, pp. 91–93, pl. xix. figs. 2–6, Atlantic.

Cyclostrema minutum, sp. n., Jeffreys, Ann. N. H. (5) xi. p. 395, pl. xvi. fig. 1, off Crete, 70–120 fath.

Adeorbis exquisitus, sp. n., *id. l. c.* p. 399, pl. xvi. fig. 8, off Crete, 70–120 fath.

Trochus umbilicatus (Montagu) perhaps = *divaricatus* (L.) [?, Rec.]; living animal of var. *agathensis* (Recl.) described; *T. striatus* (L.) and *exasperatus* (Penn.), remarks concerning their synonymy; *T. miliaris* (Brocchi, fossil) = *millegranus* (Philippi): Jeffreys, P. Z. S. 1883, pp. 102–105.

Trochus (*Oxystele*) *euspira* (Dall, as *Bathymophila*), West Indies, 390–805 fath., and *suturalis* (Philippi, as fossil) = *folini* (Fischer), Bay of Biscay and Gulf of Marseilles, 174–1025 fath., living animal described; *id. l. c.* pp. 98 & 99, the former pl. xx. fig. 6.

Huttonia bella (Hutt.). Dentition; Hutton, Tr. N. Z. Inst. xv. p. 123, pl. xiv. fig. *i*.

Gibbula vimontiæ, sp. n., Monterosato, Nat. Sicil. iii. p. 106, Palermo.

Gibbula gorgonarum, sp. n., Fischer, J. de Conch. xxxi. p. 393, Cape Verde Islands, 410–596 metres.

Gibbula oppressa (Hutt.). Dentition; Hutton, Tr. N. Z. Inst. xv. p. 124, pl. xiv. fig. *m*.

Gibbula tesserula, sp. n., Tenison-Woods, Tr. R. Soc. Vict. xvii. 1881, p. 81, figs. 3–5, Victoria.

Gibbulastra, g. n. Type, *Trochus divaricatus* (L.); Monterosato, Nat. Sicil. iii. p. 107.

Anthora tuberculata (Gray). Dentition; Hutton, Tr. N. Z. Inst. xv. p. 124, pl. xiv. fig. *k*.

Zizyphinus selectus (Chemn.). Dentition; *id. ibid.* pl. xiv. fig. *l*.

Zizyphinus aquistriatus, sp. n., Monterosato, Nat. Sicil. iii. p. 108, Palermo.

Jujubinus, subg. n. Type, *Trochus matoni* (Payr.); *id. ibid.*

Cantharidus purpuratus (Martyn). Dentition; Hutton, Tr. N. Z. Inst. xv. p. 124, pl. xiv. fig. *o*.

Margarita ? *inconspicua* (Hutt.). Dentition similar to that of the preceding; *id. ibid.* pl. xiv. fig. *n*.

Trochus (*Margarita*) *fulgidus*, *minutulus*, *laminarum*, and *cancellatus*, spp. nn.; *T. cinctus* (Philippi, 1836, fossil) = *amabilis* (Jeffr.); and *ottoi* (Philippi, 1846, fossil) = *Margarita regalis* (Verrill & Smith) = *T. rhysus*

and *ægleis* (Watson) = *T. vaillanti* (Fischer), Atlantic ; Jeffreys, P. Z. S. 1883, pp. 95–98, the new species pl. xx. figs. 1–4.

Tharsis, g. n. Shell globular, solid and glossy ; peristome circular and continuous, attached to the pillar ; base closed by a pad or thick testaceous layer in the adult, perforated in the young; operculum horny, multispiral. *T. romettensis* (Seguenza, as *Oxystele*), Mediterranean and Atlantic. Jeffreys, P. Z. S. 1883, p. 93, pl. xix. fig. 7. [Name preoccupied by Giebel, 1847, for a fossil Ganoid.—REC.]

Ganesa, g. n. Shell shaped like a *Natica*, thin ; peristome continuous, free and separate in the young, but united to the periphery in the adult ; spire having an oblique axis ; base perforated, not umbilicate ; operculum horny, multispiral. *G. pruinosa*, Atlantic, and *nitidiuscula*, between the Hebrides and Färoes, 570 fath., spp. nn., Jeffreys, *l. c.* p. 94, pl. xix. figs. 8 & 9.

Circulus (Jeffreys, 1865, as a subgenus). Shell forming a circular compressed disk, slightly nacreous; mouth quadrangular, with a discontinuous peristome ; umbilicus very wide ; operculum multispiral. *C. striatus* = *Valvata striata* (Philippi) = *Solarium philippii* (Cantraine) = *Delphinula duminii* (Requien), Atlantic and Mediterranean ; Jeffreys, *l. c.* pp. 94 & 95.

HALIOTIDÆ.

Scissurella umbilicata, sp. n., Jeffreys, P. Z. S. 1883, p. 88, pl. xix. fig. 1, Atlantic.

Haliotis. H. C. Weinkauff gives a monograph of this genus, describing and figuring 72 species; many of them are only copied from Reeve or Sowerby; the figures are generally rather bad. *H. strigata*, new name for *striata* (Gmel., *nec* Lin.) = *rugosa* (Reeve, *nec* Lam.), locality unknown, p. 20 ; *exigua* (Dkr., not before described), p. 29, pl. xiii. figs. 2 & 3, Fiji and Samoa Islands ; *subvirginea*, new name for *virginea* (Dunk. & Sow., *nec* Chemn.), and *gibba* (Reeve, *nec* Philippi), Lower Guinea, p. 33, pls. xiii. figs. 7 & 8, & xvii. figs. 1 & 2 ; *H. maculata* (Küster, 1840) = *coccinea* (Reeve, 1846), p. 83. Küster's Conch. Cab. pts. 322, 324, 326 & 327, 88 pp., pls. vii.–xxx.

Haliotis iris (Martyn). Animal and dentition ; Hutton, Tr. N. Z Inst. xv. p. 127, pl. xv. fig. *h*.

FISSURELLIDÆ.

Zeidora naufraga, sp. n., Watson, J. L. S. xvii. p. 27, off St. Thomas, W. India, 390 fath. The author suggests that this genus may belong to the *Opisthobranchia*, and that *Crepidemarginula* (Seguenza) is identical with it.

Parmophorus unguis (L.). Dentition ; Hutton, Tr. N. Z. Inst. xv. p. 127, pl. xv. fig. *i*.

Tugalia intermedia (Reeve) = *cinerea* and *ossea* (Sow.) = *australis* (Tenison-Woods), Port Jackson, Victoria, and Tasmania; Brazier, P. Linn. Soc. N. S. W. viii. p. 227.

Puncturella agger, *plecta*, *oxia*, and *sportella*, spp. nn., and *profundi*

(Jeffr.), off St. Thomas, 390 fath., *brychia*, sp. n., Nova Scotia, 1340 fath.; Watson, J. L. S. xvi. pp. 32–37.

Puncturella (*Cranopsis*) *asturiana* (Fischer) and *granulata* (Seguenza), off St. Thomas, 390 fath.; *id. l. c.* pp. 29–31.

Puncturella (*Fissurisepta*) *rostrata* (Seguenza), same locality; *id. l. c.* p. 38.

Lucapina ? *fasciata* (Pfr.) from Florida. Soft parts described; they differ from those of *L. crenulata* (Sow.): Dall, P. U. S. Nat. Mus. vi. p. 336.

Cocculinidæ.

Cocculina. Males rarer than females; they have a verge which is permanently exserted from the inner side of the right tentacle: Dall, Science, i. p. 130.

Cocculina spinigera and *corrugata*, spp. nn., Jeffreys, P. Z. S. 1883, pp. 393 & 394, pl. xliv. figs 1 & 2, Färoe Channel, warm area.

Cocculina angulata, sp. n., Watson, J. L. S. xvii. p. 38, radula, woodcut, p. 40, Philippines.

CYCLOBRANCHIA.

Acmæidæ.

Acmæ aconoidea (Q. & G.), *corticata* (Hutt.), *pileopsis* and *flammea* (Q. & G.): animals and dentition; Hutton, Tr. N. Z. Inst. xv. pp. 127 & 128, pl. xv. figs. *k–n*. *A. flammea* and *conoidea* (Q. & G.): shells described; *id. l. c.* p. 132.

Patellidæ.

Patella vulgata (L.) and *athletica* (Bouch.). Biological notes; Daniel, J. de Conch. xxxi. p. 333.

Patella aculeata (Rv.) = *squamifera* (Rv.), Port Jackson and Tasmania; Brazier, P. Linn. Soc. N. S. W. viii. p. 224.

Patella magellanica (Martyn) from the Auckland Islands, *denticulata* (Martyn) = *luctuosa* (Gould), *illuminata* (Gould), and *olivacea*, sp. n., New Zealand. Dentition; Hutton, Tr. N. Z. Inst. xv. p. 128, pl. xvi. figs. *a–d*; shell of the last, p. 133.

Patellastra, g. n. Type, *Patella lusitanica* (Gmel.); Monterosato, Nat. Sicil. iii. p. 103.

Helcion pellucidum (L.) and *corneum* (Gerville) [*lævis*, Penn.]. On their occurrence at Brest; Daniel, J. de Conch. xxxi. pp. 333–335.

Chitonidæ.

B. Haller continues his anatomical researches on *Chiton siculus* (Gray) and some other species. He describes the structure of the buccal muscles, states the want of auditory organs, but describes sensitive cells, which are destined probably for taste, on an elevation of the floor of the oral cavity, beneath the radula; an analogous "subradular organ" is also

found in *Patella*. He discusses the gills of *Chiton*, and states that their arrangement exhibits two different types; in one, exemplified by *C. siculus*, they reach nearly along the whole side of the body, and their number is thirty-two on each side; in the other, exemplified by *C. lævis* (Penn.), they begin considerably more behind, and their number is only fourteen. Each leaflet of the gills is itself composed of laminæ, numbering twenty-three in the larger gills of *C. siculus* and *fascicularis*; each single leaflet is, therefore, homologous to a whole gill of other *Mollusca*. Arb. z. Inst. Wien, v. pt. 1, 32 pp., 3 pls.; abstracts in J. R. Micr. Soc. (2) iii. pp. 38–40, 495, & 496, and in Arch. Z. expér. (2) i. pp. xiv.–xvi.

J. VAN BEMMELEN, Zool. Anz. 1883, pp. 361–365, observes that the number of the gills in the *Chitonidæ* varies from fourteen to seventy-five, and their number is not always in proportion to the relative length of the whole row of them along the sides of the animal. A microscopical examination of decalcified shells of the *Chitonidæ* leads to the conclusion that only the articulamenta, or lower colourless layers, are homologous to the shells of other *Mollusca*, and that the tegmentum, or upper sculptured layer, of the shells of *Chiton*, however calcareous, belongs to a cuticular formation, and is homologous to the cuticula of *Neomenia*.

Chiton lævis (Penn.) at Trieste; Haller, *l. c.* p. 21.

Chiton pellis-serpentis (Q. & G.) and *glaucus* (Gray). Dentition; Hutton, Tr. N. Z. Inst. xv. p. 129, pl. xvi. figs. *i* & *f*.

Chiton inornatus, sp. n., Tenison-Woods, Tr. R. Soc. Vict. xvii. p. 82, figs. 8 & 9, Victoria.

Acanthochites zealandicus (Q. & G.). Dentition; Hutton, *l. c.* p. 129, pl. xvi. fig. *g*.

Cryptoconchus porosus (Burrow). Dentition; *id. ibid.* pl. xvi. fig. *h*.

TECTIBRANCHIA.

ACTÆONIDÆ.

Actæon turritus, St. Thomas, 390 fath., *amabilis*, West of Azores and off Palma, Canaries, 1000 and 1125 fath., *austrinus*, Bass's Strait, 38–40 fath., *A.* (*Actæonina*) *edentulus*, Kerguelen, 60 fath., and *chariis*, Azores, 1000 fath., *A.* (*Buccinulus*) *cinereus*, Fiji, 12 fath., spp. nn., Watson, J. L. S. xvii. pp. 284–289.

Ringicula. The 3 recent species of the Mediterranean, *auriculata* (Menard), *conformis* (Monterosato), and *leptochila* (Brugnone), with several Tertiary species, described, and the 2 former figured, by SEGUENZA, Atti Acc. Rom. Mem. ix. pp. 344–390, 2 pls.

Ringicula pusilla and *assularum*, Torres Straits, *peracuta*, St. Thomas and off Bermudas, 390, 1073, & 350 fath., spp. nn., Watson, J. L. S. xvii. pp. 290–292.

BULLIDÆ.

Cylichna discus, St. Thomas, 390 fath., *noronyensis*, Fernando de Noronha, 25 fath., *tahitensis*, Tahiti, *crispula*, Torres Straits, 155 fath., *reti-*

culata and *subreticulata*, Cape York, *labiata*, Amboyna, *C.* (*Volvula*) *pauperc*ula, St. Thomas, 390 fath., and *sulcata*, Torres Straits, spp. nn., Watson, J. L. S. xvii. pp. 319–326.

Cryptaxis, g. n. Between *Cylichna* and *Utriculus*, but the spire partly concealed. *C.* (*Cylichna*) *parvula*, sp. n., Mediterranean, Jeffreys, Ann. N. H. (5) xi. p. 400, pl. xvi. fig. 9. *C. crebripunctatus*, sp. n., Färoe Channel, warm area, *id.* P. Z. S. 1883, p. 398, pl. xliv. fig. 11.

Utriculus oliviformis and *leucus*, West of Azores, 1000 fath., *tornatus*, Teneriffe, 78 fath., *spatha*, St. Thomas, 390 fath., *oryctus*, Ascension, 420 fath., *complanatus*, *amphizostus*, and *simillimus*, Cape York, *famelicus*, Fiji, spp. nn., Watson, J. L. S. xvii. pp. 332–340.

Utriculus (*Tornatina*) *leptelæs*, Rain Island, N. Australia, 155 fath., *aratus*, Cape York, *avenarius*, Port Jackson, *pachys*, N.E. from New Zealand, 700 fath., *amboynensis*, Amboyna, and *acrobeles*, locality not stated, spp. nn., *id. l. c.* pp. 327–331.

Atys hyalina, sp. n., *id. l. c.* p. 341, Cape York.

Scaphander gracilis, Azores, 1000 fath., *Globigerina*-ooze, *mundus*, off Aru Islands, W. of Papua, 800 fath., and *niveus*, S.E. of Philippines, 500 fath., *Globigerina*-ooze, spp. nn., *id. l. c.* pp. 342–345.

Aplysiidæ.

Dolabrifera triangularis, sp. n., Watson, *l. c.* p. 346, Simon's Bay, S. Africa, 10–20 fath.

Aplysia limacina (L.) = *fasciata* (Poir.) = *camelus* (Cuv.), and other species found at Naples incidentally mentioned by F. Blochmann, Z. wiss. Zool. xxxviii. p. 392, footnote, 393, & 394. See also Brock, *op. cit.* xxxix. p. 6, and Cunningham, MT. z. Stat. Neap. iv. pp. 421 & 422.

Aplysia tryoni (Mein.). Dentition; Hutton, Tr. N. Z. Inst. xv. p. 118, pl. xiii. fig. *a*.

Pleurobranchidæ.

Tylodina. Anatomical description by A. Vayssière, Ann. Sci. Nat. (6) xv. No. 1, pp. 28–44, pl. ii. figs. 22–35.

Bertinia, g. n. Near *Umbrella*; shell calcareous, patelloid, oval, thin-edged, summit subcentral, inclined towards the shorter extremity, which is unguiculated, and shows distinct muscular impressions. *B. bertinia*, sp. n., Japan, Jousseaume, Bull. Soc. Zool. viii. p. 194, pl. x. figs. 6–8.

Peltidæ.

Pelta, Quatrefages, 1844, = *Runcina*, Forbes, 1853, = *Chalidis*, Philippi, 1852. Type of a new family *Peltidæ* among the *Tectibranchia*; a distinct gill on the right side under the edge of the mantle, no dorsal tentacles; male organ in the anterior part of the body, far distant from the rest of the genital organs; radula composed of a median and on each side one lateral tooth, both with reflexed denticulated front edge; four strong masticatory plates in the stomach. *P. coronata* (Quatref.) = *R.*

hancocki (Forbes), English Channel and Gulf of Marseilles, on the stalks of *Cystosira amentacea*. A. Vayssière, Ann. Sci. Nat. (6) xv. No. 1, pp. 1–28, pls. i. & ii. figs. 1–21.

NUDIBRANCHIA.

The 13th part of R. Bergh's "Malacologische Untersuchungen," pp. 547–601, pls. lxii.–lxv., being a part of Semper's "Reisen im Archipel der Philippinen," and issued 1878, has hitherto been omitted from Zool. Rec.; as also has Collingwood's paper on some *Nudibranchia* of the Eastern Seas, Tr. L. S. (2) ii. pt. 2 [1881]. The latter observes that an undetermined species of *Doris* throws off the prominent parts of the mantle in foul water, p. 125.

Phyllidiidæ.

Phyllidia spectabilis, sp. n., Collingwood, Tr. L. S. (2) ii. [1881] p. 136, pl. x. figs. 19–23, West coast of Borneo.

Fryeria variabilis, sp. n., *id. l. c.* p. 137, pl. x. figs. 24–28, West coast of Borneo.

Doridiдæ.

Doris pecten, Kelung, N. Formosa, and *crescentica*, Fiery Cross Reef, China Sea, spp. nn., Collingwood, *l. c.* pp. 126 & 127, pl. ix. figs. 1–8.

Albania, g. n. Near *Hexabranchus*; body depressed, soft, semi-transparent; mantle ample, undulated, and turned up at the sides; dorsal tentacles flexible, without sheaths; branchiæ consisting of about seven compound leaflets, each separately retractile; head with a bilobated crenated veil. *A. formosa*, sp. n., Kelung, N. Formosa, Collingwood, *l. c.* pp. 132 & 133, pl. x. figs. 1–5.

Hexabranchus (Ehrenb.). List of known species: *H. faustus*, Pelew Islands, *anaiteus*, New Hebrides, *petersi*, Mozambique, and *notatus*, Tonga, spp. nn.: Bergh, in Semper's Reis. Arch. Philipp. ii. 2, pt. 13, pp. 547–566 [1878].

Audura, g. n. "Forma corporis depressa, notæum sublæve, minutissime villosum. Tentacula digitiformia. Branchia foliis bipinnatis. Podarium margine anteriore bilabiatum, labio superiore latiore, medio diviso. Armatura labialis e baculis minutis inæqualibus formata. Lingua rhachide nuda, pleuris multidentatis; dentes hamati. Ventriculus liber. Penis hamo armatus; hasta amatoria?" Allied to *Discodoris* (Bergh, 1877). *A. maima*, sp. n., Philippines, Bergh, *l. c.* pp. 567–571, pl. lvii. figs. 13–24.

Halla, g. n. "Forma corporis sat depressa. Corpus molle, supra læve. Tentacula nulla. Branchia e foliis simpliciter lamellatis composita. Podarium non latum, antice emarginatum et lobo utrinque capiti connatum. Armatura labialis e hamulis minutis formata. Radula rhachide nuda, pleuris pluridentatis; dens primus latus, a reliquis diversus, reliqui subhamati, erecti, margine externo denticulato. Penis inermis." Allied to *Trippa* (Bergh). *H. decorata*, sp. n., Philippines, Bergh, *l. c.* pp. 572–574, pl. lviii. figs. 19–29.

Thorunna, g. n. "Forma corporis ut in Chromodoridibus. Branchia foliis simpliciter pinnatis. Armatura labialis nulla. Radula rhachide nuda, pleuris multidentatis; dens intimus a reliquis diversus, latus, apice hamato denticulato; dentes reliqui hamati, apice bifidi." *T. furtiva*, sp. n., Philippines, Bergh, *l. c.* p. 575, pls. lviii. figs. 30–32, & lxiii. figs. 17–19.

Staurodoris, new name for *Doridigitata* (Orb.) = *Glossodoris*, pt. (Gray). "Corpus subdepressum, supra tuberculatum. Rhinophoria et branchia retractilia, tuberculis valviformibus elongatis defensa. Armatura labialis nulla. Lingua rhachide nuda, pleuris multidentatis, dentibus hamatis. Penis inermis." Includes *Doris verrucosa* (Cuv.), from the Mediterranean, *D. bertheloti* (Orb.), *dorbignii* (Gray), and *januarii*, sp. n., Brazil; the first and last described by Bergh, *l. c.* pp. 578–585, pls. lxiii. figs. 20–24, & lxiv. figs. 2–12.

Spharodoris (Bergh, 1877) *punctata* and *papillata*, spp. nn., Philippines, *id. l. c.* pp. 586–592, pl. lxv. figs. 14–26.

Phlegmodoris, g. n. "Corpus molle, quasi subgelatinosum, dorso tuberculoso. Tentacula pro majore parte affixa, applanata. Branchia e foliolis tripinnatis paucis formata. Podarium sat latum, sulco marginali anteriore non profundo, labio superiore capiti affixo. Armatura labialis nulla. Radula rhachide nuda, pleuris multidentatis; dentes intimi forma simpliciore, reliqui hamati. Penis inermis." *P. mephitica*, sp. n., Philippines; probably also *Doris areolata* (Ald. & Hanc., 1864) and *spangiosa* (Kelaart) belong to this genus. Bergh, *l. c.* pp. 593–597.

Fracassa, g. n. "Corpus submolle, supra subnodulosum. Tentacula parva, conica. Branchia e foliis tripinnatis paucis formata. Podarium sat latum, sulco marginali anteriore sat profundo, labio superiore fisso. Armatura labialis: lamellæ duæ e baculis minutis formatæ. Radula rhachide nuda, pleuris multidentatis, dentibus hamatis. Penis inermis." Allied to the preceding genus. *F. zibethina*, sp. n., Philippines, Bergh, *l. c.* pp. 598–601.

Chromodoris iris, Pescadores Islands, *bullocki*, Recruit Island, North Pacific, *aureo-purpurea*, Haitan Straits, China Sea, *tumulifera*, Labuan, *tenuis*, Fiery Cross Reef, China Sea, *funerea*, Labuan, and *alderi*, Kelung, North Formosa, Collingwood, Tr. L. S. (2) ii. pp. 127–132, pl. ix. figs. 9–37.

Doridopsidæ.

Doridopsis arborescens, sp. n., Haitan Straits, China, and *rubra* (Kelaart), Singapore; Collingwood, *l. c.* pp. 134 & 135, pl. x. figs. 13–18.

Polyceridæ.

Triopa principis-walliæ, sp. n., Collingwood, *l. c.* p. 133, pl. x. figs. 6–11, Haitan Straits, China.

Trevelyana felis, sp. n., young state, Pescadores Islands, *id. l. c.* p. 134, pl. x. figs. 12–14.

Tritoniidæ.

Marionia (Vayssière, 1877). General form as in *Tritonia*; frontal hea[illegible] provided with numerous compound finger-shaped prolongations; stomach arm[illegible]d with strong plates. *M. quadrilatera* (Schultz) and *blainvillea* (Risso, both as *Tritonia*) = *decaphylla* (Cantr.) = *berghi* (Vayssière), both from the Mediterranean, and anatomically described, the former also figured from living specimen; *M. affinis*, sp. n., Naples, and *T. tethydea* (Delle Chiaje), are doubtful as specifically distinct, as well as *acuminata* (Costa), *costæ* and *meyeri* (Verany). *T. elegans* (Aud.) = *glauca* (Leuck.), and *T. cyanobranchiata* (Leuck.), are species of *Marionia*, living in the Red Sea. Bergh, MT. z. Stat. Neap. iv. pp. 303–326, pl. i.

Tethys leporina (L.). Habits of living specimen, swimming, food, &c.; Bergh, Verh. z.-b. Wien, xxxii. pp. 67 & 68.

Scyllæa pelagica (L.). Specimens from the China Sea and spawn described; Collingwood, Tr. L. S. (2) ii. pp. 137 & 138, pl. x. figs. 29–33, and woodcut.

Dendronotidæ.

Lomanotus genei (Verany). Living specimen found at Trieste, externally described by Bergh, Verh. z.-b. Wien, xxxii. pp. 66 & 67.

Lomanotus eisigi, sp. n., Trinchese, Rend. Acc. Nap. 1883, fasc. iii., Mediterranean.

Bornella marmorata, sp. n., Collingwood, *l. c.* p. 138, pl. x. figs. 34–38, Aden.

Melibœidæ.

Doto coronata (Gmel.), *costæ*, *cornaliæ*, *rosea*, *aurea*, *cinerea*, *splendida*, *paulinæ*, spp. nn., Trinchese, Æolid. ii. pp. 89–96, pls. lii.–lxi., Genoa.

Æolidiidæ.

Observations on embryology, including descriptions of the eggs, development, and embryonal shells of *Ercolania siottii*, *Coryphella landsburgi*, *Amphorina cærulea*, *Janus cristatus*, and *Favorinus albus*; S. Trinchese, Æolid. ii. pp. 106–109, pls. lxxii.–lxxx.

Æolis gracilis, sp. n., T. W. Kirk, Tr. N. Z. Inst. xv. p. 217, woodcut, Napier, North Island, New Zealand.

Æolidiella sæmmeringi (Bergh, *nec* Leuck.), Trieste. External and anatomical description; Bergh, Verh. z.-b. Wien, xxxii. pp. 8–12, pls. v. figs. 1–5, & vi. figs. 1–3.

Æolidiella (Bergh, 1867) *glauca* (Ald. & Hanc.). External and anatomical description; Trinchese, Æolid. ii. pp. 23–30, pls. vi.–viii.

pls. *Berghia* (Trinchese, 1877) *cærulescens* (Laurillard, *Eolidia*), Mediterranean. External and anatomical description; Bergh, Verh. z.-b. Wien, xxxii. pp. 20–23, pls. i. figs. 1–9, & ii. fig. 17. The same, = *Flabellina vermicornis* (Costa), fully described by Trinchese, Æolid. ii. pp. 5–22, pls. i.–v.

Facelina (Ald. & Hanc.). List of 10 known species, and anatomical description of *F. drummondi* (Thomps.); Bergh, Verh. z.-b. Wien, xxxii. pp. 24–26.

Facelina punctata (Ald. & Hanc.): *F. drummondi* (Thomps.) = *panizzæ* and *jani* (Verany) = *gigas* (Costa), and *F. coronata* (Forb.): external and anatomical descriptions; Trinchese, *l. c.* pp. 31–66, pls. ix.–xxx.A & lxxi.

Coryphella landsburgi (Ald. & Hanc.) and *lineata* (Lovén). External and anatomical description; *id. l. c.* pp. 97–105, pls. lxii.–lxx.

Favorinus versicolor (Costa) and *albus* (Ald. & Hanc.). Specimens from Trieste externally and anatomically described; Bergh, Verh. z.-b. Wien, xxxii. pp. 38–43, pls. v. fig. 6, & vi. figs. 4–11.

Favorinus albus (Ald. & Hanc.) and *versicolor* (Costa). External and anatomical description; Trinchese, Æolid. ii. pp. 67–74, pls. xxxi.–xxxv.

Calma cavolinii (Verany). Externally and anatomically described by Bergh, Verh. z.-b. Wien, xxxii. pp. 61–64, pl. v. figs. 7–11.

Spurilla neapolitana (Chiaje) from Trieste. External and anatomical description; *id. l. c.* pp. 13–18, pl. i. figs. 10–21.

Galvina. List of known species; *G. flava* (Trinchese), *picta* (Ald. & Hanc.) with var. n. *pallida*, from Trieste, externally and anatomically described; *id. l. c.* pp. 43–53, pls. ii. figs. 1–11, iii. figs. 10–14, & iv. figs. 1–3.

Amphorina alberti (Quatref.) and *cærulea* (Montagu). Specimens of both from Trieste, externally and anatomically described; *id. l. c.* pp. 54–61, pls. iv. figs. 1–24, & vi. figs. 19–21.

Acanthopsole (Trinchese, 1871). List of known species; *A. lugubris* (Graeffe, MS.), *albina* and *vicina*, spp. nn., all from Trieste, externally and anatomically described; *id. l. c.* pp. 26–37, pls. ii. figs. 12–16, iii. figs. 1–9, & vi. figs. 1–18.

Janus cristatus (Chiaje). Jaw and radula described; *id. l. c.* p. 65, pl. v. figs. 12 & 13. The same fully described by Trinchese, Æolid. ii. pp. 75–88, pls. xxxvi.–li.

Hermæidæ.

Calliopæa felina, sp. n., external form and dentition; Hutton, Tr. N. Z. Inst. xv. p. 118, pl. xiii. fig. *b*, and p. 133, woodcut, Lyttelton Harbour, New Zealand.

Limapontiidæ.

Pelta. [See *Tectibranchia.*]

PULMONATA.

Agnatha.

Selenochlamys, g. n. Shield (mantle) very small, near the hinder end of the animal, containing the respiratory orifice in its anterior part on the right side; no internal shell. *S. pallida*, sp. n., from Kutais, Trans-

caucasia, Böttger, JB. mal. Ges. x. p. 142, pl. v. fig. 1. Radula not described.

Testacella haliotidea (F. B.). In twenty-four hours, 25 specimens devoured 25 earthworms and an equal number of *Limax agrestis* ; F. E. Lowe, Rep. Brit. Ass., 53rd Meeting, 1883. p. 549.

Testacella vagans, sp. n., Hutton, Tr. N. Z. Inst. xv. p. 140, New Zealand.

Daudebardia brevipes (Dr.), Eisenberg, Altenburg, Thuringia ; Ehrmann, Nachr. mal. Ges. 1883, and Mal. Bl. (2) vi. p. 62.

Daudebardia transsylvanica (Bielz) is probably the young state of *D. langi* (Pfr.) ; Böttger, Verh. siebenb. Ver. xxxiii. pp. 3–5.

Daudebardia bœttgeri, sp. n., Clessin, Mal. Bl. (2) vi. p. 38, pl. ii. figs. 9 & 10 (radula, pl. ii. fig. 10), Crimea.

Daudebardia saulcii (Bourg.), Beirut and Haiffa ; *D. gaillardoti* (Bourg.) is probably the younger state of the same : Böttger, Ber. offenb. Ver. xxii. pp. 162 & 163.

Glandina guadeloupensis (Pfr.), with a new variety ; Mazé, J. de Conch. xxxi. p. 9, pl. i. figs. 3 & 4, Guadeloupe.

Leptinaria (Beck) belongs perhaps to the *Testacellidæ*, and *Lamellaxis* (Strebel) is scarcely different from it ; H. Dohrn. JB. mal. Ges. x. p. 354.

Ennea (H. & A. Ad.), s. str., = *Huttonella* (Pfr.) ; *E. raffrayi*, sp. n., Anderta, Abyssinia ; *E. denticulata* (Morel.) comprises as varieties *papillifera* and *hildebrandti* (Jickeli) and a new var. *hamacenica* : Bourguignat, Mal. Abyss. pp. 75–78, the first pl. x. figs. 88–91.

Ennea sulcifera, sp. n., Morelet, J. de Conch. xxxi. p. 401, pl. x. fig. 6, Landana, mouth of Congo.

Ennea spreta, *sesamum*, *dentiens*, and *microdina*, spp. nn., Comore Islands ; *E. anodon* (Pfr.) dark variety and *E. pusilla* (Morelet) not sufficiently distinct from *mariei* : Morelet, J. de Conch. xxxi. pp. 197–199, pl. viii. figs. 2–6.

Ennea microstoma (Möllend., 1881, as *Pupa*) and *splendens* (Möllend.), Southern China, figured ; *Pupa strophiodes* (Gredl.), also belongs to *Ennea* ; a species from Japan indicated : Möllendorff, JB. mal. Ges. x. pp. 277–279, pl. x. figs. 10 & 11.

Ennea kermorganti, sp. n., Ancey, Le Nat. 1881, p. 373, China.

Raffraya, g. n. Shell hyaline, vertically ribbed, obtuse at the summit, aperture 2- or 3-toothed, outer edge of it thickened. *R. filicosta* (Morelet, as *Carychium*), Angola, and *milne-edwardsi*, sp. n., Abuna Yusef, Abyssinia. Bourguignat, Mal. Abyss. pp. 66–69, the latter pl. x. figs. 84–87.

Streptaxis lemyrii, sp. n., and *pellucens* (Pfr.), new variety ; Morlet, J. de Conch. xxxi. pp. 104 & 105, pl. iv. figs. 1 & 2, Cambodia.

Streptaxis sinensis (Gould), several varieties in size, including *erythrocerus* (Möllend.) ; *S. costulatus* (Möllend.), both in Southern China, and *bidens*, sp. n., Hainan Island : Möllendorff, JB. mal. Ges. x. pp. 272–276, pl. x. figs. 7–9, the last also Nachr. mal. Ges. 1883, p. 67.

Rhytida patula and *citrina*, New Zealand, and *australis*, Stewart Island, spp. nn., Hutton, Tr. N. Z. Inst. xv. pp. 138 & 139.

Oxygnatha.

H. H. Godwin-Austen considers the genera with strongly-developed mantle-lobes and rudimentary shell as more advanced in development than those with a well-developed shell ; Land and Freshw. Moll. of India, iv. p. 157.

Limax. Preliminary note on the distinction of the species of *Limax* found in Germany ; H. Simroth, Ber. Ges. Leipz. 1883.

Limax transilvanicus (Heynemann, 1863) = *schwabi* (Frauenfeld, 1864), in Northern Hungary : variations in colour and anatomical description ; Hazay, Mal. Bl. (2) vi. pp. 100–109, pls. v. & vi.

Limax agrestis var. n. *nigra* ; Butterell, J. of Conch. iv. pp. 27 & 65, Beverley.

Limax gyratus, sp. n., with var. *bergensis* ; Westerlund, Nachr. mal. Ges. 1883, p. 167, Ronneby, Sweden, and Bergen, Norway.

Limax dymiczewiczi (Kaleniczenko) from the Crimea ; radula described by Clessin, Mal. Bl. (2) vi. p. 40, pl. ii. fig. 8.

Limax eustrictus (Bourg.) and *berytensis* (Bourg.). Notes by Böttger, Ber. offenb. Ver. xxii. pp. 163–165.

Limax (*Heynemannia*) *conemenosi* (Böttg.). Additions to its description ; Böttger, JB. mal. Ges. x. p. 332.

Paralimax, subg. n. of *Limax*. Respiratory orifice before the middle of the shield. *L.* (*P.*) *intermittens*, sp. n., *id. l. c.* p. 145, Swanetia and near Kutais.

Amalia hessii (Böttg.). Addition to its description ; *id. l. c.* p. 321.

Amalia kalenzkoi, sp. n., Clessin, Mal. Bl. (2) vi. p. 39, pl. ii. fig. 11, Crimea.

Gigantomilax, subg. n. of *Amalia*. Shield not notched behind, nor provided with a circular furrow. *A.* (*G.*) *lederi*, sp. n., 59 millim. long, Böttger, JB. mal. Ges. x. p. 143, pl. iv. fig. 1, Swanetia, Transcaucasia.

Urocyclus comorensis (Fischer) ; Morelet, J. de Conch. xxxi. p. 190, pl. viii. fig. 1.

Urocyclus sp. from Nossi-Bé ; Fischer, J. de Conch. xxxi. p. 54.

Elisa, g. n. External form like that of *Limax*, but an open slit on each side of the hinder end of the body ; an internal shell, with nearly median nucleus ; jaw smooth, with median projection ; radula as in *Helix*. *E. bella*, sp. n., Madagascar, Heynemann, JB. mal. Ges. x. pp. 47–50, pl. ii., & pp. 289–312, pl. xi.

Vega, g. n. Limaciform, keeled and provided with a mucous pore behind ; shield reticulated, free before, on the right side bilobed. [Jaw and radula not described.] *V. nordenskiældi*, sp. n., Ceylon, Westerlund, Nachr. mal. Ges. 1883, p. 164.

Aspidelus, g. n. "Corpus limaciforme, postice attenuatum, compressum, dorso carinatum, foraminatum, fovea mucipara terminali præditum. Clypeus mediocris, gibbus, marginibus breviter liberis. Cavitas pulmonaria ad marginem medianum clypei. Testa externa, mytiliformis, superne convexa, subtus concava, tenuissima, non spiralis, postice in

oleum cucullatum clypeo adhærentem desinens." *A. chaperi*, sp. n., Morelet, J. de Conch. xxxi. p. 395, pl. x. fig. 1, Assinie, Guinea.

Viquesnelia atlantica (Morel.) from the Azores, anatomically described by Arruda Furtado, J. Sci. Lisb. viii. [1882] pp. 305–309, with a plate; jaw smooth, without median projection; teeth of the radula elongated, slender, median smaller, lateral somewhat blunt, bifid, marginals with one long prominent pointed cusp [mentioned in the preceding volume of Zool. Rec., but now seen by the Recorder].

Parmacella olivieri (Cuv.). Anatomical description by H. Simroth. There are two albuminous glands, but no sagitta, which is represented by two permanent muscular bags, having the function of two irritatory organs, and the male organ is roughened. The author thinks that this genus may be the most highly developed among the *Pulmonata*. JB. mal. Ges. x. pp. 1–47, pl. i.

Vitrina pellucida (Müll.) var. n. *brunnensis*, 7 millim. large, from Brünn; Ulicny, Mal. Bl. (2) vi. pp. 200–203.

Vitrina kotulæ, sp. n., Westerlund, JB. mal. Ges. x. p. 54, Tatra, Carpathian Mountains.

Vitrina exilis (Morel.) from Alaska, distinct from *pellucida* (Müll.); Krause, SB. nat. Fr. 1883, p. 36.

Vitrina nivalis (Charp.) = *alpestris* (Clessin), Little St. Bernard and Mont Cenis; Böttger, Ber. offenb. Ver. xxii. p. 159.

Vitrina annularis (Stud.) from the Crimea; Clessin, Mal. Bl. (2) vi. p. 41, pl. iii. fig. 8, radula fig. 9.

Vitrina milne-edwardsiana, *raffrayi*, and *herbini*, spp. nn., Bourguignat, Mal. Abyss. pp. 18–23, pl. vii. figs. 1–3 & 7–9, Hamacen and Abuna-Yusef, Abyssinia.

Vitrina amæna, sp. n., Morelet, J. de Conch. xxxi. p. 397, pl. x. fig. 2, Angola.

Vitrinozonites (Binney, 1879) *latissimus* (Lewis). Living animal and radula; Binney, Bull. Mus. C. Z. xi. p. 154, pl. iii. fig. *a*, genitalia fig. *b*, radula pl. i. fig. *h*.

Helicarion imperator (Gould) var. n. *imperatrix*; Westerlund, Nachr. mal. Ges. 1883, p. 49, Hongkong.

Helicarion bœttgeri, sp. n., Hilber, SB. Ak. Wien, lxxxviii. Abth. 1, p. 1355, pl. iv. fig. 4, Prov. Se-chuen, China.

Austenia (Nevill), subg. of *Helicarion*. Its characters exposed; shell lobes connected all round the periphery of the mantle zone; an unbroken ridge on the upper surface of the foot; dart-sac always present. *A. plano-spira** (Bens.), *bensoni* (Pfr.) with var. n. *sylhetensis*,* *salia* (Bens.) with var. n. *orata*, Darjiling, *A.? panchetensis*, sp. n., Lower Bengal, *papilla-spira*, sp. n., North Khasi Hills, and ? *globosa* (Godw.-Aust.), the species marked with an asterisk anatomically described; Godwin-Austen, Land and Freshw. Moll. of India, iv. pp. 148–154, pls. xxxvi.–xxxviii.

Africarion, subg. n. of *Helicarion*. Mantle-lobes finely and distinctly papillate, right dorsal lobe small, left very ample; the ridge of foot behind forks into two ridges just beneath the posterior margin of the shell, and this portion of the shell rests in the long triangular depres-

sion between them ; radula near that of *Macrochlamys* ; no dart-sac. *pallens*? (Morelet, as *Helicarion*), from Abyssinia. Godwin-Austen, *l.* pp. 154–156, pl. xlii.

Helicarion helenæ, sp. n., Sydney, belonging to the typical section of this genus, anatomically described by Godwin-Austen, *l. c.* p. 146, pl. xli. Both right and left dorsal lobes very ample ; foot not sharply keeled ; no dart-sac.

Helicarion præcellens, sp. n., and *nucleatus* (Stoliczka) ; Martens, Conchol. Mitth. ii. p. 132, pl xxv. figs. 1–7, Salanga Island.

Helixarion [*Helicarion*] *raffrayi*, sp. n., Bourguignat, Mal. Abyss. p. 9, pl. vii. figs. 12–14, Mount Zebul, Abyssinia.

Stenopus? *Helix comorensis* (Morelet). Animal described ; Morelet, J. de Conch. xxxi. p. 205, pl. viij. fig. 12.

Durgella (Blanf.). Generical description, dentition near that of *Sitala*. *D. levicula* (Bens.), type, *minuta* (Godw.-Aust., 1876, as *Helicarion*) and *khasiaca*, sp. n., West Khasi Hills, the two latter anatomically described ; Godwin-Austen, *l. c.* pp. 142–145, pl. xxxix.

Microcystis schmackeriana, *sculpta*, and *glaberrima*, spp. nn., Southern China, with notes on other Chinese species which may belong to this genus, e.g., *rejecta* (Pfr.) = *mamillaris* (Heude); v. Möllendorff, JB. mal. Ges. x. pp. 363–366, pl. xii. figs. 7 & 8; the new species also in Nachr. mal. Ges. 1883, pp. 99 & 100.

Nanina (*Microcystis*) *orbiculum* [*-us*] and *bruijni*, spp. nn., Southern New Guinea, Tapparone-Canefri, Ann. Mus. Genov. xix. pp. 204–206, pl. v. figs. 13–18 ; anatomical sketches of the former, pl. vii. fig. 7.

Nanina citrina (L.), genital organs, *aulica* (Pfr.), varieties, *campylonota*, sp. n., Kei Islands, near New Guinea, and *doriæ* (Tapp.-Can., 1880), Western part of New Guinea ; *id. l. c.* pp. 196–202, pls. v. figs. 11, & viii. fig. 2.

Nanina salangana, sp. n., Martens, Conchol. Mitth. ii. pp. 13[illegible]d, nor pl. xxv. figs. 8–12, Salanga Island. [illegible]n. long,

Nanina egbertæ, sp. n., *id.* JB. mal. Ges. x. p. 81, Tabari, [illegible] Trans-Guinea.

Nanina ribbei, sp. n., Dohrn, JB. mal. Ges. x. p. 344, Maros, C[illegible] p. 190,

Nanina (*Xesta*) *sibylla*, sp. n., Tapparone-Canefri, Ann. Mus. xx. p. 172, pl. i. figs. 2 & 3, genital organs fig. 9, Kandari, I[illegible] lit on Celebes.

Nanina eastlakeana, sp. n., Möllendorff, Nachr. mal. Ges. 1883, [illegible]early and JB. mal. Ges. x. p. 372, pl. xii. fig. 2, Prov. Fuchen, China. [illegible]s in

Macrochlamys (Bens., 1832). Godwin-Austen discusses the so[illegible] s. x. complex literary history of this genus, the typical species being t[illegible] as that of *Nanina* (Gray, 1834), and treats of the following [illegible]pore species :— [illegible]aw

1. Globosely conoid, of small size, sculpture smooth: *M. longicauda*, [illegible]d, Cherra Pongee, N. Khasi and N. Cachar Hills, *nengloensis*,* Naga Hills, *koliaensis*, Assam, *roberti*, Naga Hills, *dorani*, N. Kha[illegible] *tanirensis*, Tanir Peak, 4400 feet, Dafla Hills, *rusticula*, N. Khasi, all spp. nn., *planiuscula* (Hutt.), *darjilingensis* (Nevill, MS.), and *molecula* (Bens.).

2. Globosely conoid, sculpture fine, longitudinally striate: *M. umbraticola*, sp. n., N. Cachar Hills, *perpaula* (Bens.), *kandiensis* (Nevill, MS.), Ceylon, *pongee* (Theob.), *pacata* and *enata*, Naga Hills, *faceta* and *sata*, Dafla Hills, *originaria*, Munipur, and ? *anonæ*, Calcutta, spp. nn.

3. Shell of large size, globose or depressedly globose, sculpture longitudinal, linear, rather wavy striation, with smooth ribbon-like intervals: *M. indica** (Bens.), type of genus, *petrosa* (Hutt.), *splendens* (Hutt.), *shengorensis*, sp. n., Shengor Peak, Dafla Hills, and ? *chænix* (Bens.).

4. Shell of same form as in the preceding, sculpture longitudinal, each fine rib broken up into papillate dots: *M. exul* (Theob.) = *andamanensis* (Tryon), *prona* (Nevill).

5. Shell of similar form, sculpture very fine, regular and delicate longitudinal striation: *M. hardwickii*,* Calcutta, with several varieties, *lhotaensis*, Lhota-Naga Hills, *opiparus* [*-ra*], Darjiling, and *kala*,* Western Bhutan, all spp. nn.

6. Shell depressedly conoid, of large or moderate size, perfectly smooth: *M. resplendens* (Phil.), ? *consepta* (Bens.), *jainiana*,* sp. n., Manbhum and Parisnath, ? *politissima* (Pfr.), *atricolor** (Godw.-Aust.), *cacharica*,* sp. n., Munipur Hills, *lubrica* (Bens.), *koliaensis*,* sp. n., Kolinghur, Assam [this name already used for another species in the first group.]

7. Sculpture regular, longitudinal coarse striæ, broadly ridged; radula with straight unicuspid laterals: *M. castaneo-labiata*,* sp. n., Assam.

8. Shell rather large, globose or depressedly conoid, sculpture decussate or papillate, longitudinal striæ, crossing fine transverse ribbing: *M. dalingensis*,* sp. n., Western Bhutan.

* species marked with an asterisk anatomically described, all figured.

and Freshw. Moll. of India, iii. & iv. pp. 76–122, pls. xiv., xvii.–xxix., & xl.

crochlamys superlita (Morelet, as *Helix*), *M.* ? *cincta* (Möllend.), and *dissima*, sp. n., all from China, with anatomical description of the two ner by Jickeli; O. v. Möllendorff, JB. mal. Ges. x. pp. 358–368 (*M. cta* figured, pl. xii. fig. 1), the last also in Nachr. mal. Ges. 1883, 98.

riophanta (Desmoul.). Generic description, the species of British dia enumerated, anatomical description and figures of *A. lævipes* (Müll.), *rupta* (Bens.), *immerita* (Blanf.), ? *retrorsa* (Gould), *intumescens* Blanf.), and *laidlayana* (Bens.); Godwin-Austen, Land and Freshw. Zool. of India, iv. pp. 132–142, pls. xxxiii. & xxxiv. The species from Malayan Archipelago, referred to this genus by Semper, probably not belong to it.

Oxytes (Pfr.). Generic description, the species of British India enumerated, anatomical description, and figures of *O. cycloplax* (Bens.) and *orobia* (Bens.); *id. l.c.* pp. 123–131, pls. xxx.–xxxii.

Thapsia euriomphala [*euryomph-*], sp. n., Bourguignat, Mal. Abyss. p. 13, pl. vii. figs. 17–20, Mount Zebul, Abyssinia.

Trochomorpha sculpticarina, sp. n., Martens, Conchol. Mitth. ii. p. 13, [illegible] pl. xxv. figs. 13–16, Salanga Island.

Sitala balliana (Nevill, MS.), Madras, *uvida*, *placita*, *subnana*, ? *crenu* [illegible] *cincta*, *intonsa*, *recondita*, Khasi Hills, spp. nn., Godwin-Austen, Land and [illegible] Freshw. Moll. of India, iii. pp. 74–76, pls. xiii. figs. 1–6, & xiv. figs. 3 & 6, and iv. p. 145, pl. xxxviii. fig. 4 (radula).

Sitala trochulus and *turrita*, spp. nn., v. Möllendorff, Nachr. mal. Ges. 1883, p. 101, and JB. mal. Ges. x. pp. 369–371, Southern China.

Sitala raffrayi, sp. n., Bourguignat, Mal. Abyss. p. 14, pl. vii. figs. 15 & 16, Mount Zebul, Abyssinia.

Kaliella lailangcotensis, *kezamahensis*, *burrailensis*, and *rugat*, Naga Hills, *nevilli*, Darjiling, *leithiana*, Ceylon, *dikrangensis*, Assam, *nongsteinensis* and *tirutana*, North Khasi Hills, and *chenelli*, Naga Hills, all spp. nn., and *conula* (Blanf.), Cachar Hills. Radula only of the first two known, the systematic position of the others being, therefore, somewhat doubtful; Godwin-Austen, *op. cit.* iii. pp. 68–73, pls. xv. & xvi. figs. 1–6. Radula of *K. kezamahensis*; id. *op. cit.* iv. p. 146, pl. xxxv. fig. 3.

Kaliella rupicola and *depressa*, spp. nn., v. Möllendorff, Nachr. mal. Ges. 1883, p. 100, and JB. mal. Ges. x. pp. 367–369, pl. xii. figs. 5 & 6, Southern China.

Thalassia propinqua, sp. n., Hutton, Tr. N. Z. Inst. xv. p. 137, Wel[illegible] Pass, New Zealand.

Macrocyclis hemphilli, sp. n., Binney, Bull. Mus. C. Z. xi. p. 137, pl. [illegible] fig. *m*, Oregon.

Zonites verticillus var. n. *corcyrensis*; Böttger, JB. mal. Ges. x. p. [illegible] Corfu.

Hyalinia (*Retinella*) *swanetica*, *sucinacia*, spp. nn., *kutaisiana* (Mo[illegible] var. n. *transitans*, *reticulata*, new name for *mingrelica* (Böttg., *nec* M[illegible] & and *mingrelica* (Mouss.) = *pontica* (Böttg.), all from Transcaucasia; analytical table of all known Transcaucasian species; *id. l. c.* pp. 148 [illegible] pl. v. figs. 2–4.

Hyalinia (*Retinella*) *simoni*, sp. n., *id.* Ber. offenb. Ver. xxii. p. 165, pl. i. fig. 1, Baalbek.

Hyalinia cellaria (Müll.), new variety, *lucida* (Drap.) var. *isseliana* (Paulucci) and var. *blauneri* (Shuttl.), *H. pauluccia* and *guidonii*, spp. nn., Apuan Mountains; Stefani, Bull. Soc. mal. Ital. ix. pp. 25–35.

Hyalinia westerlundi (Cafici, MS.); Westerlund, JB. mal. Ges. x. p. 51, Sicily. *H. alliaria* (Miller), var. n. *cantabrica*, Bilbao, *glabra* (Stud.) var. n. *hungarica*, Hungary, *perspectiva* (Blanc.) var. n. *parma*, Otranto, *nitens* (Mich.) var. n. *resmanni*, Carinthia, *icterica* (Tiberi) var. n. *parthenopæa*, Naples, *allerii* (Paul.) var. n. *hemispherica*, Sicily, *incerta* (Drap.) var. n. *vafra*, Bayonne; *id. l. c.* pp. 55 & 56.

Hyalinia olearis, sp. n., Westerlund, Nachr. mal. Ges. 1883, p. [illegible] Sweden and Denmark.

Hyalina oscari, sp. n., = *natolica*, Bielz (*nec* Albers); Kimakowicz, Verh. siebenb. Ver. xxxiii. p. 9, Transylvania.

Hyalina calpica and *dauthezi*, spp. nn., Kobelt, J. of Conch. iv. pp. 3 [illegible] & 4, Gibraltar.

Hyalinia diaphanella (Kryn.) = *taurica* (Clessin), *planaria* and *kry-*

nu
M*ekii*, spp. nn., Clessin, Mal. Bl. (2) vi. pp. 41–43, pls. ii. fig. 12, & iii. gs. 3 & 4, Crimea.

Hyalinia (*Polita*) *nitelina* (Bourg.), Haiffa and Tyre, *æquata* (Mouss.) is probably a variety of it; both often exhibit lamellar knoblets on the aperture in the young state; *H.* (*P.*) *camelina* (Bourg.) = *frondosula* (Mouss.), var. n. *depressa*, Brumana, in Syria: Böttger, Ber. offenb. Ver. xxii. pp. 166 & 167.

[*Hyalina*] *Zonites nitidus* (Müll.) and *excavatus* (Bean). Darts described by C. Ashford, J. of Conch. iv. pp. 108–110, pl. iii. figs. 1–10.

Hyalinia (*Euhyalinia*) *arctispira*, *obtusa*, and (*Vitrea*) *minura*, spp. nn., Westerlund, Nachr. mal. Ges. 1883, pp. 49 & 50.

Hyalina electrina (Gould) from Alaska and Minnesota; Reinhardt, SB. nat. Fr. 1883, p. 40.

Hyalina subrupicola, sp. n., Binney, Bull. Mus. C. Z. xi. p. 140, cave in Utah.

Hyalina aruensis, sp. n., Tapparone-Canefri, Ann. Mus. Genov. xix. p. 963, pl. ii. figs. 8–10, Aru Islands.

Hyalinia (*Conulus*) *fulva* of authors is not O. F. Müller's *Helix fulva*; Westerlund, Nachr. mal. Ges. 1883, p. 173. [Long ago stated by other conchologists, and therefore written *fulva* (Drap.) by the Recorder in pls. bers's "Heliceen," 1860, and Kobelt's "Catalogue," 1881.—Rec.]

Hyalinia (*Conulus*) *bourguignati*, sp. n., Stefani, Bull. Soc. mal. Ital. ix. p. 40, Apuan Mountains.

Conulus divided into the following subgenera (O. Reinhardt, SB. nat. Fr. 1883, pp. 85 & 86):—

Discoconulus, n. Depressed, without keel, with many whorls. *C. sinapidium* (Reinh.), *gundlachi* (Pfr.), &c.

Euconulus, n. Globular-conical, without distinct keel. *C. fulvus* (Drap.), &c.

Trochoconulus, n. Trochiform, keeled. *C. labilis* (Gould), *semenlini* (Moric.), &c.

Hyalina (*Conulus*) *praticola*, sp. n., Northern Germany, *ula* (Gould), Peninsula of the Chukchi, *chersina* (Say), Eastern North America, *stearnsi* (Bland), Alaska and Oregon, and *trochulus*, sp. n., Texas, all nearly allied to, but distinct from *fulva* (Drap.); Reinhardt, SB. nat. Fr. 1883, pp. 40–42.

Conulus amplus, *obtusangulus* and *circumcinctus*, spp. nn., a[illegible] from Japan, and notes on other Japanese species; O. Reinhardt, SB. na[illegible]r. 1883, pp. 83–85.

Zonites udvaricus (Servain) is a young *Hyalina cellaria* (Müll.); Hazay, Mal. Bl. (2) vi. p. 188.

Zonites upsoni (Calkins, 1880) is probably the young state of *Vertigo ovata* (Say); Binney, Bull. Mus. C. Z. xi. pp. 149 & 150.

Zonites wheatleyi and *petrophilus*, spp. nn., Bland, Ann. N. York Ac. ii. Moll. c[illegible] pp. 368 & 369, woodcuts; the latter also in Bull. Mus. C. Z. xi. p. 144, the [illegible] pl. i. fig. *f*, Tennessee.

Zonites lawi, sp. n., Tennessee and North Carolina, Binney, Bull. Mus. C. Z. xi. p. 142, pl. ii. fig. *e*; and new figures of some other North American species, figs. *a–g*.

Zonites ? helmsi, New Zealand, and *Z. ? fulminata*, Stewart Island, spp. nn., Hutton, Tr. N. Z. Inst. xv. pp. 137 & 138.

Leucochora cariosula (Mich.) var. n. *vetula*, Oran, and *fimbriata* (Bourg.) var. n. *myopa*, Palestine; Westerlund, JB. mal. Ges. x. p. 57.

Aulacognatha.

Arion ater var. n. *albo-lateralis*, Carnarvonshire, and *albida*, Westmoreland, Roebuck, J. of Conch. iv. pp. 39 & 40.

Arion. Preliminary note concerning the specific distinctness of *A. hortensis* and *subfuscus* from *empiricorum* (Fér.); H. Simroth, Ber. Ges. Leipz. 1883.

Hemphillia. Emended generic description; Binney, Bull. Mus. C. Z. xi. p. 130, pl. iii. fig. *h*.

Helix (*Patula*) *lepta*, sp. n., Nagasaki, and *ruderata* var. n. *ojolensis*, Bering Island, Westerlund, Nachr. mal. Ges. 1883, p. 50. *H.* (*P.*) *monkheiti* (Newc.), from Alaska, distinct from *striatella* (Anthony); Krause, SB. nat. Fr. 1883, p. 35.

Patula bryanti, sp. n., Harper, J. Cincinn. Soc. iv. p. 258, North America.

Patula de-mani, sp. n., Tapparone-Canefri, Ann. Mus. Genov. xix. p. [illegible] Aru Islands.

Patula tapirina, sp. n., = *coma* (Hutt., *nec* Gray); Hutton, Tr. N. Z. Inst. xv. p. 134, New Zealand.

Microphysa ? pumila, sp. n., *id. l. c.* p. 134, New Zealand.

Gerontia, g. n. Distinct from *Patula* by a mucous gland on the tail; jaw smooth, striated. *G. pantherina*, sp. n., New Zealand. *Id. l. c.* p. 135.

Amphidoxa cornea and *costulata*, id. *l. c.* p. 136, Auckland, New Zealand.

Strobila leiodus, sp. n., *id. l. c.* p. 135, New Zealand.

Helicodiscus fimbriatus (Wetherby), Eastern Tennessee, first figured; Binney, Bull. Mus. C. Z. xi. pl. i. fig. *d*.

[*Caracollina*] *Helix lens* var. *elia*, Böttger, JB. mal. Ges. x. p. 330, Elis, in Greece. *H. cisternasi*, sp. n., Hidalgo, J. de Conch. xxxi. p. 56, pl. ii. fig. 4, Islands of S. Eulalia, near Iviza.

[*Vallonia*] *Helix tenuilabris* (Braun) in recent alluvial deposits of the River Jagst at Schönthal, in Württemberg, of larger size than usual; Weinland, JH. Ver. Württ. 1883, p. 117.

Vallonia gracilicosta, sp. n., Little Missouri, and *asiatica* (Nevill, as variety), from Alaska; Reinhardt, SB. nat. Fr. 1883, pp. 42 & 43.

[*Fruticicola*] *Helix strigella*. Note on its variation; Hazay, Mal. Bl. (2) vi. p. 188.

Helix hirci, sp. n., near *H. strigella*, Croatia, Clessin, Mal. Bl. (2) vi. p. 198.

Helix (*Eulota*) *evages*, sp. n., Böttger, JB. mal. Ges. x. p. 161, pls. iv. fig. 2, & vi. fig. 1, Psirsk, near Sukum, Transcaucasia; sculpture as in *Nummulina*.

Helix sericea var. n. *carinata*; Taylor, J. of Conch. iv. p. 31, Ilkley, Yorkshire.

Helix granulata, Ald.? Recent alluvial deposits of the Jagst; Weinland, JH. Ver. Württ. 1883, p. 117.

Helix cantiana (Mont.), Italian varieties, *carfaniensis*, sp. n., and *cremenelea* (Risso) var. n. *isseli*, Apuan Mountains; Stefani, Bull. Soc. mal. Ital. ix. pp. 49–59. *H. cantiana* (Mont.) var. n. *langii*, Haiffa, in Syria; Böttger, Ber. offenb. Ver. xxii. p. 168, pl. i. fig. 2.

Helix (*Carthusiana*) *globula* var. *nana*, and *flaveola* (Kryn.) varr.; Böttger, JB. mal. Ges. x. pp. 157–159.

Helix (*Fruticola*) *freytagi*, sp. n., v. Maltzan, Nachr. mal. Ges. 1883, p. 106, Crete.

Helix (*Nummulina*) *prometheus*, sp. n., Böttger, JB. mal. Ges. x. p. 159, pl. iv. fig. 6, Rion, Transcaucasia.

Helix (*Xerophila*) *piratarum*, Oran, (*Jacosta*) *moraguesi*, Mallorca, (*Helicella*) *heynemanni*, Tetuan, and (*Candidula*) *ordunensis*, Orduna, Biscay, spp. nn., Kobelt, Nachr. mal. Ges. 1883, pp. 113–115. The two former, and *mauritanica* (Bourg.), *lemoinii* (Debeaux), *sigensis* (Kobelt), all from Oran, *hydruntina* (Blanc), Otranto, *cauta* (Westerl.), Attica, *vukotinovici* (Hirc), Croatia, *dautezi*, sp. n., Algesiras, *pisanopsis* (Servain) var. n. *ragusæ*, Western Sicily, *nyelii* (Mittre), Minorca, and some others already figured in other works; Kobelt, Iconogr. (2) i. pp. 41–54, pls. xvi.–xix.

Helix (*Xerophila*) *benoiti* and *præclara* (Cafici, MS.), spp. nn., and *moesta* (Parr.) var. n. *luctuosa*; Westerlund, JB. mal. Ges. x. pp. 52 & 53, all from Sicily. *H.* (*X.*) *phthiota*, Phthiotis, Greece, *pastorella*, Eubœa and Prevesa, *liburnica* (Stossich, MS.), Pentone, *samnitum*, Cerreto, Italy, and *graia*, Missolunghi, spp. nn.; *id. l. c.* x. pp. 57–60.

Helix virgata (Mont.): dart described by C. Ashford, J. of Conch. iv. p. 111, pl. iii. figs. 11–17. *H. virgata* (Mont.) var. n. *leucozona*, Taylor, *tom. cit.* p. 29, Hayle, Weston-super-Mare and Tenby.

Helix rufo-labris (Benoit). Note by Westerlund, Nachr. mal. Ges. 1883, p. 172.

Helix cyrenaica, sp. n., Martens, SB. nat. Fr. 1883, p. 149, Bengazi.

Helix cespitum (Dr.), *ammonis* (Ad. Schmidt), and *bathyomphala*: their distribution in Italy and synonymy; Stefani, Bull. Soc. mal. Ital. ix. pp. 101–112. *H. unifasciata* (Poiret) var. *vincæ* (Paulucci), Apuan Mountains; *id. l. c.* p. 113.

Helix obvia (Hartm.) from Greece; Böttger, JB. mal. Ges. x. p. 321.

Helix euxina, sp. n., *krynickii* (Andrz.) = *theodosiæ* (Clessin), *filimargo* (Zgl.), *retowskii*, sp. n., and *substriata* (Clessin); Clessin, Mal. Bl. (2) vi. pp. 44–48, pls. ii. figs. 4 & 3, & iii. figs. 1, 12, & 13. Their distribution in the Crimea; Retowsky, *tom. cit.* pp. 7–10.

Helix (*Xeroleuca*) *libyca* (Ponsonby, MS.), *berenice*, sp. n., Coasts of "Libya," and (*Jacosta*) *siphnica*, sp. n., Siphnos Island, all collected by Capt. Spratt; Kobelt, Nach. mal. Ges. 1883, pp. 181–183.

Helix (*Jacosta*) *amphiconus*, *euphacodes*, *sphakiota*, *siderensis*, (*Candidula*) *diensis*, *psiloritana*, and *subvariegata*, spp. nn., Maltzan, Nachr. mal. Ges. 1883, pp. 102–106, all from Crete.

Helix lauraguaisiana, *pauli*, and *philora* (Bourguignat, MS.), *scrupellina* (Fagot, MS.), spp. nn., and distinction of 27 French species belonging to the group of *H. striata* (Drap.); Locard, in his Contributions à la faune malacol. de la France, No. vi. (Ann. Soc. L. Lyon, xxx.).

Helix profuga var. n. *attica*; Böttger, JB. mal. Ges. x. p. 342, Attica.

Helix intersecta (Poir.) from Düppel in Jutland; Friedel, Nachr. mal. Ges. 1883, p. 184.

Helix platenica (Servain) is a young *H. costulata* (Zgl.), and *H. fueredensis* of the same author is a weathered specimen of the same species; Hazay, Mal. Bl. (2) vi. p. 189.

Helix cantabrica (Hidalgo) anatomically described by P. Fagot; it much resembles *H. apicina* (Lam.) in this respect: Bull. Soc. Toulouse, 1880.

Helix trutatiana, sp. n., near *cantabrica* (Hidalgo), and *renei*, sp. n., near *conspurcata* (Dr.); Fagot, Moll. du Pic du Gar (Bull. Soc. Toulouse), 1882, pp. 8 & 9, Pic du Gar, Dép. Haute-Garonne.

Helix molinæ, sp. n., Hidalgo, J. de Conch. xxxi. p. 57, pl. ii. fig. 5, Columbretes Islands, near the Balearic Isles.

Helix (*Xerophila*) *bargesiana* (Bourg.), Palestina and Syria: note by Böttger, Ber. offenb. Ver. xxii. p. 170.

[*Turricula*] *Helix trochoides* (Poiret) with two varieties, *philammia* (Bourg.), *trochlea* (Pfr.), *terrestris* (Chemn.), distinguished from *elegans* (Drap.) and *scitula* (Jan.), and finally *explanata* (Müll.), conchologically and anatomically described and discussed by Alfr. de Saint-Simon [title *suprà*].

Helix (*Turricula*) *simiarum*, sp. n., Kobelt, J. of Conch. iv. p. 8, Gibraltar.

[*Cochlicella*] *Bulimus acutus* var. n. *nigrescens*; Taylor, J. of Conch. iv. p. 32, Isle of Man.

Campylæa schmidti (Rossm.) var. n. *hessii*, from Transylvania; Kimakowicz, Verh. siebenb. Ver. xxxiii. p. 23.

Helix nansoutiana (Bourg., MS.), sp. n., Fagot, Hist. Malac. Hautes Pyr. p. 9, and Bull. Soc. Toulouse, 1880, Barèges; allied to *H. carascalensis*.

Helix cingulata (Stud). Amount of variation in shape and size in one locality (Bozen), the colouration being more constant; Martens, Conchol. Mitth. ii. pp. 152–154, pl. xxx. figs. 1–11.

Helix (*Campylæa*) *brenskii*, sp. n., Böttger, JB. mal. Ges. x. p. 335, Messenia.

Helix plano-spira (Lam.)., specimens from Tuscany, and *cingulata* var. *carrarensis* (Porro), the latter including as subvarieties *montana*, *kobeltiana*, *apuana*, *aguata*, *lucensis*, *affinis* (Paulucci), *appeli* (Kobelt), and *frigidescens* (Del Prete), Apuan Mountains; Stefani, Bull. Soc. Geol. Ital. ix. pp. 60–87.

Helix subzonata var. *distans* (Blanc), Corfu, *nicolai* (Kleciach), Dalmatia, and *plano-spira* (Lam.) varr.; Kobelt, Icongr. (2) i. pp. 36 & 39, pls. xiv. fig. 105, & xv. figs. 111–114.

Helix (*Fruticocampylæa*) *flavo-limbata*, sp. n., Ezeri, in Swanetia, *narzanensis* (Kryn.) varr. nn. *svanetica*, *macromphala*, *cyclothyra*, and

depressa, *H. pratensis* (Pfr.) and *pontica*, sp. n., Caucasus; Böttger, JB. mal. Ges. x. pp. 162–171, pls. v. figs. 3–6, & vi. figs. 2–6.

Helix quimperiana (Fér.). On its occurrence near Brest; Daniel, J. de Conch. xxxi. p. 381.

[*Chilotrema*] *Helix lapicida* var. *nigrescens*, Taylor, J. of Conch. iv. p. 83, Westbury, near Bristol.

[*Arionta*] *Helix æthiops* (Bielz) distinct from *arbustorum* (L.), *H. arbustorum* var. n. *jetschini*, Moravia, var. *alpestris*, *costulata*, Val Tonale, and *H. zatarti* (Farines) var. n. *camprodunica*, Pyrenees; Kobelt, Iconogr. (2) i. pp. 37 & 38, pl. xiv. figs. 106–109. *H. arbustorum* var. *cincta* = *pallida* (Taylor); Taylor, J. of Conch. iv. p. 83: another variety new for England; Scot. Nat. (2) i. p. 57.

[*Tachea*] *Helix nemoralis* (L.) and *hortensis* (Müll.). Notes on the varieties in colour and bands observed near Bremen; F. Borcherding, Abh. Ver. Brem. viii. pp. 286–294.

Helix nemoralis var. *etrusca* (Ziegl.) and var. n. *alphea*, from Pisa; Stefani, Bull. Soc. mal. Ital. ix. pp. 87–91.

Helix hortensis varr. nn. *olivacea* and *lilacina*, British; Taylor, J. of Conch. iv. p. 34.

Helix hortensis var. *fusco-labris* (Kregl.), Schönthal, Württemberg; Weinland, JH. Ver. Württ. 1883, p. 120.

Helix hortensis. A six-banded specimen from Altenburg; Simroth, Mal. Bl. (2) vi. p. 63.

Helix (*Tachea*) *coquandi* var. n. *ellioti*, and (*Macularia*) *lactea* var. n. *alybensis*; Kobelt, J. of Conch. iv. pp. 5 & 6, Gibraltar.

[*Macularia*] *Helix alcyone* (Kobelt, 1882); Kobelt, Iconogr. (2) i. p. 35, pl. xiv. fig. 103, Southern Morocco.

Helix maresi (Crosse) = *tigri* (Gerv.) found alive in the south of the Province Oran; Crosse, J. de Conch. xxxi. p. 97.

Helix (*Levantina*) *mazanderanensis* (Nevill, MS.), sp. n., Kobelt, Iconogr. (2) i. p. 35, pl. xiii. fig. 102, Mazanderan; *H.* (*L.*) *agopinoides*, sp. n., v. Maltzan, Nachr. mal. Ges. 1883, p. 102, Crete.

Helix signata (Fér., Rossm.). Anatomical description compared with that of *H. muralis* (Müll.); M. A. de St. Simon, Bull. Soc. Toulouse, xi. [1877], 8 pp., with a plate.

[*Iberus*] *Helix ragusæ*, sp. n., Kobelt, Iconogr. (2) i. p. 40, pl. xv. fig. 115, Sicily ?.

Helix aimophila [*hæm-*] var. n. *tchihatcheffi*; Kobelt, JB. mal. Ges. x. p. 85, and Iconogr. (2) i. p. 38, pl. xv. fig. 110, Biredschik, on the Euphrates (intermediate between the sections *Tachea* and *Pomatia*).

[*Pomatia*] *Helix aspersa* (Müll.). Its synonymy, development, variation, and anatomy, by J. W. Taylor, J. of Conch. iv. pp. 89–105, pl. iv.

Helix taurica (Kryn.) var. n. *martensi*; Böttger, JB. mal. Ges. x. p. 172, pl. iv. fig. 8, Schirwan, Caucasus.

Helix lucorum, *cincta*, *ligata*, and *pomatia*. Their distribution in Italy; Stefani, Bull. Soc. mal. Ital. ix. pp. 93–98.

Helix (*Pomatia*) *maltzani*, sp. n., Kobelt, JB. mal. Ges. 1883, p. 84, and Iconogr. (2) i. p. 34, pl. xiii. figs. 100 & 101, Maguisi, near Smyrna.

Helix. African species :—

Helix abbadiana, new name for *brocchii* (Jickeli, *nec* Calcara), *combesiana*, new name for *pilifera* (Jickeli, *nec* Martens), *ferretiana*, *herbini*, *galinieriana*, *raffrayi*, *achillii*, *hamacenica*, *subnivellina*, and *lejeuniana*, spp. nn. (the last = *darnaudi* var. of Jickeli), Hamacen and Mount Zebul, Abyssinia ; Bourguignat, Mal. Abyss. pp. 28–42, pls. vii. & viii. figs. 21–46 : they are referred to the groups of *pilifera*, *rupestris*, *aculeata*, *isseli*, and *nivellina*.

Helix jickelii (Nevill, MS.), sp. n., Kobelt, Nachr. mal. Ges. 1883, p. 113, and Iconogr. (2) i. p. 47, pl. xvii. fig. 136, Abyssinia.

Helix homalogyra and *microsoma*, spp. nn., Morelet, J. de Conch. xxxi. pp. 191 & 192, pl. viii. figs. 13 & 14, Mayotte, Comore Islands.

Helix excoriata, sp. n., Martens, JB. mal. Ges. x. p. 82, Madagascar.

Helix. Asiatic species :—

Helix (*Fruticicola*) *sphærulata*, sp. n., Reinhardt, SB. nat. Fr. 1883, p. 86, Japan ; *H.* (*F.*) *eumenes*, sp. n., Westerlund, Nachr. mal. Ges. 1883, p. 51, Japan.

Helix loczyi[*-zii*], *siningfuensis* and *schensiensis*, spp. nn., *bukigneri* (Desh.) = *richthofeni* (Martens) with var. *kalganensis* (Möllddff.), *confucii*, *buddhæ*, *mencii*, spp. nn, Provinces Kansu and Shensi, and (*Fruticocampylæa*) *gredleri*, sp. n., Eastern Thibet ; Hilber, SB. Ak. Wien, lxxxvi. Abth. 1, pp. 324–348, pls. i.–iii.

Helix loczii (Hilber) = *pulveratricula* (Martens), nearly contemporaneous, and *gredleri* (Hilber) = *stoliczkana* (Nevill) ; Hilber, *op. cit.* lxxxviii. Abth. 1, pp. 1351 & 1353. *H. pulveratrix* (Martens), *buliminus*, and *buliminoides* (Heude), figured ; *l. c.* pp. 1352 & 1354, pl. iv. figs. 1–3.

Plectopylis pulvinaris (Gould), *multispira*, sp. n., *fimbriosa* (Martens), and *cutisculpta*, sp. n., all from Southern China ; v. Möllendorff, JB. mal. Ges. x. pp. 375–382, pl. xii. figs. 9–12, the second also Nachr. mal. Bl. 1883, p. 121.

Helix norodomiana, sp. n., Morlet, J. de Conch. xxxi. p. 10, pl. iv. fig. 3, Cambodia.

Helix ? glomerosa, sp. n., Godwin-Austen, Land and Freshw. Moll. of India, iii. p. 73, pl. xiv. fig. 9, Dafla Hills, India (true relationship uncertain).

Helix hæmastoma (L.) covered with a growth of algæ ; Am. Nat. xvii. p. 558 [no author named].

Helix. Species from the Malayan Archipelago and New Guinea :—

Helix leptochila, sp. n., near *expansa* (Pfr.), Moluccan Islands, and *devincta*, new name for *sororcula* (Martens, preoccupied), *H. argillacea* (Fér.) found in Java, *H. zonaria*, varieties discussed, *collis* (Mouss.), a new variety described, *lampas* (Müll.) from Halmahera, and two new varieties of *pyrostoma* (Fér.) from the same island ; Tapparone-Canefri, Ann. Mus. Genov. xx. pp. 148–161, the first pl. i. figs. 14–16.

Helix (*Dorcasia*) *occulta* (Pfr.), Aru Islands, and (*Trochomorphoides*)

bertiniana (Tapp.-Can., 1880), New Guinea, Tapparone-Canefri, *op. cit.* xix. pp. 112 & 113, pl. ii. figs. 18–20 & 24–26.

Helix (*Chloritis*) *cheratomorpha* [*keratom-* on pl.; scribe *ceratom-*], Sorong Island, and *dinodeomorpha*, Fly River, Southern New Guinea, spp. nn., *id. l. c.* pp. 167 & 169, pl. iv. figs. 4–7 & 15–18; jaw, radula, and genital organs of the latter, pls. vii. fig. 5, & viii. figs. 2 & 15.

Helix (*Planispira*) *zonaria* (L.). Occurrence on the Island of Sorong, and anatomical notes; *id. l. c.* pp. 181 & 182, pls. vii. fig. 8, & ix. figs. 1 & 19.

Sulcobasis, subg. n. of *Helix*. Near *Chloritis*, but the spire somewhat elevated. Type, *H. sulcosa* (Pfr.) and *beatricis*, sp. n., Fly River, Southern New Guinea. *Id. l. c.* pp. 161 & 163, pl. iv. fig. 14, radula pl. viii. fig. 16.

Cristigibba, subg. n. of *Helix*. Type, *H. tortilabia* (Less.) and its varieties, also *plagiochila*, *rhodomphala*, and *dominula*, spp. nn., all three from Fly River, Southern New Guinea. *Id. l. c.* pp. 161 & 171–180, pls. iv. figs. 6–13, & v. figs. 4–7; anatomical sketches of *C. plagiochila* and *dominula*, pl. vii. figs. 4 & 6, genital organs, pl. ix. figs. 5 & 14, jaw and radula.

Polygyra [?] *raffrayi* (Tapp.-Can., 1878), New Guinea; *id. l. c.* p. 190, pl. v. figs. 19 & 20.

Helix (*Hadra*) *hixoni* and *broadbenti* (Brazier), New Guinea; *id. l. c.* pp. 187 & 188, pl. v. figs. 20 & 21.

Papuina (Martens). General observations on this subgenus and three subdivisions of it. *H.* (*P.*) *pelecystoma* (Tapp.-Can., 1880), *diomedes* and *yulensis** (Brazier), *katauensis*,* sp. n., *blainvillii* (Guillou) = *gærtneriana* (Pfr.), *canovarii*, sp. n., *exsultans*, new name for *ferussaci* (Pfr., *nec* Férussac), *pythonissa*, *taumantias*,* *ridibunda*,* *meditata*,* *tomaselliniana*,* *gestroi*,* spp. nn., and *brazieræ** (Braz.), all from New Guinea and adjacent islands: anatomical sketches of the species marked by an asterisk, and of *grata* (Michelin) and *novo-guineensis* (Pfr.). *Id. l. c.* pp. 114–155, pls. ii. fig. 3, iv. figs. 1–3, & v. figs. 1–3; anatomical sketches, pls. vi. & vii. figs. 1–3.

Helix (*Papuina*) *walleri*, new name for *brenchleyi* (Angas), preoccupied; Brazier, P. Linn. Soc. N. S. W. viii. p. 228.

Insularia, new subdivision of *Papuina*. Type, *Helix lituus* (Less.). Tapparone-Canefri, Ann. Mus. Genov. xix. pp. 115 & 138. [Corresponding to *Papuina*, as originally circumscribed in the 2nd edition of Albers. —Rec.]

Helix (*Geotrochus*) *tapparonii* and *latiaxis* (Obba), *oxystoma* [name preoccupied in a fossil species: Rec.], and (*Sphærospira*) *gerrardi*, spp. nn., D'Entrecasteaux Island, S.E. New Guinea; E. A. Smith, Ann. N. H. (5) xi. pp. 190–192.

Helix naso and *rehsii*, spp. nn., Martens, J.B. mal. Ges. x. pp. 82 & 83, S.E. New Guinea.

Corasia conformis (Fér.). Jaw, radula, and genital organs; Tapparone-Canefri, Ann. Mus. Genov. xix. pp. 158 & 159, pl. viii. figs. 1, 8, & 15.

Helix. Australian species:—

Helix (*Discus*) *thorpiana*, new name for *ceralis* (Cox), preoccupied; Brazier, P. Linn. Soc. N. S. W. viii. p. 228.

Helix. American species :—

Polygyra harfordiana (Coop.) figured ; Binney, Bull. Mus. C. Z. xi. p. 151, woodcut.

Helix (*Polygyra*) *unguifera*, sp. n., Mousson, J. de Conch. xxxi. p. 216, pl. ix. fig. 1, Mazatlan.

Triodopsis henriettæ (Mazyck) ; Binney, Bull. Mus. C. Z. xi. p. 152, woodcut, Eastern Texas.

Arionta. Systematic and anatomical notes on some North American species ; *id. l. c.* pp. 157–159, pl. i. figs. *f* & *k*.

Helix bracteola (Fér.) = *vortex* (Pfr.). Its occurrence on Guadeloupe ; Mazé, J. de Conch. xxxi. pp. 14 & 43.

Helix [*Dentellaria*]. Colouration of the animal, varieties and occurrence of some species on Guadeloupe ; *id. l. c.* pp. 10–13, 42, 48, & 52.

Bulimus (*Amphidromus*) *beccarii*, sp. n., near *winteri* (Pfr.), Kandari, Celebes ; Tapparone-Canefri, Ann. Mus. Genov. xx. p. 170, pl. i. figs. 10 & 11.

Bulimus cantagallanus (Rang), including *proximus* (Sow.), *accelerans*, and *intercedens* (Martens), in Central Brazil, from Bahia to near Rio ; Dohrn, JB. mal. Ges. x. pp. 347 & 348.

Bulimus willi and *albo-filosus*, spp. nn., Eastern Brazil, and on some variations of *B. bilabiatus* (Sow.) and *pantagruelinus* (Moric) ; *id. l. c.* pp. 348–351, pl. xi. figs. 4–7.

Achatina buchneri (Martens, 1882), Kwilu River, Congo, figured ; Martens, Conchol. Mitth. ii. p. 138, pl. xxvi.

Achatina raffrayi, sp. n., Jousseaume, Le Nat. 1883, p. 324, Abyssinia [probably a *Subulina*.—Rec.].

Calycia crystallina (Rv.) and *isseliana*, sp. n., the latter from the South Coast of New Guinea ; Tapparone-Canefri, Ann. Mus. Genov. xix. pp. 100 & 101, woodcuts.

Pachnodus (Alb.) is considered by Bourguignat as a distinct genus of the "*Achatinidæ*" ; *P. rochebrunianus*, sp. n., Mount Zebul, Abyssinia : Bourguignat, Mal. Abyss. pp. 78 & 79, pl. x. fig. 81.

[*Rhachis*] *Bulimus comorensis* (Morelet) var.; Morelet, J. de Conch. xxxi p. 205, pl. viii. fig. 8.

Bulimus terrulentus, sp. n., *id. l. c.* p. 398, pl. x. fig. 3, Ogowé, Gaboon.

Bulimus macleayi (Brazier) ; Tapparone-Canefri, Ann. Mus. Genov. xix. p. 104, pl. ii. figs. 16 & 17, Yule Island, New Guinea.

Buliminus (*Petræus*) *sidoniensis* (Charp.), brown coloured in the recent state, from many localities in Syria ; Böttger, Ber. offenb. Ver. xxii. p. 171.

[*Buliminus*] *Bulimus raffrayi*, *herbini*, *simonis*, *achillii*, *tamiserianus*, *abbadianus*, *galinieranus*, *lejeanianus*, spp. nn., *æthiopicus* = *fallax*, figured by Jickeli, and *sennaaricus* = *Pupa sennaarensis* (Pfr.) = *B. cerealis* (Paladilhe), Anderta and Hamacen, *subeminulus* and *macroconus*, spp. nn., forming a distinct group, Bogos ; Bourguignat, Mal. Abyss. pp. 46–65, pls. ix. & x. figs. 60–63 & 70–80. *B. lamprodermum* (Morelet) is from Mount Meraya, Somali-land ; *id. l. c.* p. 43.

Medea, subg. n. of *Buliminus*. Intermediate between *Ena* and *Petræus*,

with spiral sculpture. Types, *B. raddii* (Kobelt) and *carduchus* (Martens). Böttger, JB. mal. Ges. x. p. 174.

Buliminus (*Ena*) *bœttgeri*, sp. n., = *tener* of later authors, *nec* Rossm., Transcaucasia; Clessin, Mal. Bl. (2) vi. p. 49, pl. ii. fig. 15; also Böttger, JB. mal. Ges. x. p. 176.

Buliminus (*Napæus*) *neumayri*, *pantoensis*, and *gredleri*, spp. nn., Eastern Tibet, *loczyi*, sp. n., Prov. Kiang-su, *setschuenensis* and *mœllendorffi*, spp. nn., Prov. Se-chuen; *B. heudeanus* (Ancey), *giraudelianus* (Heude), *baudoni* (Desh.), from Eastern Tibet, and *obesus* (Heude), Prov. Kiang-su, also described and figured; Hilber, SB. Ak. Wien, lxxxviii. Abth. 1, pp. 1356–1364, pls. iv. figs. 5–12, & v. figs. 1–7.

Buliminus (*Napæus*) *cadaver*, *pumilio*, and *heudeanus*, new names for *pallens*, *minutus*, and *thibetanus* (Heude), all preoccupied; Ancey, Nat. Sicil. 1883, p. 17.

[*Zebrina*] *Buliminus cylindricus* (Menke), including as varieties *fusiformis* (Menke), *obsoletus* (Parr.), *acuminatus* (n.), *bettai* (Charp.), *fusicilabris* and *turgidus* (Kryn.), *zebriolatus* (Clessin), and *illibatus* (Ziegl.); *B. gibber* (Kryn.), including *candelaris* (Pfr.) [?], *phorcus* (Bourg.), and *chersonesicus* (Reeve); *B. bidens* (Kryn.), with var. *theodosianus* (Bourg.) *retowskianus* (Clessin) and var. *costatus* (n.), all from the Crimea: Retowski, Mal. Bl. (2) vi. pp. 13–21, and Clessin, *tom. cit.* pp. 37, 48 & 49, pl. iii. figs. 3, 5, 6, & 7. *B. bœttgeri*, sp. n., Clessin, *l. c.* p. 49, pl. ii. fig. 15, Caucasus.

Buliminus (*Zebrina*) *dalailamæ*, *batangensis*, spp. nn., Eastern Tibet, and *szechenii* (Böttger, MS.), sp. n., Prov. Se-chuen, Hilber, SB. Ak. Wien, lxxxviii. Abth. 1, pp. 1364–1367, pl. v. figs. 8–10.

Buliminus (*Zebrina* ? or subg. n. ?) *belæ* and *anceyi*, spp. nn., widely umbilicated, the former with two columellar folds, Eastern Tibet; *id. l. c.* pp. 1367–1369, pl. v. figs. 11–13.

Buliminus (subgen. ?) *kreitneri*, sp. n., allied to *dissimilis* (Martens), Prov. Se-chuen, China, *id. l. c.* p. 1371, pl. vi. fig. 3.

Mastus transylvanicus, sp. n., = *Bulimus reversalis* var. *relicta*, var. *curta*, var. *parva*, and var. *tenuis* (Bielz), also *M. venerabilis* (Pfr.) distinguished from *reversalis* (Bielz); Kimakowicz, Verh. siebenb. Ver. xxxiii. pp. 30 & 29, Transylvania.

Buliminus (*Chondrula*) *euxinus*, *incertus*, *diodon*, and *clessini*, spp. nn., Retowski, Mal. Bl. (2) vi. pp. 54–56, the two latter, pl. ii. figs. 1 & 2, the first, fig. 13, probably Transcaucasian, found on the beach in the Crimea.

Buliminus (*Chondrula*) *lederi*, sp. n., Böttger, JB. mal. Ges. x. p. 177, pl. vii. fig. 1, Swanetia.

Buliminus (*Chondrula*) *tridens* (Müll., var. n. *langii*, 15–20 mm. long, Haiffa, in Syria; *id.* Ber. offenb. Ver. xx. p. 172, pl. i. fig. 3.

Buliminus (*Chondrula*) *sichoensis* and *q. angjuoensis* [from Kwang-yuen-shien], spp. nn., Prov. Hu-peh and Se-chuen, China, Hilber, SB. Ak. Wien, lxxxviii. Abth. 1, p. 1370, pl. vi. figs. 1 & 2.

Achatinelloides (Nevill, 1878) = *Ovella* (Clessin, 1879); Martens, Conchol. Mitth. ii. p. 145.

Passamaiella is rather a subgenus of *Buliminus* than of *Ennea*; *Bul.*

(*Pass.*) *isthmodon* and *exodon* (Martens, 1881), the latter = *Ennea balfouri* (Godw.-Aust.) : Martens, *l. c.* p. 144, pl. xxviii. figs. 5-9, Socotra.

Buliminus riebecki (Martens) = *balfouri* (Godw.-Aust.) and *B. candidissimus* (Pfr.), Socotra; *id. l. c.* pp. 146 & 147, pl. xxviii. figs. 10–13.

Achatinella. Observation concerning their 'singing'; H. Glanville Barnacle, J. of Conch. iv. p. 118.

Cionella acicula (Müll.) found in an old skull ; Martens, Nachr. mal. Ges. 1883, p. 60.

Leptinaria. [See *Testacellidæ.*]

Geostilbia mazei, sp. n., and *gundlachi* (Crosse); Mazé, J. de Conch. xxxi. p. 7, pl. i. figs. 2 & 1, Guadeloupe. *G. comorensis*, sp. n., Morelet, *tom. cit.* p. 196, Mayotte.

Stenogyra. Notes on the colouration of the animal and its carnivorous habits; Mazé, *l. c.* pp. 1, 2, 41, & 42.

Stenogyra decollata (L.), varieties; Kobelt, Iconogr. (2) i. pp. 54–56, pl. xx.

Riebeckia, subg. n. of *Stenogyra.* Type, *socotorana* (Martens) = *famificata* (Godw.-Aust.), with remarkable varieties in size and shape ; radula described, somewhat different from that of *Stenogyra*, the median tooth being not very small and the lateral teeth bicuspidate. Martens, Conchol. Mitth. ii. pp. 147–149, pl. xxix. figs. 1–8.

Stenogyra enodis (Godw.-Aust.) = *socotorana* (Martens, 1881), and *S. arguta* (Martens) = *hirsuta* (Godw.-Aust.), Socotra; *id. l. c.* p. 149, pl. xxviii. figs. 14–18.

Stenogyra lugubris and *nebulosa*, spp. nn., Morelet, J. de Conch. xxxi. pp. 399 & 400, pl. x. figs. 4 & 5, Landana, mouth of Congo.

Stenogyra glabella, *pyramidalis*, and *spinula*, spp. nn., *id. l. c.* pp. 193–195, pl. viii. figs. 9–11, Mayotte, Comore Islands.

Stenogyra didyma, sp. n., Westerlund, Nachr. mal. Ges. 1883, p. 51, Singapore.

Stenogyra aculeus, sp. n., Tapparone-Canefri, Ann. Mus. Genov. xx. p. 144, Amboina.

Subulina perrieriana, Anderta, and *mabilliana*, Abuna Yusef, spp. nn., and *munzingeri* (Jickeli, as *Acicula*); Bourguignat, Mal. Abyss. pp. 81–83, pl. ix. figs. 64–69.

Beccaria, g. n. Near *Subulina* ; shell glassy ; mouth vertical ; pillar straight, not truncated at the base. *B. isseli* (Jickeli, as *Subulina*), Bogos country. *Id. l. c.* p. 119. [Name preoccupied in the *Nudibranchia.*]

Cœliaxis (H. Ad. & Angas). P. Fischer refers *Balea australis* (Forb.) to this genus, and describes its radula, which resembles that of *Clausilia* ; he thinks that it should be placed near *Eucalodium*, but supposes that *C. layardi*, the typical species of the first authors, may belong to the *Agnatha* ; J. de Conch. xxxi. pp. 98–102, pl. iii. figs. 4–6, shell and radula.

Abbadia, g. n. Near *Balea*, but with a prominent columellar fold. *A. æthiopica*, sp. n., Bourguignat, *l. c.* p. 69, pl. x. figs. 82 & 83, Mount Zebul, Abyssinia.

Alopia glauca (Bielz) var. n. *costata* (Bielz, MS.) var. n. *ambigua*, subsp. *haueri* (Bielz) var. n. *transitans*, *A. elegans* (Bielz) subsp. n.

riessi = *fussiana-sinistrorsa* (Bielz), and var. n. *polita*, *A. livida* (Menke) var. n. *bipalatalis*, *lischkeana* (Charp.) var. n. *obesa*, *straminicollis* (Charp.) var. n. *microstoma* (Bielz, MS.) and var. n. *bœttgeri*, and a review of all the known Transylvanian species and varieties of this remarkable group, with some general remarks; Kimakowicz, Verh. siebenb. Ver. xxxiii. pp. 40–60.

Clausilia laminata var. n. *targionii*, Carrara, and *C. comensis* var. n. *regnolii*, Apuan Mountains, *itala* var. n. *gentiluomoi*, Monte Amiata, in Tuscany, *lineolata* var. *vallombrosana* (Issel) and var. n. *sororcula*, *cruciata* var. n. *apuana*, and *C. pinii* (Westerlund) = *pecchiolii* (Stefani), Apuan Mountains; Stefani, Bull. Soc. mal. Ital. ix. pp. 146–165.

Clausilia sandrii (Küst.) does not live in Dalmatia, but probably in Montenegro; *C. kneri* (Brusina, 1881) = *lesinensis* (Kutschig), not on Lesina, but near Cattaro; and *C. armata* (Kutschig), exact locality unknown: Brusina, JB. mal. Ges. xi. p. 113 (*Neritodonta*, pp. 97–102).

Clausilia (*Albinaria*) *anatolica* (Roth.) var. n. *apicalis*, Valley of Xanthus, Asia Minor, *glabella* (Pfr.) var. n. *spratti*, *strigata* (Pfr.) var. n. *orientalis*, Carpatho Island, *subvirginea*, sp. n., *troglodytes* (Ad. Schmidt) var. n. *vexans*, *sublamellosa*, sp. n., *tenuicosta* (Pfr.) var. n. *heteroptyx*, *aphrodite*, sp. n., *bigibbosa* (Charp.) var. n. *evanida*, Asia Minor, *brevicollis* (Pfr.) var. n. *casia*, Island of Casso, *astropalia*, sp. n., Island of Astropalia, *sculpticollis*, sp. n., with var. n. *unia*, Islands north of East Crete, *praeleensis*, sp. n., *manselli*, sp. n., Cavallos Islands, east of Crete, *clara* (Böttg.) varr. nn. *multicosta* and *paucicosta*, *vermiculata*, sp. n., *vesti*, sp. n., with var. n. *suturalis*, *teres* (Oliv.) varr. nn. *phalangia* and *insularis*, Island of Cophino, *carpathia*, sp. n., Island of Carpatho, *privigna*, sp. n., Sofrana Islands, *conemenosi*, sp. n., Patras, *hians* (Böttg.) var. n. *sublactea*, Ætolia, *goldfussi*, sp. n., Taygetus, *krueperi* (Pfr.) var. n. *holostoma*, Cape Catokolo, Morea, *schuchi* (Rossm.) var. n. *oscarii* (Thiesse, MS.), Sparta, *incrustata*, sp. n., Elaphonisi; *C.* (*Papillifera*) *abyssoclista*, sp. n., Epidaurus, *campylauchen*, sp. n., Laconia, (*Alinda*) *denticulata* (Oliv.) var. n. *spratti*, Island of Cos, and (*Oligoptychia*) *kephissiæ* (Roth.) var. n. *debilitata*, Bœotia: Böttger, P. Z. S. 1883, pp. 324–343, pls. xxxiii. & xxxiv. All those in which the locality is not noted are from Crete.

Clausilia (*Albinaria*) *heteropteryx*, *grabusana*, *xanthostoma*, *venosa*, and *maltzani*, spp. nn., Böttger, Nachr. mal. Ges. 1883, pp. 106–112, all from Crete.

Clausilia messenica var. n. *brenskii*; Böttger, JB. mal. Ges. x. p. 337, Messenia.

Clausilia itala var. n. *sub-late-striata*, Valsassina, and var. n. *fortis*, Mounts near Vicenza, *C. balsamoi* var. n. *variscoi*, Val Brembana, and *C. dubia* var. n. *reticulata*, Val Tellina, and var. n. *longobardica*, Plain and Mounts of Lombardy; Pini, Atti Soc. Ital. xxvi. pp. 137–143.

Clausilia gracilepta var. *eugenia* (Küst. ?), Cattaro, *intustructa* (Blanc, MS.), sp. n., Basilicata, in Southern Italy, and *euchroa*, sp. n., Eubœa, Westerlund, JB. mal. Ges. x. pp. 61–63.

Clausilia lamellata var. *miles* (Küst.) from Elis, in Greece; Böttger, JB. mal. Ges. x. pp. 331.

Clausilia plicatula (Dr.) found near Belzig, Prov. Brandenburg Friedel, Nachr. mal. Ges. 1883, p. 186.

Clausilia dense-striata (Rossm.) found in the S.E. corner of Bavaria, by C. Reuleaux; its geographical distribution sketched by O. Böttger, Nachr. mal. Ges. 1883, p. 162.

Clausilia dubia. Its varieties in Styria, including var. n. *runensis*: Tschapeck, Nachr. mal. Ges. 1883, pp. 26–32.

Clausilia rupestris, sp. n., = *obtusa* var. *rupestris* (Bourg., 1877), *C. reboudi* (Dupuy), and *C. fallax*, sp. n., = *perversa* var. *fallax* (Moq. Tand.) [not *C. fallax*, Rossm., 1836: Rec], all from the environs of Paris, described by F. Jousseaume, Bull. Soc. Zool. 1882, pp. 443, 444, & 450, the first and last figured, pl. xii. figs. 13, 14, 7, & 8.

Clausilia bicristata (Rossm., 1839) = *tetragonostoma* (Roth, *nec* Pfr.), Parnassus, in Phocis, with var. *tetragonostoma* (Pfr.), and *canaliculata*, (Pfr.), both from Mount Delphi (Dirphe), in Eubœa, and with several subvarieties; *C. oxystoma* (Rossm.) is a deformity of *tetragonostoma* (Pfr.); *C. kephissiæ* (Roth), with var. *pikermiana* (Roth), and *attica* (A. Schm.), Attica and Bœotia; *C. rothi* (Pfr.), Syra; *C. bicolor* (Pfr.), Andros, with var. n. *thermia*, Thermia; *C. castalia* (Roth), Phocis, with var. *pirostoma* (Böttg.), Rumelia?; *C. eustropha* (Böttg.), Sciatho and northern part of Eubœa; *C. unidentata* (Küst.), Eubœa; *C. cristicollis* (Westerlund) = ? *bourguignati* (Charp.) is a subvariety of *pikermiana* (Roth). All discussed at length by Böttger, Ber. offenb. Ver. xx. pp. 177–216.

Clausilia delesserti (Bourg., 1853) comprises as varieties *C. ehrenbergi* (Roth), *nervosa* (Parr.), *fauciata* (Rossm.), *bargesi* and *baudrii* (Bourg.), Beirut, and *C. mœsta* var. n. *sublævis*, Beirut and Baalbek; *id. l. c.* pp. 174 & 175.

Uncinaria elata (Rossm.) var. n. *viridana*; Kimakowicz, Verh. siebenb. Ver. xxxiii. p. 66, Transylvania.

Clausilia (*Acrotoma*) *komarowi*, *laccata*, *semicincta*, and (*Micropontica*) *closta* (Böttg.), figured, (*Euxina*) *litotes* varr. nn. *svanetica* and *ganeo*, *derasa* var. n. *svanetica*, all from Transcaucasia; Böttger, JB. mal. Ges. x. pp. 185–190, pl. vii. figs. 4–10.

Clausilia (*Euxina*) *dolium*, sp. n., Clessin, Mal. Bl. (2) vi. p. 60, pl. ii. fig. 14, Crimea, on the beach, probably Transcaucasian.

Clausilia, subg. *Phædusa*. The Chinese species critically discussed by O. v. Möllendorff, with descriptions of some species, which have been already named by Heude [see Zool. Rec. xix. *Moll.* p. 77], and *C. tau* var. n. *cyclostoma* from Canton. The following are figured:—*lorraini* (Mke.), *magnaciana* and *mœllendorffiana* (Heude), *porphyrea*, *elisabethæ*, *gerlachi*, *thaleroptyx* and *eastlakeana* (Möllend.). A new subsection, *Rufospira*, is proposed for *gerlachi*. *C. aculus* (Bens.) contains many varieties, including *shanghaiensis* (Pfr.) and *mœllendorffi* (Martens). A geographical table of all known species from Eastern Asia is added. JB. mal. Ges. x. pp. 228–269, pl. viii.

Clausilia (*Phædusa*) *loczyi*, sp. n., with var. *novem-spiralis*, Prov. Se-chuen, China; also *C. aculus* var. *mœllendorffi* (Martens) and var. *insularis* (Heude), and *C. bensoni* (H. Ad.), figured: Böttger, in Hilber's paper, SB. Ak. Wien, lxxxviii. Abth. 1, pp. 1372–1376, pl. vi. figs. 4–8.

Clausilia (*Stereophædusa*) *clavo-cincta* and *ponsonbyi* [*-bii*], spp. nn., Böttger, JB. mal. Ges. x. pp. 270 & 271, pl. viii. figs. 8 & 9, China.

Clausilia (*Garnieria*) *fuchsi*, sp. n., with var. n. *kaspari*, Prov. Kwang-si, China, *C.* (*Phædusa*) *paradoxa* and (*Euphædusa*) *simiola*, spp. nn., Prov. Hu-nan, China; Gredler Drei neue Clausilia-Arten, pp. 1–6. The subgenus *Garnieria* appears to be new, but is not distinctly characterized.

Clausilia sarcochila, *septemlamellata* and *missionis*, new names for *pachystoma*, *septemplicata* and *straminea* (Heude), all preoccupied; Ancey, Nat. Sicil. 1883, p. 17.

Clausilia moluccensis var. n. *majuscula* from Celebes; Tapparone-Canefri, Ann. Mus. Genov. xx. p. 171.

Pupa frumentum (Dr.) and *avenacea* (Brug.). Italian varieties; Stefani, Bull. Soc. mal. Ital. ix. pp. 126–133.

Pupa secale var. *edentula* (Taylor) from Yorkshire and Sussex; Taylor, J. of Conch. iv. p. 68.

Pupa gourdoniana, sp. n., Fagot, Moll. du Pic du Gar, 1882, p. 11, top of Pic du Gar, Dép. Haute-Garonne.

Pupa avenacea (Brug.) var. n. *clienta*; Westerlund, JB. mal. Ges. x. p. 60, Tatra, Carpathian Mountains.

Pupa bipalatalis, sp. n., Luchon, Pyrenees, and note on *P. eudolicha* (Bourg.); *id.* Nachr. mal. Ges. 1883, pp. 172 & 173.

Pupa ringens (Jeffr.) in Sutherlandshire; Baillie, J. of Conch. iv. p. 24.

Pupa heldi (Cless.), Schönthal, in Württemberg; Weinland, JH. Ver. Württ. 1883, p. 122.

Pupa claustralis (Gredl.) var. n. *corcyrensis*; Böttger, JB. mal. Ges. x. p. 318, Corfu.

Pupa hæusleri, sp. n., Sterki, Nachr. mal. Ges. 1883, p. 72, woodcut, Brugg, in Aargau, Switzerland.

Pupa blandi (Morse), from Little Missouri; Reinhardt, SB. nat Fr. 1883, p. 37.

Pupa (*Charadrobia*) *pulchra*, sp. n., Retowski, Mal. Bl. (2) vi. p. 57, Crimea, on the beach, probably Transcaucasian.

Pupa (*Charadrobia*) *superstructa* (Mouss.) varr. nn. *lederi* and *zonata*; Böttger, JB. mal. Ges. x. pp. 180–182, pl. vii. figs. 2 & 3, Transcaucasia. *P. clavella* and *opisthodon* (Reinhardt) are varieties of *claustralis* (Gredl.); *id. l. c.* p. 184.

Pupilla raffrayi and *globulosa*, spp. nn., both comprised by Jickeli under *fontana* (Krauss), Abuna Yusef, Abyssinia; Bourguignat, Mal. Abyss. pp. 71 & 72.

Pupa (*Pupilla*) *wöli*, *chinensis*, and *richthofeni*, spp. nn., and *muscorum* (L.), found in the löss of the Province Kau-su, China; Hilber, SB. Ak. Wien, lxxxviii. Abth. 1, pp. 1376–1379, pl. vi. figs. 9–12.

Pupa dorsata, sp. n., Ancey, Le Nat. 1881, pp. 373 & 407, China.

Pupa recondita and *microsoma*, spp. nn., Tapparone-Canefri, Ann. Mus. Genov. xix. pp. 106 & 107, pl. ii. figs. 1–4, Aru Islands.

Pupa indigena (Ancey); Mazé, J. de Conch. xxxi. p. 21, Guadeloupe.

Orcula jetschini, sp. n., = *Pupa dolium* (Bielz, *nec* Drap.), South-western part of Transylvania; Kimakowicz, Verh. siebenb. Ver. xxxiii. p. 34.

Vertigo pygmæa (Dr.) var. n. *ausonia*, *V. callicratis* (Scacchi) varr. nn. *nodosaria*, *marcuccii*, and *simii*, Apuan Mountains, and *V. dinii*, sp. n., Apennines; Stefani, Bull. Soc. mal. Ital. ix. pp. 140-143.

Vertigo moulinsiana (Dupuy). Its British distribution: Groves, Tr. Hertf. Soc. i. [1880], pl.; abstract in J. of Conch. iv. p. 85.

Pupa (*Vertigo*) *krauseana*, sp. n., Chukchi Peninsula, and *decora* (Gould) = *borealis* (Morelet), Alaska; Reinhardt, SB. nat. Fr. 1883, pp. 38 & 39.

Pupa (*Vertigo*) *selebensis*, sp. n., Tapparone-Canefri, Ann. Mus. Genov. xx. p. 171, pl. i. figs. 12 & 13, Macassar, Celebes.

Boysidia, subg. n. of *Pupa*, Ancey, Le Nat. 1881, p. 374 [not seen by Recorder.]

Goniognatha.

Phrixgnathus, g. n. Mantle reflected over the shell anteriorly; no locomotive disc to the foot [?]; jaw papillate, imbricately folded; teeth quadrate, the laterals bicuspid; shell conical or turbinated, of 5–6 gradually increasing whorls; peristome thin, straight. *Helix fatua* (Pfr.) and *P. marginatus*, sp. n., New Zealand. Hutton, Tr. N. Z. Inst. xv. pp. 136 & 137.

Bulimulus forreri, sp. n., Mousson, J. de Conch. xxxi. p. 217, pl. ix. fig. 2, Durango, California.

Bulimulus schiedeanus (Pfr.). Jaw described and radula figured by Binney, Bull. Mus. C. Z. xi. p. 160, pl. iii. fig. *k*.

Bulimulus houelmontensis, sp. n., Crosse, Island of Guadeloupe, and biological notes on *B. multifasciatus* (Lam.) var., *B. exilis* (Gm.), *lherminieri* (Fischer), and *chrysalis* (Pfr.), new var.; Mazé, J. de Conch. xxxi. pp. 16–20, pl. i. fig. 6, also pp. 43 & 52.

Bulimulus obliquus (Rv.), with many variations in colour, including *jeffreysi* (Pfr.), from Eastern Brazil; Dohrn, JB. mal. Ges. x. p. 352, pl. xi. figs. 8–15.

Amphibulima patula (Brug.) living on the Island Marie Galante; Mazé, J. de Conch. xxxi. p. 49.

Rhodonyx rubescens (Desh.) from Marie Galante; *id. ibid.*

Elasmognatha.

Succinea. Critical notes on the species created by G. Servain in his "Histoire Malacologique du lac Balaton," given by J. Hazay, Mal. Bl. (2 vi. pp. 184–187.

Succinea chrysis and *annexa*, spp. nn., Westerlund, Nachr. mal. Ges. 1883, pp. 51 & 52, Port Clarence, N.W. extremity of America. The former also found by A. Krause on both sides of Bering Straits; SB. nat. Fr. 1883, pp. 33 & 36.

Succinea erythrophana, new name for *rubella* (Heude, *nec* Pease); Ancey,

Nat. Sicil. 1883, p. 17, China. The same and *S. oblonga* (Dr.), the latter from the löss of Kan-su, figured by Hilber, SB. Ak. Wien, lxxxviii. Abth. 1, pp. 1379 & 1380, pl. vi. figs. 13–15.

Succinea poirieriana and *æthiopica*, spp. nn., Hamaeen, and *adowensis* (Bourg, 1879) = *striata* (Jickeli, *nec* Krauss); Bourguignat, Mal. Abyss. pp. 25–27, pl. viii. figs. 47, 48, & 55–58.

Homalonyx unguis (Orb.) var. *guadeloupensis*; Mazé, J. de Conch. xxxi. p. 25.

Pellicula depressa (Rang) and *appendiculata* (Pfr.). Biological notes; *id. l. c.* pp. 23 & 24.

Vaginulidæ.

Vaginula subaspersa, Nossi-comba Island, near Madagascar, and *comorensis*, Mayotte Island, spp. nn., Fischer, J. de Conch. xxxi. p. 55, the latter pl. ii. fig. 3.

Vaginulus reticulatus, sp. n., Westerlund, Nachr. mal. Ges. 1883, p. 49, Ceylon.

Vaginulus stuxbergi, sp. n., *id. l. c.* p. 165, Kalias, Borneo.

Veronicella prismatica, sp. n., Tapparone-Canefri, Ann. Mus. Genov. ix. p. 207, pl. xi. figs. 6–8, Sorong Island, New Guinea.

Rathouisia, g. n. Type, *Vaginulus sinensis* (Heude); short description. Heude, J. de Conch. xxxi. p. 394.

Onchidiidæ.

Oncidiella (Gray). Tapparone-Canefri maintains the generical characters, as proposed by Gray, against the objection of Semper [Zool. Rec. xiv. *Moll.* p. 56], and calls attention to several resemblances of the *Onchidiidæ* to the *Limnæidæ*. *O. tabularis*, new name for *Onchidium planatum* (Quoy & Gaim.). Ann. Mus. Genov. xix. pp. 208–212.

Auriculidæ.

Pythia chrysostoma, South coast of New Guinea, and *obesula*, Kei Islands, spp. nn., Tapparone-Canefri, *l. c.* pp. 237 & 238, pl. i. figs. 25–30.

Cassidula sowerbiana (Pfr.), Aru Islands; *id. l. c.* p. 227, woodcut.

Auricula helvacea (Phil.) from Australia and New Guinea; *id. l. c.* pp. 219 & 220, woodcut.

Melampus hyalinus, sp. n., Morelet, J. de Conch. xxxi. p. 200, pl. viii. fig. 15, Mayotte. *M. concretus* (Mor.), Mayotte and New Caledonia; *id. l. c.* p. 206.

Leuconia hemphilli, sp. n., Dall, P. U. S. Nat. Mus. vi. p. 323, pl. x. fig. 6, Florida, on mudflats.

Limnæidæ.

Critical notes on Bourguignat's & Servain's classification of *Limnæa*; Hazay, Mal. Bl. (2) vi. pp. 190–194.

Limnæa truncatula. On its parasite, the larva of the liver-fluke [*vide suprâ*, p. 20].

Limnæa palustris var. n. *fasciata*, Nelson, J. of Conch. iv. p. 26, Leeds, and var. n. *globosa*, Taylor, *tom. cit.* p. 84, pl. i. fig. 4, Enfield.

Limnæa peregra var. n, *stagnaliformis*, Taylor, *l. c.* p. 82, pl. i. fig. 2, Flamborough, Yorkshire. *L. peregra* var. *burnetti* (Ald.), in Loch Skene; [Miss] J. Hele, *tom. cit.* p. 124.

Limnæa peregra (Müll.) var. n. *antixianæ*; Stefani, Bull. Soc. mal. Ital. ix. p. 172, Antisciana, Apuan Mountains.

Limnæa taurica, sp. n., Clessin, Mal. Bl. (2) vi. p. 50, pl. ii. fig. 5, Crimea.

Limnæa onychia, sp. n., Westerlund, Nachr. mal. Ges. 1883, p. 52, Lake Biwa, Japan.

Limnæa scalaris, sp. n., *id. l. c.* p. 165, Port Clarence, North-west America.

Limnæa axiaca, Orontes River, and *antiochiana*, Lake of Antioch, spp. nn.; *L. lagodeschina* (Bourg., MS.), *tripolitana* (Letourneux, MS.), *callopleura*, *reneana*, *chantrei*, *homsiana*, *lagotiformis*, *subpersica*, and *peregriformis*, spp. nn., Lake of Homs: Locard, Ann. Mus. Lyon, iii. pp. 263, 264, & 278–286, pl. xxiii. figs. 8–43.

Limnæa caillaudi, *acroxa*, *alexandrina*, *raffrayi*, *æthiopica*, spp. nn., and *africana* (Rüppell, MS.); Bourguignat, Mal. Abyss. pp. 89–96, pl. x. figs. 94–101, Abyssinia: the first, near *stagnalis* (L.), and in Lake Dembea.

Physa humerosa, *heterostropha*, and *virgata* intergrading perfectly with one another in Colorado Desert; Dall, Science, i. No. 7, p. 202. Varieties of the former in the same district; Stearns, Am. Nat. xvii. pp. 1016–1018, woodcut.

Physa, spp. from Cooper's Creek, Central Australia; Saenger, Am. Nat. xvii. p. 1184, with woodcut.

Physa (*Plesiophysa*) *guadeloupensis* (Fischer) and *striata* (Orb.). Biological notes; Mazé, J. de Conch. xxxi. pp. 30 & 31.

Physastra, subg. n. of *Physa*. Limnæiform, sinistral, with a deciduous rough periostracum. *P. vestita*, sp. n., Great Kei Island, near New Guinea. Tapparone-Canefri, Ann. Mus. Genov. xix. pp. 245 & 246, pl. i. figs. 20 & 21.

Physa hypnorum (L.) var. n. *picta*; Krause, SB. nat. Fr. 1883, p. 33, Chukchi Peninsula.

Aplecta sowerbyana (Orb.) var. n. from Guadeloupe; Mazé, J. de Conch. xxxi. pp. 30 & 45.

Planorbis. S. Clessin continues his monograph in Küster's Conch. Cab. pt. 320, pp. 56–110, pls. xviii.–xxii., treating chiefly the group of *P. albus* (Müll.). The following are not before figured:—*dispar* (Westerl.), Sweden, p. 103, pl. xix. fig. 10, *refulgens*, *salleanus*, and *riisii* (Dunker, the last MS.), West Indies, and *kuehnerianus* (Dkr.), Surinam, pp. 106–109, figured on pls. xvi. & xvii., which are contained in the preceding part.

Planorbis contortus (Müll.). Bright pink or scarlet variety, due to the colour of the animal, at Leeds: Nelson, J. of Conch. iv. p. 128.

Planorbis contortus (L.) var. n. *spondyloides*; Weinland, JH. Ver. Württ. 1883, p. 122, woodcut, Schönthal, in Württemberg.

Planorbis lineatus [*nitidus*, Müll.]. Septa also in half-grown shells; Taylor, J. of Conch. iv. p. 37.

Planorbis tiberii, sp. n., Apennines of Northern Tuscany, and *paulucci-anus* (Caroti), Apuan Mountains; Stefani, Bull. Soc. mal. Ital. ix. pp. 176 & 177.

Planorbis (*Hippeutis*) *syracusanus* (Cafici, MS.); Westerlund, Nachr. mal. Ges. 1883, p. 169, Anapo River, Sicily.

Planorbis antiochianus, sp. n., Locard, Ann. Mus. Lyon, iii. p. 262, pl. xxiii. figs. 5–6, Lake of Antioch.

Planorbis herbini and *æthiopicus*, spp. nn., the latter = *costulatus* var. (Jickeli); Bourguignat, Mal. Abyss. p. 101, Abyssinia.

Planorbis hildebrandti, sp. n., Martens, JB. mal. Ges. x. p. 83, Madagascar.

Planorbis exustus var. n. *maculatus*, *P. socotrensis* and *cockburni*, spp. nn., all from Socotra; Godwin-Austen, P. Z. S. 1883, pp. 3 & 4, pl. i. figs. 1–3.

Planorbis (*Gyraulus*) *illibatus* and *hiemantium*, Japan, *demissus* and *associatus*, Ceylon, (*Segmentina*) *mica*, Japan, *spirodelus*, Ceylon, and (*Hippeutis*) *versicolor*, Ceylon, spp. nn., Westerlund, Nachr. mal. Ges. 1883, pp. 53–55; *P.* (*Gyrulus*) *liratus*, sp. n., *id. l. c.* p. 165, Ceylon.

Planorbis turbinellus, sp. n., Tapparone-Canefri, Ann. Mus. Genov. xix. p. 248, pl. i. figs. 22–24, Aru Islands.

Caillaudia, g. n. Distinct from *Planorbis* by the convexity of the spire. *C. letourneuxi* (Bourg., 1879), Lower Egypt, and *C. angulata*, Hamacen, the latter = *Planorbis costulatus* var. (Jickeli); Bourguignat, Mal. Abyss. pp. 128 & 129, pl. viii. figs. 49–52.

Pompholyx. Variations from smooth to strongly costate shell, some becoming umbilicate, from a calcareous deposit in Nevada; Dall, Science, i. p. 202.

Ancylus. Anatomy of *A. fluviatilis* and *lacustris*; B. Sharp, P. Ac. Philad. 1883, pp. 214–240, pl.

Ancylus lacustris var. *albida* at Christchurch; Ashford, J. of Conch. iv. p. 13.

Ancylus amnicola, sp. n., Stefani, Bull. Soc. mal. Ital. ix. p. 179, Apuan and Apennine Mountains.

Ancylus hamacenicus, new name for *compressus* (Jickeli, *nec* Parreyss, *nec* Nyst); Bourguignat, Mal. Abyss. p. 84, Abyssinia.

SIPHONARIIDÆ.

F. W. Hutton, Tr. N. Z. Inst. xv. pp. 141–145, pl. xvii. [Zool. Rec. 1882, *Moll.* p. 83], gives descriptions of shells and dentition, with some notes on the anatomy of the recognized New Zealand species, viz.:—*Siphonaria obliquata*, Sow. (*scutellum*, Deshayes), *australis*, Q. & G., *zealandica*, Q. & G., *redimiculum*, Rve., and *Gadinia nivea*, Hutt. The plate

represents details of alimentary and reproductive systems, jaw, radula, and teeth.

PULMONATA OPERCULATA.

Cyclophoridæ.

Cyclotus novo-guineensis, sp. n., = *papua* (Hombr. & Jacq., *nec* Q. & G.), New Guinea; *C. ? poirierii*, *tristis*, Southern New Guinea, and *rugatellus*, Aru Islands, spp. nn.: Tapparone-Canefri, Ann. Mus. Genov. xix. pp. 251–257, pl. x. figs. 1-9.

Cyclotus schomburgianus, sp. n., Hai-an, in Southern China, and *taivanus* (H. Ad.), redescribed; Möllendorff, JB. mal. Ges. pp. 283 & 284, the former also in Nachr. mal. Ges. 1883, p. 65.

Cyclophorus depictus, sp. n., Tapparone-Canefri, Ann. Mus. Genov. xx. p. 174, pl. i. figs. 4–6, Kandari, Islands of Celebes.

Cyclophorus raripilus (Morelet): operculum described; Morelet, J. de Conch. xxxi. p. 207. *C. atomus* (Morelet) belongs probably to *Adcorbis*; id. *l. c.* p. 208.

Cyclophorus friesianus, sp. n., Möllendorff, Nachr. mal. Ges. 1883, p. 66, and JB. mal. Ges. x. p. 286, Formosa.

Leptopoma intermedium (Martens, as variety), distinguished as species from *vitreum* (Less.), radula of both figured; *L. multilabre* (Lam., Pfr.) is a monstrous variety of *massenæ* (Less.); and *L. venustulum*, sp. n., Port Dorey, New Guinea: Tapparone-Canefri, Ann. Mus. Genov. xix. pp. 261–263, pls. ix. figs. 6–8, & x. figs. 10 & 11. *L. bicolor* (Pfr.) var. n. *dimidiatum*, Moluccas; *id. op. cit.* xx. p. 165.

Leptopoma taivanum, sp. n., Möllendorff, Nachr. mal. Ges. 1883, p. 66 and JB. mal. Ges. x. p. 287, pl. x. fig. 4, Formosa.

Leptopoma pannosa and *calva* [*-um*], spp. nn., Hutton, Tr. N. Z. Inst. xv. p. 140, New Zealand.

Amphicyclotus maleri, sp. n., Crosse & Fischer, J. de Conch. xxxi. p. 102, Prov. Tabasco, Mexico.

Alycæus pilula (Gould) from Hongkong; Möllendorff, JB. mal. Ges. x. p. 281, pl. x. fig. 6.

Pupinidæ.

Pupinella crossii (Brazier); Tapparone-Canefri, Ann. Mus. Genov. xix. p. 267, pl. x. figs. 20 & 21, Yule Island, New Guinea.

Bellardiella, g. n. Near *Pupinella*; umbilicated, the lower channel of the aperture opened outwards and behind the peristome. *B. martensiana*, sp. n., Port Dorey, New Guinea. *Id. l. c.* p. 266, pl. x. figs. 20 & 21.

Pupina paviei and *crosseana*, spp. nn., Morlet, J. de Conch. xxxi. pp. 107 & 108, pl. iv. figs. 4 & 5, Cambodia.

Pupina speculum, sp. n., Tapparone-Canefri, Ann. Mus. Genov. xix. p. 270, pl. x. figs. 14 & 15, Port Dorey, New Guinea.

Pupina juedelliana, sp. n., Möllendorff, Nachr. mal. Ges. 1883, p. 66, and JB. mal. Ges. x. p. 288, pl. x. fig. 5, Hainan Island.

Diplommatinidæ.

Moussonia papuana, sp. n., Tapparone-Canefri, Ann. Mus. Genov. xix. p. 269, pl. x. figs. 16 & 17, Aru Islands.

Cyclostomatidæ.

Cyclotopsis nevillii (Morelet): description completed; Morelet, J. de Conch. xxxi. p. 202. *C. dubia* (Morelet): operculum described; *id. l. c.* p. 208.

Cyclotopsis? radiolata (Martens, 1881, as *Cyclostoma*); Martens, Conchol. Mittb. ii. p. 143, pl. xxviii. figs. 1–4, Socotra.

Cyclostoma elegans var. n. *subsulcatum*, in a Post-pliocene bed near Stradella, Lombardy; Pini, Atti Soc. Ital. xxvi.

Cyclostoma moniliatum (Morelet). Operculum described; Morelet, J. de Conch. xxxi. p. 207.

Cistula sargi, sp. n., Crosse & Fischer, J. de Conch. xxxi. p. 103, Guatemala.

Cistula consepta, sp. n., Martens, JB. mal. Ges. x. p. 8, and Ann. N. York Ac. ii. p. 371, Porto Rico.

Chondropoma crenulatum (Fér.) and *julieni* (Pfr.); Mazé, J. de Conch. xxxi. p. 34, pl. i. figs. 7 & 8, Guadeloupe.

Chondropoma tortolense var. n. *major*; Martens, Ann. N. York Ac. ii. p. 371, Porto Rico.

Realia (?) *isseliana*, sp. n., Tapparone-Canefri, Ann. Mus. Genov. xix. p. 271, pl. x. figs. 12 & 13, Aru Islands.

Pomatias. The known species enumerated and distributed into five sections, *Auritus*, *Maculatus*, *Personatus*, *Anotus*, and *Turritus*, by Westerlund, JB. mal. Ges. x. pp. 64–72. *P. blancianus*, sp. n., Sicily, *auritus* (Z.) var. n. *chelys*, Cattaro, and *lapurdensis* (Fagot) var. n. *labrosa*, Montserrat, in Spain; *id. l. c.* pp. 63 & 64.

Pomatias oostoma, sp. n., Westerlund, Nachr. mal. Ges. 1883, p. 168, Julian Alps. *P. caficii* and *agatocles* (Benoit) redescribed, and *battgeri*, sp. n., Palermo; *id. l. c.* pp. 170 & 171.

Pomatias pauluccianum [*-us*] (Caroti); Stefani, Bull. Soc. mal. Ital. ix. p. 188, Apuan Mountains.

Pomatias tessellatus (Rossm.) var. n. *moussoni*; Böttger, JB. mal. Ges. x. p. 320, Corfu.

Pomatias spelæus, sp. n., Fagot, Bull. Soc. Ramond, Toulouse, 1876, p. 62, Cave of Bedat, near Bagnère-de-Bigorre, Dép. Hautes-Pyrénées. [Hitherto omitted from Zool. Rec.]

Truncatellidæ.

Acme beneckii and *sublineata*, spp. nn., and *lineata* (Drap.) described for comparison, all from Val Brembana, Southern Alps; Andreae, Nachr. mal. Ges. 1883, pp. 137–139, woodcuts.

Acme lineata (Hartm.) var. n. *corcyrensis*, Corfu, and *A. reitteri*, sp. n., Cephalonia; Böttger, JB. mal. Ges. x. pp. 319 & 326.

Acme moutoni (Dupuy) distinct from *veneta* (Pirona) [Mme.] Paulucci, Bull. Soc. mal. Ital. ix. pp. 5–8.

Assimineidæ.

Assiminea. Observations on the habits of this genus, taken from other authors; A. Morelet, Le Nat. v. p. 198.

Assiminea grayana (Leach) found near Emden, and observed alive; it lives at highwater-mark, and soon leaves the water when thrown into it: Borcherding, Abh. Ver. Brem. viii. pp. 329 & 330.

Assiminea castanea, sp. n., Westerlund, Nachr. mal. Ges. 1883, p. 56, Yokohama.

Assiminea granum (Morelet) = *Hydrocena hidalgoi* (Gassies), Mayotte and New Caledonia; Morelet, J. de Conch. xxxi. p. 208.

Cyclotropis, g. n. Near *Assiminea*; feelers short, eyes on their tips; umbilicus surrounded by a keel. For *Omphalotropis maculata* (Martens) [Lea.—Rec.] and *C. papuensis*, sp. n., Fly River, New Guinea. Tapparone-Canefri, Ann. Mus. Genov. xix. pp. 278 & 279, pl. x. figs. 22 & 23.

Helicinidæ.

Helicina derepta, sp. n., Tapparone-Canefri, *op. cit.* xx. p. 167, pl. i. figs. 7 & 8, Amboina.

Helicina coxeni, Yule Island, New Guinea, and *leucostoma*, Fly River, Southern New Guinea, spp. nn., *id. op. cit.* xix. pp. 274 & 275, pl. ix. figs. 10–13, woodcuts.

Helicina durangoana, sp. n., Mousson, J. de Conch. xxxi. p. 218, pl. ix. fig. 3, Durango (California).

Helicina euglypta (Crosse) and *picta* (Fér.) varr. from Guadeloupe; Mazé, J. de Conch. xxxi. pp. 37 & 38.

Hydrocena? dubiosa (C. B. Adams, as *Truncatella*); id. *l. c.* p. 36, Guadeloupe.

SOLENOCONCHÆ.

Dentalium ergasticum, sp. n., alive more than 9 cm. long, depths of the Atlantic; and notes on some other species: P. Fischer, C.R. xcvi. pp. 77–79.

BIVALVIA.

M. Neumayr proposes, chiefly from a palæontological point of view, a new classification of the *Bivalvia*, as follows:—

Ord. 1. Palæoconchæ, or *Cryptodonta*. Shell thin, without teeth, or only with feeble indications of them in the hinge; two equal muscular impressions; pallial line entire. Palæozoic.

Ord. 2. Desmodonata. Teeth of the hinge none or irregular, connected with the ligamental processes; two equal muscular

impressions; pallial line sinuated. *Pholadomyidæ*, *Corbulidæ*, *Myidæ*, *Anatinidæ*, *Mactridæ*, *Paphiidæ*, *Glycymeridæ*, ? *Solenidæ*, and all *Tubicola*.

Ord. 3. TAXODONTA. Teeth of the hinge numerous, not differentiated, in a straight, arcuated or angular row; two equal muscular impressions. *Arcidæ*, *Nuculidæ*.

Ord. 4. HETERODONTA. Teeth of the hinge few, distinctly separated as cardinal and lateral, alternating, exactly filling the pits of the opposite valve; two equal muscular impressions. *Unionidæ*, *Cardiniidæ*, *Astartidæ*, *Crassatellidæ*, *Megalodontidæ*, *Chamidæ*, *Tridacnidæ*, *Erycinidæ*, *Lucinidæ*, *Cardiidæ*, *Cyrenidæ*, *Cyprinidæ*, *Veneridæ*, *Gnathodontidæ*, *Tellinidæ*, *Donacidæ*. The *Trigoniidæ* will form a distinct suborder.

Ord. 5. ANISOMYARIA, or *Dysodonta*. Teeth of the hinge none or irregular; two very inequal or only one muscular impression; pallial line entire.

(A) Heteromyaria: *Aviculidæ*, *Mytilidæ*, *Prasinidæ*, *Pinnidæ*.

(B) Monomyaria: *Pectinidæ*, *Spondylidæ*, *Anomiidæ*, *Ostreidæ*.

He thinks that *Desmodonta*, *Trigonidæ*, and *Taxodonta* may be directly derived from the *Palæoconchæ*; that the *Taxodonta* may have been further developed into the *Heterodonta* and *Heteromyaria*; and that the *Monomyaria* are derived from the latter. SB. Ak. Wien, lxxxviii. Abth. 1, pp. 385–419, 2 pls., representing the hinges of various recent and fossil genera. [This proposal has several considerable advantages in comparison with hitherto accepted classifications, viz.:—(1) The distinction of a limited number of natural types, instead of an artificial separation into *Monomyaria* and *Dimyaria*, or *Asiphonida* and *Siphonida*; (2) the union of the *Heteromyaria* and the *Monomyaria* into one common chief division; (3) the constitution of a special chief division for the *Arcidæ* and *Nuculidæ*, as these families offer very peculiar characters as well in the shell as in the gills and foot, and have hitherto been placed either between the *Aviculidæ* and *Mytilidæ*, or between the *Mytilidæ* and *Unionidæ*, disturbing in each case a natural series. But it may be regretted that the author has not given any regard to the more important differentiated characters of the soft parts; and it is by no means certain that either the *Mactridæ* and *Veneridæ*, or the *Paphiidæ* and *Donacidæ*, are so very deeply different *inter se*, or that they originate from such different sources, as the author endeavours to make out. The new terms of orders and suborders will, however, be used in the following Record, as this classification is more convenient than that formerly followed.—REC.]

MONOMYARIA.

OSTREIDÆ.

Ostrea. P. P. C. Hoek gives a very accurate and long list of works and papers relating to the oyster, as well those conchologically descrip-

tive of the edible and other species, as those referring to anatomy, physiology, and artificial breeding, with short abstracts of the contents of the more important ; Tijdschr. Ned. Dierk. Ver. Suppl. i. pp. 1–112.

Description of the renal organ of the oyster by J. A. Ryder, and of the genital organs by P. P. C. Hoek; *vide suprà*, Anatomy and Physiology, pp. 15 & 17.

J. A. Ryder has observed in *Ostrea virginea* that the very young shell, just hatched and still free, is equivalvular and equally convex on both sides, and has a laminar, homogeneous, non-prismatic structure; it then fixes itself at the free border of the lower valve by a pallial secretion (probably conchioline) of the periostracum, the embryonal part of the shell remaining inclined upwards ; and from that time the newly-formed parts of the shell are of prismatic structure, and those of the lower valve are attached to the foreign body for some time. Bull. U. S. Fish. Comm. ii. pp. 383–386, pl.

J. A. Ryder gives an account of a successful experiment of rearing artificially-fertilized eggs of oysters in ponds at Stockton, Maryland, as practised for many years in France, and adds some interesting particulars of the habits and growth of the oyster. The food of very young oysters is largely composed of *Bacteria*; in the stomach of the adult, are often found very young oysters, from $\frac{1}{500}$–$\frac{1}{300}$ of an inch in diameter, *Diatomaceæ*, very young Cirripeds, and marine *Infusoria*, e.g., *Tintinnus*. The young Virginian oyster attaches itself very soon, twenty-four to forty-eight hours after the eggs have been fertilized, and grows considerably after the time of attachment before the valves lose the perfect symmetry of the larval stage. Green-gilled oysters are by no means noxious to man, the colour arising from vegetable and not mineral matter. Bull. U. S. Fish. Comm. iii. pp. 281–294 ; also Science, 1883, pp. 60–62.

The Infusorian *Trypanosoma* and *Hexamitus* found in the stomach and intestines of *Ostrea edulis* and *O. angulata* in France by A. Certes, C.R. xciv. [1882] p. 463, and Bull. Soc. Zool. vi. [1882] p. 346, pl. vii. ; the former also in the crystalline style of oysters from Schleswig by K. Möbius, Zool. Anz. 1883, p. 148.

On some instances of pearls found in oysters, and differences between *Ostrea edulis* (L.) and *O. hippopus* (Lam.) ; E. Friedel, Nachr. mal. Ges. 1883, pp. 46–48.

A new disease in oysters at Rappahannok ; Kobelt, Nachr. mal. Ges. 1883, p. 116.

Möbius's treatise on the oyster [Zool. Rec. xiv. *Moll.* p. 86] is translated in U. S. Fish. Comm. Rep. for 1880, published in 1883, pp. 683–751, with index and electrotypes of the figures Also some other papers on French oyster culture by F. Fraiche (n. d.), Coste, 1861, with many tables, De Bon, 1875, G. Bouchon-Brandely, 1878, J. R[illegible]nd, 1878, and A. E. Hausser, 1876 ; on Dutch oyster culture, by an anonymous author, 1881, and P. P. C. Hoek, 1879; and on the Norwegian, by [illegible]al Rasch : pp. 753–1043.

P. Brocchi & G. Musset have written a treatise on the breeding of oysters [title, *suprà*]. H. Griesbach treats the same subject, with special regard to oysters in Schleswig-Holstein. Kosmos, xiii. pp. 449–463, 2 pls.

Oyster fishing and oyster culture, as represented in the International Fisheries Exhibition, are the subjects of a paper in Nature, xxviii. pp. 415 & 416. A short note on oyster culture in Connecticut, in Nachr. mal. Ges. 1883, p. 60.

Ostrea stentina (Payr.). Synonymy; Monterosato, Nat. Sicil. iii. p. 87.

Ostrea virginiana (Gm.). Report on the oyster-beds in the James River, by F. Winslow, U. S. Coast Surv. Rep. 1881, Appendix No. 11; also separately (Washington: 1882, 4to), 87 pp., 22 pls., 3 maps; abstract by W. Dall, in Science, ii. pp. 440-443.

Ostrea glomerata (Gould) and *subtrigona* (Sow.) are only varieties of one species, according to Woodward, a successful commercial cultivator of New Zealand oysters, but are quite distinct species according to J. C. Cox, P. Linn. Soc. N. S. W. vii. pp. 555–559. The former reaches as far north as Moreton Bay; *id. ibid.*

Margariona [see Zool. Rec. xix. *Moll.* p. 96]. Note by Dall, Science, 1883, p. 51.

Pectinidæ.

Lima goliath, sp. n., very near *excavata* (Fabr.); Sowerby, P. Z. S. 1883, p. 30, pl. vii. fig. 3, Japan.

HETEROMYARIA.

Aviculidæ.

A general treatise on pearls and pearl fishery, by W. Dall, and special notes on the pearl fishery at the Bahrein Islands and in the Gulf of California [*suprà*, p. 37].

Mytilidæ.

A species of *Mytilus*, living in fresh-water in the River Sicho, Prov. Hupe, China, announced by Neumayr, JB. Mineral. ii. pp. 21 & 22.

Mytilaster, g. n. Type, *Mytilus minimus* (Poli). *M. solidus*, sp. n., Monterosato, Nat. Sicil. 1883, p. 89, Palermo.

Gregoriella, g. n. Type, *Modiola sulcata* (Risso). *Id. l. c.* p. 90.

[*Lithodomus.*] W. Dunker finishes his monograph of *Lithophaga* in Küster's Conch. Cab. pt. 320, pp. 9–32. The new species are:—*L. castanea*, locality unknown, *crenulata*, Porto Cabello, *jeffreysi*, Samoan Isl[illegible]s, *zitteliana*, Japan, and *reticulata*, Java; the figures of them are [illegible]n pls. iii. & iv. pt. 316 [1882].

Modiolaria corrugata (Stimps.) var. n. *glacialis*, *M. lævis* (Beck) and *lævigata* (Gray); Leche, in Nordenskiöld's Vega Exped. Vetensk. Iakt. iii. pp. 450 & 451, pl. xxxiv. figs. 27–34, Northern coast of Siberia.

Crenella faba (Fabr.) and *decussata* (Mont.) from Labrador; K. Bush, P. U. S. Nat. Mus. vi. p. 244, pl. ix. figs. 2 & 3.

Dreissenidæ.

Dreissenia bourguignati and *chantrii*, spp. nn., Locard, Ann. Mus. Lyon, iii. pp. 260 & 261, pl. xxiii. figs. 1–4, both from the Euphrates and Lake of Antioch.

TAXODONTA.

Arcidæ.

Pectunculus robustus, sp. n., Sowerby, P. Z. S. 1883, p. 31, pl. vii. fig. 4, locality unknown.

Nuculidæ.

Leda pernula (Müll.) varr. nn. *costigera* and *lamellosa*; Leche, in Nordenskiöld's Vega Exped. Vetensk. Iakt. iii. pp. 447 & 448, pl. xxxiii. figs. 23–26, Northern coast of Siberia.

Yoldia arctica (Gray) var. n. *inflata* and *Y. hyperborea* (Lov.); Leche, *l. c.* pp. 444 & 445, pl. xxxiii. figs. 16–22, Northern coast of Siberia. *Y. arctica* (Gray) very common in the sublitoral region of the Kara Sea, Stuxberg, *op. cit.* i. p. 756, woodcut.

HETERODONTA.

Unionidæ.

Critical notes on the species of *Unio* and *Anodonta* of Lake Balaton distinguished by Servain; they are all well-known species in various stages of age: Hazay, Mal. Bl. (2) vi. pp. 195 & 196.

J. R. Bourguignat criticizes some determinations of Italian *Unionidæ* by Stabile and Kobelt, and enumerates 53 species, arranged in 20 groups. The following are new:—*Unio latinus*, Pontine Marshes, *sebinensis* (Uzielli, MS.), Lake d'Iseo, *campsus* (Uzielli, MS.), Pisa, *verbanicus* (Letourneux, MS.), Lago Maggiore, *glaucinus* (Ziegl. ?), Milan, *gurkensis** (Ziegl.), Lake Garda, *delpretii*, Lake Mergozzo, near Lago Maggiore, *benoiti*, Sicily, *uziellii*, Rome, *vittorioi*, Pisa, *pisanus* (Uzielli, MS.), Pisa, *villæ* (Stabile, MS.), Milan, *veillanicus* (Blanc, MS.), Lago d'Avigliana, *gentiluomoi*, locality not indicated, *pecchiolii*, Arno, *monterosati*, Lentini, in Sicily, *bivonianus*, new name for *turtoni* (Philippi, *nec* Payrandeau), Syracuse, *blanci*, Arno, *campanus* (Blanc, MS.), S. Germano, near Monte Cassino, *isseli*, Pietrasanta and Viareggio, Tuscany, *eucallistellus* = *U. pictorum* var. *parva* (Stabile), Lake of Como, *callichrous* (Letourneux, MS.), Piedmont and Danube at Belgrade, *danconæ*, Arno, *caficianus*, Syracuse, *vulgaris*, new name for *longirostris* (Stabile, *nec* Ziegl.), Tresa River, *padanus* (H. Blanc, MS.), Po at Turin, *strobeli* (Uzielli, MS.), Parma, *pedemontanus*, new name for *requieni* var. (Kobelt, Iconogr. fig. 1148), Lago

* Gurk is a locality in Carniolia, not in Italy.—Rec.

Maggiore. Aperçu sur les Unionidæ de la penins. Ital. pp. 1–62, none figured. *U. eumacrus* (Letourneux, MS.) from Croatia; Bourguignat, *id. l. c.* p. 30, footnote.

Unio veillanensis (Blanc, MS.), sp. n., Lake d'Avigliana, near Susa, Piedmont, *oriliensis* (Stabile, as var. of *requieni*), Lakes of Orilio, Lugano, &c., *larius*, new name for *robustus* (Villa, preoccupied), Lake of Como, *polii*, sp. n., Rome, *subcylindricus* (Pini, MS.), sp. n., Ticino, *fluminalis*, new name for *requieni* var. (Kobelt, Iconogr. iv. fig. 1148), River Po, *idrinus*, sp. n., Lakes of Idro and Iseo, *romanus* (Kobelt, as variety of *requieni*, fig. 1145), Tiber, &c., *etruscus*, sp. n., Pisa, *campanus* (Blanc, MS.), sp. n., Pontine Marshes, San Germano, and Naples, *meridionalis* (Pini, MS.), sp. n., Sarno River, &c., *longobardus* (Pini, MS.), sp. n., Mincio, *brianteus* (Pini, MS.), sp. n., Lake of Sartirana, *nitidus*, sp. n., Turin and Modena, *siliquatus*, sp. n., Po near Turin, *gredleri*, new name for *ovalis* var. *intercedens* (Gredler), Lake of Garda, *vulgaris* (Stabile, as var. of *U. requieni*), Lakes of Lugano, Como, and Maggiore, *benacinus*, sp. n., Lake of Garda, *minusculus*, sp. n., same locality, and 24 other already known species of Italy described, but none figured, by H. Drouet, Unionidæ de l'Italie, pp. 21–78. [There are probably some identical species in these two papers by Bourguignat and Drouet; Bourguignat's is dated July, 1883, whilst Drouet's bears no nearer statement of date than the year 1883, and is not indicated in Friedländer's "Novitates Naturæ" earlier than February, 1884.—Rec.]

Unio simonis (Tristram), *galilæi*, *pietri*, and *lorteti* (Locard, 1880), *luynesi*, *timius*, *raymondi*, *ellipsoideus*, and *prosacrus* (Bourguignat, MS.), *genezarethanus* and *tiberiadensis* (Letourneux, MS.), and *tristrami*, all from Lake Tiberias, described and figured by A. Locard, Ann. Mus. Lyon, iii. pp. 203–221, pls. xx. & xxi. He refers them to five groups, viz., those of 1, *U. rothi* (Bourg.), including *simonis* (Tristr.); 2, *raymondi*; 3, *ellipsoideus*; 4, *lorteti*, including *terminalis* (Bourg., 1852); and 5, *lunulifer* (Bourg., 1856): *l. c.* pp. 198–200. *U. anemprosthus* and *jauberti* (Bourg., MS.), *axiacus* and *subtigridis* (Letourneux, MS.), *rhomboidopsis*, *chantrii*, and *antiochanus*, spp. nn., Lake of Antioch, referred to 4 groups: 1, *simonis*; 2, *axiacus*; 3, *lorteti*; and 4, *antiochanus*, described and figured: *id. l. c.* pp. 239–250, pls. xx.–xxii.

Unio jickelii, sp. n., = *dembeæ*, Jickeli, var., Abyssinia; Bourguignat, Mal. Abyss. p. 135.

Unio hauttecœuri, *grandidieri*, *duponti*, *ruellani*, *edwardsianus*, *grantianus*, and *monceti*, spp. nn., from Lake Ukerewe, all small, with wrinkled sculpture more or less extended from the summits downwards; *id.* Moll. fluv. Nyanz. Ouker. pp. 5–16, pl., figs. 1–18.

Unio cornuum-lunæ, *auroreus*, *retiarus*, *trisulcatus*, *paschalis*, *verruculosus*, *vestitus*, *moreletianus*, *zonatus*, *murinus*, *distortus*, *mediastinus*, *abortivus*, and *pinchonianus*, spp. nn., and *cumingi* (Lea), Province of Nanking; Heude, Conchyl. Fluv. viii. fasc. Nos. 105–125, pls. lvii.–lxiv.

Unio fischerianus, sp. n., Morelet, J. de Conch. xxxi. p. 109, pl. iv. fig. 6, Cambodia [preoccupied by Lea, as *fisherianus*.—Rec.].

Unio duclerii, sp. n., A. T. de Rochebrune, Bull. Soc. Philom. (7) vii. pp. 26–31, Mekong River.

Unio beccarianus, *mattirolii*, *flyensis*, and *anodontæformis* [*-tif-*], spp. nn., Tapparone-Canefri, Ann. Mus. Genov. xix. pp. 291–296, pl. xi. figs. 2–5 and woodcuts, all from Fly River, Southern New Guinea.

Unio borealis, sp. n., Latchford, Tr. Ottawa Nat. Club, 1883, No. 3, Ottawa.

Unio cunninghami, sp. n., B. H. Wright, P. Ac. Philad. 1883, p. 58, pl. i. figs. 1–4, Lakes of Sumter Country, Florida; abstract, Am. Nat. xvii. p. 1184.

A specimen of *Unio* clasping the jaw of a snapping turtle, *Chelydra*, for between two and three days; J. E. Todd, Am. Nat. xvii. p. 428.

Austriella, g. n., J. E. Tenison-Woods, Tr. R. Soc. Vict. xvii. [1881] p. 82. Not nacreous, valves covered with concentric lamellæ. *Spatha*, Lea, is the only genus of *Unionidæ* at all near it. For *A. sordida*, sp. n., *id. l. c.* p. 83, pl., figs. 10 & 11, Bowen, Port Denison, fresh or brackish-water; largely eaten by natives.

Leguminæa (Conrad, 1865), generic name adopted by Bourguignat for the *Unionidæ* of Southern Europe and Western Asia, classified by other authors under *Monocondylæa* or *Pseudodon*, and list of the known species; *L. depressa* (C. Pfr., *Unio*), distinguished from *bonellii* (Férussac, Rossm.), both in Illyria and Lombardy, *servaini*, Pavia, *doriæ*, Vercelli and the Brianza, and *gestroi*, Province of Mantua, spp. nn.: Bourguignat, Aperçu sur les Unionidæ de la penins. Ital. pp. 62–77.

Leguminæa chantrii, Canal of the Orontes, and *bourguignati*, Lake of Antioch, spp. nn., Locard, Ann. Mus. Lyon, iii. pp. 251 & 252, pl. xix.B, figs. 8–13.

Microcondylus truncatus, sp. n., Lake of Garda, and 5 other species from Italy, described by H. Drouet, Unionidæ de l'Italie, pp. 85 & 78–84.

Pseudodon chantrii, sp. n., Locard, *l. c.* p. 254, pl. xix.B, figs. 4–7, Lake of Antioch.

Microdontia, g. n. "Testa transverse ovata, inflata; valvis lævibus, tenuibus, dentibus cardinis anticis exiguis." *M. anodontæformis* [*-tif-*], sp. n., Tapparone-Canefri, Ann. Mus. Genov. xix. p. 295, pl. xi. figs. 3–5, Fly River, New Guinea.

Margaritana margaritifera (L.), *monodonta* (Say), and *Unio sinuatus* (Lam.). Notes by Wetherby, Am. Nat. xvi. [1882] pp. 675 & 676.

Anodonta delpretii, sp. n., Bourguignat, Nat. Sicil. 1882, p. 21, and Drouet, Unionidæ de l'Italie, p. 88, Massaciuccoli, near Lucca. *A. blauneri*, new name for *atro-virens* (Shuttl., Stabile, *nec* Philippi), Lugano and Mantua, *alseria*, sp. n., Lake of Alserio, *utriculosa*, sp. n., Castelgoffredo, *anxurensis* (Statuti, MS.), sp. n., Terracina and Lake of Trasimeno, *stabilii*, sp. n., Castelgoffredo, *padana* and *pinii*, spp. nn., River Po, *longirostris*, sp. n., Tanaro, Oglio, &c., *scapulosa*, sp. n., Lake of Martignano, *romana*, sp. n., Terracina and Pontine Marshes, *leprosa* (Parr., MS.), sp. n., Pavia, Como, &c., *utinensis*, sp. n., Province of Udine, *depressa* (F. Schmidt, not described) = *blanci* (Bourg.), Lake of Avigliana, Piedmont, *anatinella* (Stabile, as *piscinalis* var.) = *idrina* (Kobelt, fig. 1756, *nec* Spinelli) = *glabra* (Stabile), Lakes of Lugano, Como, Iseo, and near Mantua, *sebini*, *ensis* (Adami, MS.), *idrina* (Kobelt, fig. 1157), Lake of Iseo, *villæ*, sp. nov. Lake of Garda, *paupercula*, sp. n., Lakes of Garda and Como, *trasymen*

[*trasim-*] (Kobelt, as *idrina* var.), Lake Trasimeno, *cristata*, sp. n., Lakes of Oggiono and Annono, and 11 known species from Italy described, none figured; H. Drouet, Unionidæ de l'Italie, pp. 88–125.

Anodonta. Critical notes on many species from Italy, and *A. doriana* and *ghiordiana* (Issel, MS.), spp. nn., both from Lake d'Alice, near Ivrea, *isseli*, *gestroi*, *beccariana*, *arturi*, and *arnouldi*, spp. nn., all near Mantua; Bourguignat, Unionidæ penins. Ital. pp. 77–117 (none figured).

Anodonta pseudodopsis, sp. n., Locard, Ann. Mus. Lyon, iii. p. 255, pl. xix.B, figs. 1–3, Lake of Antioch.

Anodonta guillaini (Recluz), Somali-land. Typical specimen figured by H. Crosse, J. de Conch. xxxi. p. 221, pl. ix. fig. 4.

Anodonta sp. from Cooper's Creek, Central Australia; Saenger, Am. Nat. xvii. p. 1184, woodcut.

Anodonta californiensis (Lea) in St. Cruz River, Arizona; A. Stearns, Am. Nat. xvii. p. 1019, woodcut.

Anodonta glauca (Val.) var. n. *sinaloensis*; Crosse & Fischer, J. de Conch. xxxi. p. 219, Province Sinaloa, Mexico.

[illegible]*tha wissmanni* and *sinuata*, spp. nn., Martens, SB. nat. Fr. 1883, adopt[illegible]ubi and Lubilash tributaries of the Congo.

Tan[illegible]*tha* (*Mutela*) *hirundo* (Martens, 1881), Quango River, figured; Bra[illegible]*ia*. Conchol. Mitth. ii. p. 139, pl. xxvii.

Burtonia, g. n. Distinguished from *Spatha* by the trigonal, subelliptical outline, a distinct dorsal keel, small compressed summits, a lamellar front part of the hinge, and an elongated ligament. *B. tanganikana* = *Spatha tanganyicensis* (E. A. Smith), P. Z. S. 1880, fig. 8, and *B. livingstoniana*, sp. n., = *S. tanganyicensis* (E. A. Smith), *l. c.* fig. 8*a*, & 1881, fig. 32, both from Lake Tanganyika; Bourguignat, Moll. fluv. Nyanz. pp. 20–23.

Cameronia (Bourg., 1879), for *Iridina spekii* (Woodw.). Distinct from *Pliodon* by the general outline, a lamellar tooth in front and a row of denticulations behind, and a long, simple ligament; *id. l. c.* pp. 19 & 20.

Ætheria. Several species, including *nilotica*, sp. n., distinguished; *id.* Hist. d. Moll., Acéphales du syst. Européen, 1880, p. 136, and Mal. Abyss. pp. 137 & 138.

Astartidæ.

Astarte semisulcata (Leach) var. *placenta* (Mörch) and var. n. *rhomboidalis*, also *A. warhami* (Hanc.); Leche, in Nordenskiöld's Vega Exped. Vetensk. Iakt. iii. pp. 441 & 442, pls. xxxii. figs. 5–12, & xxxiv. figs. 35 & 36, Northern coast of Siberia.

Parastarte (Conrad, 1862). Resembling *Astarte*; a small, rounded pallial sinus; viviparous. *P. triquetra* (Conrad) from Florida. Dall, P. U. S. Nat. Mus. vi. p. 339, pl. x. fig. 1.

Callicistronia, g. n., Dall, Science, ii., p. 447, is identical with the preceding; *id. ibid.*

Crassatella (*Eriphyla*) *lunulata* (Conrad) = *mactracea* (Linsley) from Florida; *id. l. c.* p. 340.

Cardita novangliæ (Morse); Leche, *l. c.* p. 443, pl. xxxii. figs. 13–15, Northern coast of Eastern Siberia.

Lucinidæ.

Lucina dentata (Wood, 1817) = *divaricata* (Lam., *nec* Linn.) = *chemnitzi* (Phil.) = *ornata* and *eburna* (Reeve) = *strigilla* (Stimps.) = *americana* and *pilula* (C. B. Ad.) = *lamarcki* (Dunker) = *quadrisulcata*, *sechellensis*, *ornatissima*, and *serrata* (Orb.) = *cumingi* (Ad. & Ang.), are all one species, occurring from New England to Brazil, in West and South America, East coast of Asia, Seychelles, Island of Bourbon, New Zealand, Tasmania, South Australia, Victoria, New South Wales, and North Australia; Brazier, P. Linn. Soc. N. S. W. viii. pp. 229–233 [? : Rec.].

Loripinus and *Lucinella*, gg. nn. Types, *Lucina fragilis* (Phil.) and *commutata* (Phil.). Monterosato, Nat. Sicil. 1883, p. 91. [The latter probably = *Divaricella*, Martens, 1880.]

Axinopsis orbiculata (Sars) from Labrador; K. Bush, P. U. S. Nat. Mus. vi. p. 243, pl. ix. fig. 4.

ecies;
russac,
ercelli

Kelliidæ.

Kellia suborbicularis (Mont.), littoral in Jersey; Duprey, Ann. N. H. (5) xi. p. 187.

Tridacnidæ.

Tridacna. Note on its occurrence in the Malayan Archipelago; Mohnicke, "Blicke auf des Pflanzen- und Thier-leben in den niederländischen Malayenländern"; extract in Nachr. mal. Ges. 1883, p. 189.

Cyrenidæ.

Cyrena crebricostis, sp. n., Westerlund, Nachr. mal. Ges. 1883, p. 59, Hongkong.

Cyrena viridescens, sp. n., Tapparone-Canefri, Ann. Mus. Genov. xix. p. 285, pl. x. fig. 24, Aru Islands.

Cyrena floridana (Conrad) and *carolinensis* (Lam.), Florida, in salt ponds; Dall, P. U. S. Nat. Mus. vi. pp. 338 & 339.

Batissa albertisi, sp. n., Tapparone-Canefri, *l. c.* p. 289, pl. x. fig. 1, Fly River, Southern New Guinea.

Corbicula syriaca (Bourg, MS.), sp. n., Locard, Ann. Mus. Lyon, iii. p. 228, pl. xxii. figs. 22–24, Lakes of Tiberias, Antioch, and Homs. *C. feliciana* (Bourg., MS.), new name for *orientalis* var. 2 of Lamarck, and *hebraica* (Bourg., MS.), sp. n., Lake of Antioch; *id. l. c.* pp. 257 & 259, pl. xxii. figs. 19–21 & 27–29.

Sphærium subcapense, sp. n., = *Cyclas capensis* (Jickeli, *nec* Krauss); Bourguignat, Mal. Abyss. p. 133.

Sphærium viridans (Morelet); Mazé, J. de Conch. xxxi. p. 40, pl. ii. fig. 1, Guadeloupe.

Calyculina japonica, sp. n., Westerlund, Nachr. mal. Ges. 1883, p. 58, Japan.

Eupera (Bourg., 1854) = *Limosina* (Clessin, 1872), *E. parasitica* (Parreyss) and *jickelii*, sp. n., both figured by Jickeli as *Limosina ferruginea*, Abyssinia, and *E. letourneuxi*, sp. n., Alexandria ; Bourguignat, Mal. Abyss. pp. 134 & 135.

Pisidium arcticum, *nivale*, and *glaciale*, spp. nn., Westerlund, Nachr. mal. Ges. 1883, pp. 58 & 59, Port Clarence, N.W. America.

Veneridæ.

Transennella, subg. n. of *Cytherea*. Margins on the inside obliquely grooved ; pallial sinus moderate, angular ; exterior smooth, or concentrically grooved. *Cytherea* (*T.*) *conradina*, sp. n., Dall, P. U. S. Nat. Mus. vi. p. 340, Florida.

Gouldia (C. B. Adams). W. Dall thinks that this name was originally equivalent to *Lioconcha* (Mörch), and, being of older date, should be adopted ; J. of Conch. iv. pp. 60–63 [*cf.* Zool. Rec. xix. *Moll.* p. 91].

Tapes polita [*-tus*] (Sow.) = *inflata* (H. & A. Ad.), New South Wales ; Brazier, P. Linn. Soc. N. S. W. viii. p. 234.

Saxidomus nuttalli (Conrad), woodcut ; Stearns, Bull. U. S. Fish. Comm. iii. p. 355.

Donacidæ.

Donax reevii and *sowerbii*, new names for *D. assimilis* of Reeve and of Sowerby, but not of Deshayes ; *D. dussumieri*, Malabar, *erythræensis*, Red Sea, *proximus*, Japan, *incertus*, locality unknown, spp. nn., and more exact description of *D.* (*Capsella*) *veneriformis* (Lam.) : V. Bertin, N. Arch. Mus. (2) iv. [1881] pp. 85, 98–100, 106 & 113, pl. iii. [omitted from the Zool. Rec. of that year].

Iphigenia ambigua, Central America, and *fragilis*, locality unknown, spp. nn., *id. l. c.* pp. 120 & 121, pl. iv. figs. 1–4.

Tellinidæ.

Tellina baltica (L.) is the chief food of the *Pleuronectidæ* in the Baltic ; Simmermacher, Zool. Gart. 1883, p. 37, and Nachr. mal. Ges. 1883, p. 92.

Tellina brazieri and *modesta*, spp. nn., Port Jackson, Sowerby, P. Z. S. 1883, p. 31, pl. vii. figs. 1 & 2.

DESMODONTA.

Mactridæ.

Schizothærus nuttalli (Conrad). Sketch of living animal, and proposal as to its transplantation to the East coast of North America ; Stearns, Bull. U. S. Fish. Comm. iii. p. 354.

Saxicavidæ.

Glycymeris generosa (Gould). Sketches of living animals; it sometimes attains the weight of sixteen pounds; Stearns, Bull. U. S. Fish. Comm. iii. pp. 356–360.

Anatinidæ.

Thracia jacksonensis, sp. n., Sowerby, P. Z. S. 1883, p. 30, pl. vii. fig. 5, Port Jackson.

Lyonsia arenosa var. n. *sibirica*, = *L. gibbosa* (Hancock, 1846); Leche, in Nordenskiöld's Vega Exped. Vetensk. Iakt. iii. p. 439, pl. xxxii. figs. 3 & 4, West and East coasts of Northern Siberia.

Kennerlia glacialis (Leach) from Labrador; K. Bush, P. U. S. Nat. Mus. vi. p. 245, pl. ix. fig. 1.

Myidæ.

Neæra behringensis, sp. n., Leche, *l. c.* p. 438, pl. xxxii. figs. 1 & 2; near *curta* (Jeffr.), Bering Sea, 65 fath.

Pholadidæ.

Teredo navalis. Observations made at Missolunghi; X. Nieder, Kosmos, xii. p. 304.

Teredo fuchsi, sp. n., Vassel, La Nature, No. 471, 10 June, 1882, Isthmus of Suez, Quaternary.

TUBICOLA.

H. Lacaze-Duthiers gives a very valuable anatomical description of *Aspergillum dichotomum* (Reeve), from which it appears that its fundamental structure is exactly that of the other Bivalves, and even more normal than that of *Tridacna*, *Anomia*, or the oyster, only modified by the peculiar habits and the profuse secretion of calcareous matter on the surface. The sexes are united, the ova are probably fecundated in the mantle cavity. The internal gill-leaf is double, as usual, the external simple. Arch. Z. expér. (2) i. pp. 665–732, pls. xxv.–xxix.

MOLLUSCOIDEA.

BY

PROF. EDUARD VON MARTENS, M.D., C.M.Z.S.

LIST OF PUBLICATIONS.

BARROIS, J. [See KOWALEWSKY.]

BEMMELEN, J. F. VAN. Over den bouw der Schelpen van Brachiopoden en Chitonen. Leiden: 1882 (Inaugural Dissertation).

DELLA VALLE, A. Nuove contribuzioni alla storia delle Ascidie composte di Napoli. Atti Acc. Rom. (3) x. pp. 431–498.

——. Recherches sur l'anatomie des Ascidies composées. Arch. Ital. Biol. ii. pp. 9–49, 3 pls.

——. Sur le bourgeonnement des Didemnides et des Botryllides, et sur le type entérocœlien des Ascidies. *L. c.* pp. 50–72, 3 pls.

DRASCHE, R. v. Die Synascidien der Bucht von Rovigno. Wien: 1883, 4to, 41 pp., 11 pls.

FOL, H. Sur l'œuf et ses enveloppes chez les Tuniciers. Rec. z. Suisse, i. pp. 91–160, 2 pls.

GOLDSTEIN, F. R. Y. Some New Species of *Bryozoa* from the Marion Islands, with notes on *Bicellaria grandis*. Tr. R. Soc. Vict. xviii. [1882] pp. 39–46, pls. i. & ii.

HINCKS, T. Contributions towards a General History of the Marine *Polyzoa* (continued). Ann. N. H. (5) xi. pp. 193–202, pls. vi. & vii.

——. Report on the *Polyzoa* of the Queen Charlotte Islands. *L. c.* pp. 442–451, pls. xvii. & xviii.

JOLIET, L. Blastogenèse des Salpes et Pyrosomes. C.R. xcvi. p. 1676; translated in Ann. N. H. (5) xii. pp. 70–72.

JULLIEN, J. Note sur une nouvelle division des Bryozoaires cheilostomiens. Bull. Soc. Zool. vi. [1881].

——. Bryozoaires draguées dans l'Océan atlantique en 1881. *Op. cit.* vii. [1882] pp. 497-529, pls. xiii.-xvii. [Read at the Meeting of 26th December, 1881, but not received in print at Berlin before August, 1883, and the plates have not yet been seen by the Recorder.]

KINGSLEY, J. S. Some Points in the Development of *Molgula manhattensis*. P. Bost. Soc. xxi. pp. 441–451, pl. ix.

KOROTNEFF, A. Knospung der *Anchinia*. Zool. Anz. 1883, pp. 483–487.

KOWALEWSKY, A. Observations sur le développement des Brachiopodes. Arch. Z. expér. (2) i. pp. 57–78.

——, & BARROIS, J. Matériaux pour servir à l'histoire de l'*Anchinia*. J. de l'Anat. Phys. xix. pp. 1–23, with 3 pls. [Translated in Ann. N. H. (5) xii. pp. 1–19.]

MACGILLIVRAY, P. H. Descriptions of New or Little-known *Polyzoa*. Pt. i., Tr. R. Soc. Vict. xviii. [1882] pp. 114–121, pl.; pt. ii., *op. cit.* xix. pp. 130–138, 3 pls.; pt. iii., pp. 191–194, 2 pls.; pt. iv., pp. 287–293, 2 pls.; pt. v., 10 pp., 3 pls. [distributed, and on sale, in 1883, but not contained in a published part of the Transactions].

MAPLESTONE, C. M. Observations on Living *Polyzoa*. Tr. R. Soc. Vict. xviii. [1882] pp. 48–51, pl.

QUELCH, J. J. On the Oœcium of *Spiralaria florea*. Ann. N. H. (5) xi. pp. 276 & 277.

REINHARDT, W. Otsherk stroenija i rasbitija presnowoluih mschanok. [Sketch of the structure and development of the Fresh-water *Polyzoa*.] Charkow: 1882, 7 pls.

SABATIER, A. Recherches sur l'œuf des Ascidiens. Rev. Montp. (3) ii. pp. 348–405, 4 pls.

SALENSKY, W. Neue Untersuchungen über die embryonale Entwicklung der Salpen. MT. z. Stat. Neap. iv. pp. 90–171 [1882] & 327–402, 10 pls.

SHIPLEY, A. E. On the Structure and Development of *Argiope*. MT. z. Stat. Neap. iv. pp. 494–520, pls. xxxix. & xl.

TODARO, F. Sui primi fenomeni nelle sviluppo delle Salpe. Atti Acc. Rom. Trans. vii. pp. 294–297; also in Arch. Ital. Biol. iii. pp. 361–365.

——. Sopra una nuova forma di Salpe. Atti Acc. Rom. Trans. viii. pp. 41 & 42.

TRAUSTEDT, M. P. A. Die einfachen Ascidien (*Ascidiæ simplices*) des Golfes von Neapel. MT. z. Stat. Neap. iv. pp. 448–488, pls. xxxiii.–xxxvii.

ULIANIN, B. Einige Worte über Fortpflanzung des *Doliolum* und der *Anchinia*. Zool. Anz. 1883, pp. 585–591.

BRACHIOPODA.

The researches of J. F. VAN BEMMELEN [see Zool. Rec. xix. *Moll.* pp. 97 & 99] were originally published in Dutch as an inaugural dissertation at the University of Leyden, 1882. All the investigated species,

Terebratula vitrea, *Terebratulina caput-serpentis*, *Waldheimia cranium*, and *Rhynchonella psittacea*, proved to be unisexual. No communication between the cæcal cavities in the mantle-tubules and lacunæ or vessels in the mantle itself was found; the corpuscles in these tubules seemed to be for the greater part nuclei belonging to cells that clothe the wall of the tubules; no opening in the periostracum occurred on the tops of the cæca. The lacunary system in the body-wall described by Hanley does not exist; he was misled by the aspect of the network of multipolar cells. A supra-œsophageal ganglion exists, and gives origin to arm-nerves, which are more important than those of the infra-œsophageal ganglion. In the nephridian canals, which open with funnel-shaped mouths in the body-cavity, eggs were found; they appear consequently to serve as oviducts. Abstracts in Arch. Z. expér. (2) i. pp. xxii.–xxiv.; Ann. N. H. (5) xi. pp. 379–384; and J. R. Micr. Soc. (2) iii. pp. 358–360.

The development of *Argiope* is the subject of a paper by A. E. Shipley, who first describes at length the anatomy of the adult, and especially the ovaries and the oviducts; he could not find a male specimen, but has no doubt that this genus also is diœcious. The development of the egg is described from the stage of blastosphere to that of a three-segmented red larva, armed with bristles, and about one-third mm. long; the colour is probably protective, as the larva is often fixed on red corallines. The opinions of more recent authors concerning the systematic affinity of the Brachiopods to other classes are examined by the author, who denies that the so-called segments of the larva have the value of true metameres, and thinks that they are the result of the formation of the shell from the central part of the body, and are not identical with the segments of *Sagitta* or of a Chætopod. He points out several more differences between the structure of a Brachiopod and that of either a Polyzoon or a Chætopod. MT. z. Stat. Neap. iv. pp. 494–520, pls. xxxix. & xl.

Kowalewsky publishes, in Arch. Z. expér. (2) i. pp. 57–78, a summary of his former observations concerning the development of the *Brachiopoda*, giving first a summary of the formation of the larvæ of *Argiope neapolitana*, *Thecidium mediterraneum*, and 2 species of *Terebratula*, and proceeding to discuss the more general questions as to their systematic position. He points out that the second embryonal layer, or leaf (feuillet), has its origin in *Argiope* and *Terebratula* by invagination of the first, and in *Thecidium* by peeling off (dedoublement) from it; and insists on the fundamental resemblance of the *Brachiopoda* with the *Annelides* in development, and suggests that the eminences of the subcutaneous gelatinous layer in the *Chloræmea* may be homologous to the mantle-tubes in the shell in the *Brachiopoda*. An abstract in J. R. Micr. Soc. (2) iii. p. 643.

Brest. 3 species enumerated by Daniel, J. de Conch. xxxi. p. 223.

Argiope neapolitana (Scacchi) and *cuneata* (Risso) found at Naples and described comparatively; A. E. Shipley, MT. z. Stat. Neap. iv. pp. 494–496.

Argiope capsula (Jeffr.), littoral in Jersey; Duprey, Ann. N. H. (5) xi. p. 186.

Microcosmus vulgaris (Hell.), *polymorphus* (Hell.), and *claudicans* (Sav.), Naples; *id. l. c.* pp. 475–477, pl. xxxvi. figs. 5–11, entire animals; pl. xxxvii. figs. 4–7, branchial sac.

Styela plicata (Lesueur) = *cuvieri*, and *phusca* (Delle Chiaje) = *verrucosa* (Phil.) = *gyrosa* (Hell.); *S. canopoides* (Hell.), *aggregata* (Müll.), and *rustica* (L.), Naples: *id. l. c.* pp. 477–481, pls. xxxvi. figs. 12–19, & xxxvii. figs. 8, 9, 11, & 12.

Polycarpa mayeri, sp. n., *glomerata* (Ald.), and *varians* (Hell.), Naples; *id. l. c.* pp. 481–483, pls. xxxvi. figs. 20–25, & xxxvii. figs. 10, 13, & 14.

Corella parallelogramma (Müll.), Naples; *id. l. c.* p. 452, pl. xxxiii. figs. 1 & 2, entire animal; pl. xxxiv. fig. 1, piece of branchial sac.

Ciona intestinalis (L.); *id. l. c.* p. 454, pl. xxxiii. figs. 3–5, entire animal; pl. xxxiv. fig. 2, branchial sac; pl. xxxv. figs. 1 & 2, vibratile organ.

Phallusia quadrata, oblonga, malaca, pusilla, ingeria, spp. nn., and *mamillata* (Cuv.), *mentula* (Müll.) = *monachus* (Cuv.), *muricata* (Hell.), *fumigata* (Grube), *venosa* (Müll.), *virginea* (Müll.), and *aspersa* (Müll.), the last = *prunum* (Delle Chiaje) = *cristata* (Grube) = *pustulosa* and *aculeata* (Alder), all observed at Naples, described and figured; *id. l. c.* pp. 455–468, pl. xxxiii. figs. 6–23, entire animals; pl. xxxiv. figs. 3–19, pieces of branchial sac; pl. xxxv. figs. 3–15 & 19–28, vibratile organ.

Molgula impura (Hell.), *appendiculata* (Hell.), and *occulta* (Kupff.), Naples; *id. l. c.* pp. 469–471, pls. xxxiv. figs. 20–29, & xxxv. figs. 16 & 17.

SYNASCIDIÆ.

A. Della Valle finds that the body of the Synascidians, when adult, consists, as in the true *Enterocœlia*, of two epithelial sacs, ectodermal and endodermal, separated by a cavity occupied by a true enterocœle, which opens outwards directly by the cloacal orifice; all the organs not derived directly from the endoderm, as the sexual organs, heart, and muscles, arise between the ectoderm and the parietal wall of the cœlomic sac. In the *Didemnidæ*, the gemmation of a new individual is due to the connections of two buds, which may be brothers, or mother and daughter, or grandmother and granddaughter; in the *Botryllidæ*, one bud is sufficient. Arch. Ital. Biol. ii. 1882, pp. 50–72; abstract in J. R. Micr. Soc. (2) iii. p. 196

R. v. Drasche proposes the following classification of the compound Ascidians or Synascidians:—

Fam. *Botryllidæ*. Visceral sac semilateral; testes and ovaria double, on both sides of the branchial sac; lateral gems and basal prolongations of the ectoderm; they form systems, and have a common tunica. *Botryllus* (Gärtn.), *Botrylloides* (M. Edw.).

Fam. *Perophoridæ*. Viscera at the left of the branchial sac; testes follicular around the ovarium; oviduct and vas deferens present; basal gemmation; no systems, no common tunica. *Perophora* (Wiegm.).

Fam. *Clavelinidæ*. Viscera beneath the branchial sac, genital organs within the visceral noose; testis forming a tubular net-work;

TUNICATA.

Geographical Distribution.

M. P. A. Traustedt describes 31 species of simple Ascidians observed at Naples; MT. z. Stat. Neap. iv. pp. 448–488, pls. xxxiii.–xxxvii. All figured, except *Rhodosoma callense* (Lac.-Duth.), which the author had no opportunity of observing alive. Many are identical with British and Norwegian species.

L. Roule gives a list of the *Phallusiidæ* found on the coast of Provence; C.R. xcvii. pp. 1014–1016.

R. v. Drasche has published a very valuable work on the *Synascidiæ* found at Rovigno in Istria [title, *suprà*].

ASCIDIÆ.

Abstract of Roule's paper on the anatomy and histology of *Ciona intestinalis* (L.) in J. R. Micr. Soc. (2) iii. pp. 196–198.

L. Roule has examined the hypoganglionic gland in some *Phallusiidæ*, and thinks that it has no renal function, no trace of urates being found in it, but is a mucous gland; C.R. xcvii. pp. 864–866; abstract in J. R. Micr. Soc. (2) iii. p. 830.

The development of the eggs observed in a number of Ascidians, and described by A. Sabatier, Rev. Montp. (3) ii. pp. 348–405, 4 pls.; preliminary abstract in C.R. xcvi. pp. 799–801. The same observed in some *Phallusiidæ* by L. Roule, *tom. cit.* pp. 1069–1072. Abstracts of both papers in J. R. Micr. Soc. (2) iii. pp. 356 & 497.

H. Fol discusses the origin of the cells of the follicle and the ovulum in the Ascidians; C.R. xcvi. p. 1591, and Rec. z. Suisse, i. pp. 91–160.

A. Sabatier has observed strange alterations in the eggs of some species of *Phallusia*, consisting of the presence of a yellow mass, which seems to be composed of sphærocrystals of carbonate of calcium; and he suggests that this is a senile process connected with the cease of sexual activity. Rev. Montp. (3) ii. p. 587–595; abstract in J. R. Micr. Soc. (2) iii. p. 831.

J. S. Kingsley describes the development of *Molgula manhattensis*. The larva, after hatching, is provided with a tail and develops the processes destined for attachment, the number of which is not constant, sometimes reaching ten; the whole development agrees more with that of *Ascidia ampulloides*, as described by Van Beneden, than with that of *Molgula*, described by Lacaze-Duthiers. P. Bost. Soc. xxi. pp. 441–451, pl. ix.

Herdman's observations on the individual variations in Ascidians [J. Rec. xviii. *Moll.* p. 98] are more fully published in P. Liverp. Soc. 18 12 pp., 2 pls.

Cynthia dura (Hell.), *scutellata* (Hell.), and *papillosa* (L.) = *pyriformis* (Müll.), Naples; Traustedt, MT. z. Stat. Neap. iv. pp. 472–474, pl. xxxvi. figs. 1–4, entire animals; pl. xxxvii. figs. 1–3, branchial sac.

oviduct and vas deferens present; basal gemmation; no systems. *Clavelina* (Sav.), *Diazona* (Sav.).

am. *Chondrostachyidæ*. Viscera beneath the branchial sac; testis in shape of grap-like follicles, no oviduct; the individuals are placed on a common stalk, gemmation on its free end. *Chondrostachys* (Macdon.), *Oxycorynia* (Drasche).

Fam. *Distomidæ*. Situation of viscera and genital organs as in the preceding family; basal prolongations of the ectoderm; embryonal gemmation; a common tunica. *Distoma* (Gärtn.), *Distaplia* (Della Valle).

Fam. *Polyclinidæ*. Viscera beneath the branchial sac, genital organs in a long appendage, which is traversed by a flat, tubular prolongation of the branchial sac; testes in numerous follicles along the vas deferens; oviduct ?; post-abdominal and rudimentary embryonal gemmation; forming systems; a common tunica. *Aplidium* (Sav.): post-abdomen not stalked, rectum left hand of the stomach, comprising as subgenera, *Aplidium*, *Fragarium*, *Morchellium*, *Circinalium* (all by Giard), *Amaroucium* (M. Edw.), *Synœcum* (Phipps), *Sidnyum* and *Sigillina* (Sav.). Second genus, *Polyclinum* (Sav.): post-abdomen stalked; rectum right hand of the stomach.

Fam. *Didemnidæ*. Visceral sac stalked; testis forming only one large follicle, vas deferens spirally wound around it; no oviduct; prolongations of the ectoderm, provided with muscles; intestinal gemmation, rudimentary embryonal gemmation; systems; a common tunica, mostly containing calcareous spicula. *Didemnum* (Giard), *Leptoclinum* (M. Edw.).

Fam. *Diplosomidæ*. Intestinal noose beneath the branchial sac, and nearly horizontal; testis forming two large follicles, with a broad vas deferens; no oviduct; lateral prolongations of the ectoderm, provided with muscles; intestinal gemmation and embryonal gemmation; systems; a common tunica. *Diplosoma* (Macdon.)

The author uses the term "cormus" for the whole of animals which are more or less intimately united, = colony of former authors; and "system" for the whole of animals which have a common cloaca, = "cœnobium" of Giard. He employs the terms right and left in the same sense as Milne-Edwards, and not as Lacaze-Duthiers, whose terms are based on a very doubtful comparison with the *Mollusca*. Synascidien von Rovigno, pp. 5–11.

Botryllus, subg. *Polycyclus*, *cyaneus*, sp. n., *violaceus*, sp. n. (not *B. violaceus*, M. Edw.), and *renieri* (Lam.), Rovigno, Istria; Drasche, *l. c.* pp. 13 & 14, pls. i. figs. 1 & 4, & ii. fig. 6.

Botrylloides luteum [*-us*], sp. n., *purpureum* [*-us*], sp. n., and *rubrum* [*-ber*] (M. Edw.), Istria; *id. l. c.* p. 15, pls. i. figs. 2 & 3, & ii. fig. 7.

Sarcobotrylloides, subg. n. of *Botrylloides*. Distinguished by the fleshy cormus. *S. superbum* [*-us*], sp. n., Rovigno and Pola, in Istria; *id. l. c.* pp. 8 & 14, pl. i. fig. 5.

Oxycorynia fascicularis (Drasche) [see Zool. Rec. xix. *Moll.* p. 107] described by the author; Verh. z.-b. Wien, xxxii. pp. 175–177, Hogoleu

Island, Carolines. Abstract also in Ann. N. H. (5) xi. pp. 455–457, and J. R. Micr. Soc. (2) iii. p. 498.

Distoma [*-us*] *mucosum*, sp. n., *adriaticum*, sp. n., and *crystallinum* (Renier) = *vitreum* (Sars); Drasche, *l. c.* pp. 18–21, pls. iii. figs. 14 & 16, & ix. figs. 1, 2, 5, 6, & 10, Istria.

Cystodytes, subg. n. of *Distoma* (Gärtn.). The individuals are enclosed in a calcareous capsule. *C. durus* and *cretaceus*, spp. nn., Drasche, *l. c.* pp. 9 & 18, pls. iii. figs. 13 & 15, & ix. figs. 3 & 4, Istria.

Distaplia magnilarva (Della Valle) = *Cellulophana pileata* (O. Schmidt), and *D. lubrica*, sp. n.; *id. l. c.* p. 22, pls. ii. figs. 9 & 10, vii. fig. 35, & ix. figs. 8 & 9.

Aplidium asperum and *pellucidum*, spp. nn., *id. l. c.* p. 26, pls. v. figs. 20 & 24, & x. figs. 18 & 31–33, Istria.

Circinalium concrescens (Giard) from Istria; *id. l. c.* p. 29, pls. v. fig. 23, & x. figs. 19–26.

Amaroucium conicum (Olivi, as *Alcyonium*, 1792) = *Alc. pyramidale* (Brug.) = *Policitor dipartimentatus* (Renier), the largest Synascidian, reaching 15 cm. in height and width, Adriatic; *A. commune*, *lacteum*, *subacutum*, *fuscum*, and *torquatum*, spp. nn., Istria: *id. l. c.* pp. 27–29, the first pl. vi., natural size, coloured, the others pl. v. figs. 19, 21, & 25; a single individual of the first, pl. x. figs. 27–30.

Didemnum (Giard). Emendation of generic character, only three rows of gills; *D. tortuosum*, sp. n., Trieste, *inarmatum* and *bicolor*, spp. nn., and *lobatum* (Grube), Istria: *id. l. c.* pp. 51–53, pls. vii. figs. 27, 31, & 32, & xi. figs. 34–43, 51, & 55. *D.* (by mistake *Leptoclinum*) *grubii*, new name for *Leptoclinum listerianum* (Grube, *nec* M. Edw.), from the Island Lussin, Adriatic; *id. l. c.* p. 40, footnote.

Leptoclinum coccineum, *marginatum*, *granulosum*, and *tridentatum*, spp. nn., *fulgens* (M. Edw.), *commune* (Della Valle), *candidum* (Sav.), *gelatinosum* (M. Edw.?, Giard), *aspersum* (M. Edw.), *maculatum* (M. Edw.), *dentatum* (Della Valle), and *exaratum* (Grube), all observed in Istria; *id. l. c.* pp. 33–36, pls. ii. figs. 11 & 12, iv. fig. 17, viii. figs. 36–44, & xi. figs. 44–51.

Didemnoides, subg. n. of *Leptoclinum*. Distinct by a fleshy cormus. *D. macrophorum* and *resinaceum*, spp. nn., *id. l. c.* p. 37, pls. vii. figs. 29 & 30, & xi. fig. 34, Istria.

Diptosoma. Critical notes on this genus: *Pseudodidemnum* (Giard) has been distinguished from it by misapprehension; *Astellium* (Giard) is connected with it by numerous intermediate forms; *D. pseudoleptoclinum*, *chamæleon*, and *carnosum*, spp. nn., *crystallinum* and *spongiforme* (Giard): *id. l. c.* pp. 38–41, pls. vii. figs. 28, 33, & 34, & ix. figs. 11–16, Istria.

The papers of A. Della Valle on the Synascidians mentioned *suprà* in the List of Publications have not been seen by the Recorder.

ANCHINIÆ.

Anchinia rubra (Vogt). Three fragments of zooid-bearing stolons found floating at Villafranca by A. Kowalewsky and J. Barrois. As regards structure, it is exactly intermediate between *Pyrosoma* and *Doli-*

olum. The median portion of the cloacal cavity is large, but its dimensions are still very restricted, compared with those of the pharyngeal sac; its lateral parts are likewise better marked off from the median portion than in *Doliolum*, but very much less developed than in *Pyrosoma*, and only cover a small portion of the pharyngeal sac. The branchia consists, as in *Doliolum*, of a single series of long clefts parallel to the endostyle, but is wider than in *Doliolum*, and in this respect somewhat approaches that of *Pyrosoma*. The vibratile band extends to a great distance on each side, and is united behind. The nervous ganglion gives origin to five distinct pairs of nerves. Several stages of development of the zooids are described, but even the youngest was completely separated from the stolon, and the authors think it probable that they have their origin at the end of the endostyle, as in all the other *Tunicata*, and migrate to the stolon, as in *Doliolum*. There is only one kind of zooids, none of which are specially appropriated to the functions of nutrition and respiration; all those of somewhat greater development had either perfectly formed ovaries or ramified testes filled with spermatozoids, and their organs of digestion and respiration were in complete activity. The asexual form, which may be presumed to exist and to produce the stolon, is not yet known. J. de l'Anat. Phys. xix. pp. 1–23, with 3 pls; translated in Ann. N. H. (5) xii. pp. 1–19, pls. i.–iii.; abstract in J. R. Micr. Soc. (2) iii. pp. 643 & 644.

Anchinia. A. Korotneff describes large amœboid cells found copiously in the stolon and its buds, which give origin to new individuals by division; he thinks that they are parthenogenetic eggs, and that the whole *Anchinia* is only a detached piece of an organism resembling *Doliolum*: Zool. Anz. 1883, pp. 483–487. B. Ulianin opposes this interpretation, and suggests that these cells are blood-corpuscles; *tom. cit.* pp. 585–591.

SALPÆ.

S. Trinchese gives a short note on the termination of the muscular nerves in *Salpa*; Rend. Acc. Nap. 1883, No. 3, March.

F. Todaro continues his researches on the first stages of development in *Salpa*, stating that the yelk cells are the nutritive and not the formative material of the egg; Atti Acc. Rom. Trans. vii. pp. 294–297, and Arch. Ital. Biol. iii. pp. 361–365; abstract in J. R. Micr. Soc. (2) iii. pp. 41 & 42.

W. Salensky has observed the development of several species of *Salpa*, and finds essential differences between them. In some, the egg is enveloped by a peculiar duplication of the inner wall of the respiratory cavity, which the author names "Faltenhülle" (fold-cover), and in the same species the epithelial protuberance on which the egg is placed transforms itself into the ectoderm and the placenta, the follicle, with the gonoblasts and blastomeres, giving origin to the mesodermic organs, the intestine, nervous system, and pericardial cavity; the oviduct alone appears entirely. The author calls this division *Salpæ Thecogonæ*; *S.*

pinnata, *africana*, *punctata*, and *fusiformis* belong to it. In other species, *S. Gymnogonæ*, the "Faltenhülle" is wanting and partly supplied by the epithelial protuberance; the follicle either gives origin to the placenta, as in *S. democratica*, or is transitory, that is to say, disappears wholly during the course of the development, as in *S. bicaudata*; the oviduct, however, remains for some time, either actually taking part in the formation of the embryo, *S. democratica*, or serving as an area for its formation, as in *S. bicaudata*. The chief peculiarity of the development in *Salpa* is, that the gonoblasts or cells of the follicle (which are not fecundated), not only serve as nourishment for the embryo, but also play a more important part in its construction than the blastomeres, or fecundated parts of the egg; by this circumstance, the development of *Salpa* somewhat approaches an asexual multiplication. The Gymnogonous *Salpæ* represent a more primitive grade in this mode of development, the Thecogonous a more complicated one. MT. z. Stat. Neap. iv. pp. 90–171 & 327–402, 10 pls., and woodcuts; a short recapitulation of the mentioned differences, p. 389. Abstract in J. R. Micr. Soc. (2) iii. pp. 356–358.

L. JOLIET, having examined very young solitary embryos of *Salpa democratica*, confirms and completes Kowalewsky's views on gemmation and alternation of generations, against those brought forward by Brooks and Todaro. It is true gemmation, but rendered particularly complex by the fact that organs already differentiated take part in it, the endoderm, the ectoderm, and the mesoderm of the bud being derived from the corresponding lamellæ of the parent. The solitary form is not a female, it does not contain an ovary, nor a hermaphrodite gland, but at the utmost the rudiment of such a gland, and may be therefore termed "agamic." This term may be applied to all forms which are produced sexually and possess sexual tissue in potentiality, but are incapable of conducting it to the term of its evolution; such agamic individuals are found in *Salpa*, *Pyrosoma*, *Doliolum*, and in the compound Ascidians. The lateral cords in *Salpa democratica* originate from the muscular lamellæ of the solitary embryo. C.R. xcvi. pp. 1676–1679, and Ann. N. H. (5) xii. pp. 70–72.

Salpa dolichotoma, sp. n., Todaro, Atti Acc. Rom. Trans. viii. fasc. i. p. 41, Naples.

POLYZOA.

J. JULLIEN proposes to arrange the Chilostomatous *Polyzoa* in two chief divisions :—

I. *Monodermata*. Ectocyst simple.

II. *Diplodermata*. Ectocyst consisting of two layers, the true ectocyst and the cryptocyst, which are separated by a solution of continuity (hypostegia); the orifice of the cryptocyst is called by him "opesia."

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To the former, belong *Eschara foliacea*, *Lepralia hyalina* and *coccinea*, *clausa*, *foliacea*, and *Cellepora pumicosa*; to the second, *Biflustra*, *Vincu-*

laria, several species of *Membranipora*, *Steganoporella*, and *Lunulites*, and the new family *Onychocellidæ*. Bull. Soc. Zool. vi. [1881] pp. 271–285.

Jullien, *op. cit.* vii. [1882] pp. 504 & 526, subdivides the *Chilostomata monodermata* as follows :—

1. *Subovicellata*: ovicells closed by the operculum. Fam. *Aeteidæ*, *Microporellidæ*, *Porinidæ*, and *Ascosidæ*.
2. *Superovicellata* : ovicells placed above the operculum, and furnished with a peculiar orifice. Fam. *Cellulariidæ*, *Bicellariidæ*, *Lageniporidæ*, *Schizoporellidæ*, *Myriozoidæ*, and *Escharidæ*.

C. M. Maplestone, having observed many Australian *Polyzoa* in the living state, observes that the number of the tentacles varies from eight to twenty-four, being often, but not always, a multiple of four, and notes the colour of 41 species, pink, orange, and red prevailing among them ; *Catenicella hastata* is spotted with purple or dark-green pigment cells : Tr. R. Soc. Vict. xviii. [1882] pp. 48–51.

Polyzoa collected soon after being washed up on the beach proved to be still alive ; *id. l. c.* pp. 48–51.

Symbiosis of small *Actiniæ* and a species of *Cellepora*, the former living in excavations of the substance of the latter ; W. A. Haswell, P. Linn. Soc. N. S. W. vii. p. 608.

The microscopical *Algæ* known as "yellow cells" found in *Zoobotryon pellucidum* (Ehrenb.) ; K. Brandt, MT. z. Stat. Neap. iv. p. 222.

Geographical Distribution.

Arctic Seas. Preliminary account of *Polyzoa* observed during Nordenskiöld's Expedition along the Northern coast of Asia, by A. Stuxberg, in Vega-Expeditionens Vetenskapliga Iakttagelser, i. [1882] pp. 696–715, 734, 737, 739, 740, & 787–792.

Belgian Coast. 3 species of *Polyzoa* mentioned by P. Pelseneer, Ann. Soc. mal. Belg. xvii. p. 41.

Atlantic. J. Jullien enumerates 59 species of *Bryozoa* dredged during the expedition of the French ship 'Travailleur,' in the Bay of Biscay and adjoining parts of the Atlantic in 1881 ; many new species are described and figured : Bull. Soc. Zool. vii. [1882] pp. 497–529, pls. xiii.–xvii.

Marion Islands. 5 new species of *Polyzoa* from the expedition of H.M.S. 'Challenger,' described by J. R. Goldstein, Tr. R. Soc. Vict. xviii. [1882] pp. 42–46, pls. i. & ii.

Queen Charlotte Islands. 23 species of *Polyzoa*, including many new, enumerated by T. Hincks, Ann. N. H. (5) xi. pp. 442–451, pls. xvii. & xviii.

Australia and *New Zealand.* New genera and species of *Polyzoa* ; Hincks, Ann. N. H. (5) xi. pp. 193–202, pls. vi. & vii. Victoria : many new or little-known species described and figured by P. H. MacGillivray, Tr. R. Soc. Vict. xviii. & xix. [the species of *Polyzoa* attributed in Zool. Rec. xix. *Moll.* pp. 112 & 114, to MacCoy, belongs to this author, as is stated in a letter by him.—Rec.].

CHILOSTOMATA.

Catenicellidæ.

Alysidium inornata[*-um*], sp. n., Goldstein, Tr. R. Soc. Vict. xviii. [1882] p. 42, pl. i. fig. 1, Marion Islands.

Aetiidæ.

Aetea lineata, sp. n., Jullien, Bull. Soc. Zool. vii. [1882] p. 504, pl. xiii. fig. 11, Bay of Biscay, 1094 metres.

Beania decumbens, sp. n., MacGillivray, Tr. R. Soc. Vict. xviii. [1882] p. 115, fig. 1, Port Phillip Heads.

Eucrateidæ.

Gemellaria? avicularis, sp. n., Pieper, ix. JB. Westf. Ver. [1881] p. 43, pl. ii. figs. 5–8, Adriatic.

Cellulariidæ.

Scrupocellaria obtecta (Haswell), Queensland, and *cervicornis* (Busk), Indian Seas, described by Hincks, Ann. N. H. (5) xi. pp. 193 & 194, the former pl. vi. fig. 1.

Scrupocellaria marsupiata, sp. n.; perhaps a new genus, the opercular spine entirely covering the area, and forming the under lip of the orifice; only one vibraculum: Jullien, Bull. Soc. Zool. vii. [1882] p. 506, pl. xiii. figs. 17–20, N.W. of Spain, 2018 metres.

Caberea ligata, sp. n., *id. l. c.* p. 518, pl. xvi. figs. 51–54, Bay of Biscay, 896 and 2018 metres.

Bicellariidæ.

Bicellaria evocata, sp. n., Jullien, *l. c.* p. 508, pl. xiv. figs. 21 & 22, N. of Spain, 2018 metres.

Bicellaria pectogemma, sp. n., Goldstein, Tr. R. Soc. Vict. xviii. [1882] p. 42, pl. i. fig. 2, Marion Islands. *B. grandis* (Busk): a long tubular process extending from the ovicell obliquely down, and attached by a ringed process to the tubular stem of the next cell above; *id. l. c.* p. 46.

Stirparia (Goldstein). Generic characters revised; zoœcia as in the typical *Bicellariæ*, but the celliferous branches are borne by peculiar erect stems of corneous or calcareous substance. *S. glabra*, sp. n., Western Australia. Hincks, Ann. N. H. (5) xi. p. 196, pl. vi. fig. 2.

Stolonella, g. n. Near *Beania*, but the zoœcia borne on a distinct stolon, which is regularly jointed, branched at right angles, and fixed by a special apparatus of disks developed at intervals along its course. *S. clausa*, sp. n., West Australia. Hincks, *l. c.* p. 198, pl. vii. fig. 6.

Cellariidæ.

Farcimia appendiculata, sp. n., Hincks, *l. c.* p. 199, pl. vii. fig. 4, Port Phillip Heads.

Euginoma, g. n. All zoœcia turned to the front, and disposed in longitudinal rows, hexagonal, limited by a prominent suture; orifice semicircular, without spines; ovicell formed by raising of the wall of the two following zoœcia, and divided by their sutural line into halves, its aperture above and without the orifice; dorsal face of the zoarium divided into trapezoidal faces, each formed by the dorsal wall of two zoœcia. *E. vermiformis*, sp. n., N. of Spain, 1094 and 2018 metres. Jullien, Bull. Soc. Zool. vii. [1882] p. 520, pls. xvi. fig. 57, & xvii. figs. 58 & 59.

Farciminariidæ.

Malakosaria [see Zool. Rec. xviii. *Moll.* p. 103] should be quoted as follows:—Goldstein, Tr. R. Soc. Vict. xviii. [1882] p. 43, pl. ii. fig. 4.

Elzerina (Lamx.)? = *Farciminaria*; Goldstein, *l. c.* p. 44, footnote.

Flustridæ.

Spiralaria florea (Busk). Description of the oœcia; the spines along each side of the wall are hooked; J. J. Quelch, Ann. N. H. (5) xi. pp. 276 & 277.

Membraniporidæ.

Membranipora macilenta and *tenuis*, spp. nn., Jullien, Bull. Soc. Zool. vii. [1882] pp. 521 & 522, pl. xvii. figs. 62 & 67, Bay of Biscay, 896 and 1000 metres.

Membranipora acifera, *flabellum*, *papulifera*, *albispina*, spp. nn., *serrata* and *armata* (M'G.), *polita* (Hincks), *rosseli* (Aud.)?, and *patellaria* (Moll.), Queenscliff and Port Phillip, described and figured, and a list of 29 species of this genus found in Victoria; P. H. MacGillivray, Tr. R. Soc. Vict. xviii. [1882] pp. 114–121, pl. The above *M. acifera* united with *serrata*; id. *op. cit.* xix. p. 191, pl. (i.) fig. 5.

Crepis, g. n. Zoœcia oval; area not closed completely by the ectocyst, which is chitinous and shining in front, calcareous laterally; a long thread-like prolongation on the hinder wall of the zoœcium, the tip of which is soldered to the parietal ectocyst of the preceding zoœcium; ovicells unknown. *C. longipes*, sp. n., Bay of Biscay, 1068 and 2018 metres, creeping on stones. Jullien, *l. c.* p. 522, pl. xvii. figs. 60 & 61.

Jubella, g. n. Zoœcia elongated, vaulted in front, truncate behind, limited by a thick lateral wall, which rises progressively above the cryptocyst; all zoœcia open in front and laterally; dorsal face of the zoarium divided into subrectangular faces, formed by the posterior wall of the marginal zoœcia. *J. enucleata*, sp. n., Bay of Biscay, 896 and 2018 metres. Jullien, *l. c.* p. 523.

Microporidæ.

Steganoporella smithi (Hincks) assuming the habit of a *Vincularia* on the North coast of Australia, and encrusting shells of *Tridacna* in West Australia; Goldstein, Tr. R. Soc. Vict. xviii. p. 45, footnote.

Vincularia steganoporoides, sp. n., *id. l. c.* p. 44, pl. ii. fig. 5, Marion Islands.

Onychocellidæ.

New family. Ectocyst membranaceous, cryptocyst (see *suprà*), calcareous; no marginal spines; ovicells little apparent, formed by the hollowed anterior margin of the opesia (see *suprà*); "onychocells" (vertically flattened avicularies) rather constant between the zoœcia, never on them.

Onychocella, g. n. Zoœcia hexagonal; opesia semi-elliptical or clover-shaped; onychocells large, membranaceous on one side. *O. marioni*, sp. n., South coast of France and Cape de Verde Islands, *O. antiqua* (Busk, as *Membranipora*), Madeira, on shells, and *O. luciæ*, sp. n., Isle of France, and several cretacean species.

Ogiva, g. n. Only cretacean or tertiary species.

Ogivalia, g. n. Zoœcia subhexagonal, the upper half forming a regular parabolic curve; opesia semi-elliptical, more or less elongated. To this genus, belong the recent *Vincularia elegans* (Orb.) and many cretacean species.

Floridina, g. n. Zoœcia strictly hexagonal, cryptocyst limited externally by an oval curve; opesia trifoliate; onychocells limited by four straight lines. Type, *F. antiqua* (Smith, as *Mollia*), recent at Florida, 52–80 metres.

Smittipora, g. n. Zoœcia subhexagonal, ectocyst with a semi-elliptic operculum; cryptocyst presenting three facets, one median, flat, behind the opesia, two lateral, oblique, uniting before the opesia. *S. abyssicola* (Smitt, as *Vincularia*), Cuba, 819 metres, on *Retepora*.

Jullien, Bull. Soc. Zool. vi. [1881], 15 pp., woodcuts.

Cribrilinidæ.

Cribrilina radiata (Moll.). On its varieties; Hincks, Ann. N. H. (5) xi. p. 412.

Cribrilina alcicornis, sp. n., Jullien, Bull. Soc. Zool. vii. [1882] p. 508, pl. xiv. figs. 23–25, Atlantic, N.W. of Spain, 1068 & 2018 metres.

Cribrilina setirostris, sp. n., MacGillivray, Tr. R. Soc. Vict. xix. p. 191, pl. (ii.) fig. 3, Port Phillip Heads.

Membraniporella distans, sp. n., *id. l. c.* p. 130, pl. (i.) fig. 5, Port Phillip Heads.

Microporellidæ.

Microporella insperata, sp. n., Jullien, *l. c.* p. 505, pl. xiii. fig. 12, N.W. of Spain, 2018 metres.

Microporella ciliata varr. nn. *vibraculifera*, *umbonata*, and *californica*, the last = *Lepralia californica* (Busk), all from Queen Charlotte Islands; Hincks, Ann. N. H. (5) xi. pp. 443 & 444, pl. xvii. figs. 1–3.

Microporella renipuncta, sp. n., *stellata* (Smitt), and *malusii* var. n. *personata*, all from Port Phillip Heads; MacGillivray, *l. c.* pp. 130 & 131, pls. (i.) figs. 1 & 4, & (ii.) fig. 8.

Monoporella brunnea, sp. n., Hincks, Ann. N. H. (5) xi. p. 444, Queen Charlotte Islands.

Ascosia, g. n. Zoœcia erect, united only at the base, orifice longitudinally oval, cut obliquely on the top of the zoœcium, surrounded by a flattened border; ovicell globular, hood-shaped; one or two vibracula on the sides of the orifice; dorsal area of the zoœcium formed by the vaulted background of the zoœcia, which are separated by furrows. *A. pandora*, sp. n., externally somewhat resembling *Multescharipora francquana* (Orb.), N.W. of Spain, 2018 metres. Jullien, Bull. Soc. Zool. vii. [1882] p. 505, pl. xiii. figs. 13 & 14.

Lageniporidæ.

Temachia, g. n. Zoœcia suberect, dilatated below and narrowed above; peristome cleft in front and without spines; ovicell globular, its orifice corresponding to the cleft of the peristome; first zoœcium with entire and cancellated frontal wall, with two strong lateral spines on the level of the orifice. *T. opulenta*, sp. n., N. of Portugal, 2068 metres. Jullien, *l. c.* p. 509, pl. xiv. figs. 26–29.

Lagenipora edwardsi, sp. n., *id. l. c.* p. 510, pl. xiv. figs. 30 & 31, N.W. of Spain, 1068 & 2018 metres.

Lagenipora tuberculata, sp. n., MacGillivray, Tr. R. Soc. Vict. xix. p. 132, pl. (iii.) fig. 15, Port Phillip Heads.

Tegminula, g. n. Zoœcia urceolate, irregularly erect; orifice entirely circular with tubular peristome, which is partly open in front. *T. venusta*, sp. n., Bay of Biscay, 392 metres. Jullien, *l. c.* p. 510, pl. xvii. figs. 68 & 69.

Myriozoidæ.

Schizoporella fischeri, *neptuni*, *obsoleta*, and *ovum*, spp. nn., Jullien, *l. c.* pp. 511–513, pls. xiv. figs. 32–34, & xv. figs. 35–37, Bay of Biscay, 392–1068 metres.

Schizoporella crassilabris, *crassirostris*, *longirostrata*, *insculpta*, *tumulosa*, *pristina*, *maculosa*, and *dawsoni*, spp. nn., and *auriculata* (Hassall) var. *ochracea* (Hincks), all from Queen Charlotte Islands; Hincks, Ann. N. H. (5) xi. pp. 445–449, pls. xvii. figs. 4–6, & xviii. figs. 1–3 & 5.

Schizoporella lata, *insignis*, *punctigera*, *ridleyi*, and *arachnoides*, spp. nn., MacGillivray, Tr. R. Soc. Vict. xix. pp. 132 & 133, pls. (i.) fig. 7, (ii.) fig. 11, & (iii.) fig. 13, and pp. 191 & 192, pl. (i.) figs. 1 & 4, Port Phillip Heads.

Schizoporella cinctopora, sp. n., Hincks, Ann. N. H. (5) xi. p. 200, pl. vii. fig. 3, New Zealand.

He *chizotheca fissurella*, sp. n., Hincks, *l. c.* p. 449, pl. xvii. fig. 7, Queen Charlotte Islands.

Rhynchopora profunda, sp. n., MacGillivray, *l. c.* p. 192, pl. (ii.) fig. 8, Port Phillip Heads.

Escharidæ.

Lepralia polygonia, sp. n., Jullien, Bull. Soc. Zool. vii. [1882] p. 513, pl. xv. fig. 38, N. of Portugal, 1068 metres.

Lepralia setigera (Smitt), *magnirostris*, sp. n., *striatula* (Smitt), and *longipora*, sp. n. ; MacGillivray, *l. c.* pp. 133–135, pls. (i.) figs. 2, 3, & 6, & (iii.) figs. 17 & 18, Port Phillip Heads.

Lepralia foraminigera and *rectilineata*, spp. nn., Hincks, *l. c.* pp. 200 & 201, pl. vii. figs. 1 & 5, New Zealand.

Porella marsupium, sp. n., MacGillivray, *l. c.* p. ?, pl. (i.) fig. 2, Port Phillip Heads.

Fedora, g. n. Zoœcia subhexagonal ; orifice thick but not prominent, circular and notched behind, placed nearly in the centre of the zoœcium ; ovicell not prominent, externally indicated by a smooth angular band, its orifice large and provided with a calcareous lamella ; avicularia not always present, situated on the sides and outside of the orifice. *F. edwardsi*, sp. n., Bay of Biscay, 2018 metres. Jullien, Bull. Soc. Zool. vii. [1882] p. 514.

Smittia vaginа, spectrum, miniacea, and *perrieri*, spp. nn., *id. l. c.* pp. 514 & 515, pls. xv. figs. 41 & 42, & xvi. figs. 43–45, Bay of Biscay, 1000–2018 metres.

Smittia oculata, sp. n., and *reticulata* var. n. *spathulata* ; MacGillivray, *l. c.* p. 135, pls. (ii.) fig. 12, & (iii.) fig. 13, Port Phillip Heads.

Mucronella longicornis, sp. n., very near *abyssicola* (Norman, *Lepralia*), first zoœcium with a large orifice, provided with eleven spines, Jullien, *l. c.* p. 516, pl. xvi. figs. 46 & 47, N. of Portugal, 1068 metres.

Mucronella munita and *serratula*, Port Phillip Heads, *levis*, Sorrento, Victoria, spp. nn., MacGillivray, *l. c.* pp. 136 & 137, pls. (ii.) figs. 9 & 10, & (iii.) fig. 16.

Mucronella bicuspis, sp. n., Hincks, Ann. N. H. (5) xi. p. 201, pl. vii. fig. 2, New Zealand.

Palmicellaria inermis, sp. n., Jullien, *l. c.* p. 517, pl. xvi. fig. 48, N.W. of Spain, 2018 metres.

Celleporidæ.

Cellepora exigua (MacGill., 1860) probably = *Rhynchopora bispinosa*; MacGillivray, *l. c.* p. 192, pl. (ii.) fig. 7.

Sphæropora (Haswell) is probably a *Cellepora*, with excavations caused by minute Actinids ; Haswell, P. Linn. Soc. N. S. W. vii. p. 609 (cf. *suprà*).

Lekuthopora, afterwards corrected to *Lekythopora* [*Lecy-*], g. n. Polyzoary erect, branched ; cells arranged round the branches, more or less flask-shaped or elongated, oblique or erect, and crowded together ; mouth irregularly rounded ; peristome thickened and becoming produced into

a long tube, on one side of the orifice of which is a small avicularium, the ovicell forming a projection on the side of the cell below the mouth, ...ads; summit deficient in calcareous matter, and formed by an oval lens-sha... membrane. *L. hystrix*, sp. n., Port Phillip Heads, Victoria. MacGi...*per*-vray, Tr. R. Soc. Vict. xix. p. 193, pl. (ii.) fig. 6.

Reteporidæ.

Retepora arborea, sp. n., Jullien, *l. c.* p. 517, pl. xvi. figs. 49 & 50, Bay of Biscay, 896 & 2018 metres.

Retepora serrata, *aurantiaca*, *avicularia*, spp. nn., *porcellana* (MacGill., 1869) = *robusta* (Hincks, 1878), *granulata* and *fissa* (MacGill., 1869), all described and figured; MacGillivray, *l. c.* pp. 287–291, pl. (ii.) figs. 4–10, Port Phillip Heads. *R. monilifera* (MacGill., 1860), with varr. nn. *sinuata*, *umbonata* and *munita*, and *R. formosa* and *carinata*, spp. nn., and notes on *R. fissa*, with a list of 11 Victorian species of this genus, by the same, in Pt. v. of his Descriptions of New or Little-known *Polyzoa*, 10 pp., 2 pls.

CYCLOSTOMATA.

Crisiidæ.

Anguisia, g. n. Zoarium not articulated; zoœcia tubular, punctate; zoœcial budding on the most convex part; ovicells vesicular, with a prominent orifice in front. *A. verrucosa*, sp. n., Biscayan Sea and Mediterranean, 555–2018 metres. Jullien, Bull. Soc. Zool. vii. [1882]p. 498, pl. xi. figs. 1 & 2.

Tuburiporidæ.

Stomatopora calypsoides and *gingrina*, spp. nn., Jullien, *l. c.* p. 498, N. of Portugal, 1068 metres, the former figured pl. xiii. fig. 3.

Crisina crassipes, sp. n., *id. l. c.* p. 499, pl. xiii. fig. 4, N.W. of Spain, 2018 metres.

Idmonea insolita, sp. n., *id. l. c.* p. 499, pl. xiii. figs. 5 & 6, N. of Portugal, 1068 metres.

Tervia, g. n. Distinct from *Idmonea* by the presence of a certain number of isolated zoœcia, disposed without order in the middle of the branches between the lateral rows. *T. superba*, *discreta*, *folini*, and *solita*, Bay of Biscay, 392–2651 metres. *I. irregularis* (Meneghini) also belongs to this genus. *Id. l. c.* pp. 500 & 501, pls. xvii. figs. 70–75, & xiii. figs. 8 & 9.

Diastopora inædificata, sp. n., N. of Portugal, 1068 metres: proliferating from the centre of the zoœcium; all zoœcia closed by a calcareous septum after the death of the polypid, but in some the tube is elongated beyond this septum, and probably contains a new polypid. *Id. l. c.* pp. 502 & 503, pl. xiii. fig. 7.

Pustulopora regularis, sp. n., MacGillivray, Tr. R. Soc. Vict. xix. p. 292, pl. (i.) fig. 3, Port Phillip Heads.

Reticulipora intricaria (Smitt) common in the northern part of the east coast of Novaya Zemlya, 40–125 fath.; Stuxberg, in Vega Exped. Vet. Iakt. i. p. 750.

Horneridæ.

Hornera rugosula, sp. n., Jullien, Bull. Soc. Zool. vii. [1882] p. 502, pl. xiii. figs. 9 & 10, Atlantic, N. of Spain, 2018 metres.

Hornera subdubia, sp. n., Goldstein, Tr. R. Soc. Vict. xviii. [1882] p. 45, pl. ii. figs. 6–8, Marion Islands.

Hornera robusta, sp. n., MacGillivray, *op. cit.* xix. p. 291, pl. (i.) fig. 1, Port Phillip Heads.

Lichenoporidæ.

Discoporella clypeiformis (Smitt), specimen from the Bay of Biscay, 391 metres, described; Jullien, *l. c.* p. 503.

Cerioporidæ.

Fasciculipora gracilis, sp. n., MacGillivray, *l. c.* p. 292, pl. (i.) fig. 2, Port Phillip Heads.

CTENOSTOMATA.

Alcyonidiidæ.

Alcyonidium mammillatum (Alder) common in some parts of the Siberian glacial sea; Stuxberg, in Vega Exped. Vet. Iakt. i. p. 754.

Vesiculariidæ.

Setosella vulnerata. Ovicells only found in a depth of 1068 metres; Alph. Milne-Edwards, Arch. Miss. Sci. ix. [1882].

Setosella folini, sp. n., Jullien, *l. c.* p. 523, pl. xvii. figs. 63–65, N. of Spain, 896 metres.

LOPHOPODA.

On the structure and development of the fresh-water *Polyzoa*; W. Reinhardt [title, *suprà*].

Plumatella repens (L.) and *Fredericella sultana* (Blumenb.) found in Australia by T. Whitelegge; Abstract of P. Linn. Soc. N. S. W., May, June, and September, 1883.

CRUSTACEA.

BY

PROF. EDUARD VON MARTENS, M.D., C.M.Z.S.

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Studer, T. Verzeichniss der während der Reise S.M.S. 'Gazelle' an der Westküste von Afrika, Ascension, und dem Cap der guten Hoffnung gesammelten Crustaceen. Abh. Ak. Berlin, 1882 [published 1883]; 32 pp., 2 pls.

General Morphology.

J. S. Kingsley discusses the resemblances and differences between the *Crustacea* and *Insecta*, and suggests a distinct Crustacean Phylum, to be derived from the *Nauplius* form, whereas the *Insecta* are to be derived from a form like *Peripatus*; Am. Nat. xvii. pp. 1034–1037.

The general anatomy of *Canthocamptus* and *Gammarus* is given in C. L. Herrick's "Types of Animal Life selected for Laboratory Use in Inland Districts."

C. L. Herrick states that in *Cyclops* "it is no uncommon thing to see females of less than half the size of the adult with ova sacs, and it is common to meet larvæ, in which the antennæ are as yet composed of but few joints, in similar condition." He suggests that, under certain circumstances, some individuals reach a larger size than ordinarily, and undergo a certain amount of alteration, or rather "intensifying," of their specific characters; this state is called by him "post-imago." So *C. signatus* = *coronatus* (Claus) is, according to him, a post-imago of *C. tenuicornis*. The same is to be found in the genus *Diaptomus*. Am. Nat. xvii. pp. 208–211.

1. *Nervous System and Organs of Sense.*

W. Vignal gives a general description of the anatomical arrangement and microscopical structure of the central parts of the nervous system in the Decapod *Crustacea*, chiefly from observations made in *Homarus vulgaris*, *Palinurus vulgaris*, *Astacus fluviatilis*, *Palæmon serratus*,

Carcinus mœnas, *Maia squinado*, and *Platycarcinus pagurus*. All ganglion-cells in the cerebroid, thoracic, and abdominal ganglions are unipolar. Arch. Z. expér. (2) i. pp. 303–325 & 288, pl. xv.*

The very complex sympathetic nervous system of the Isopods described by L. Huet, J. de l'Anat. Phys. xix. pp. 241–376, 4 pls.

Cardiacal nerve originating from the cerebroid ganglion in *Palinurus* described by F. Mocquard, Bull. Soc. Philom. (7) vii. pp. 55–59.

Supposed auditory vesicle in the fourth joint of the gnathopods in the male of *Tanais*; H. Blanc, Zool. Anz. 1883, p. 635.

Eyes of *Limulus*. [See *infrà*, in the special part.]

F. Leydig describes the rudimentary eyes of *Cambarus pellucidus* (Tellk.), in which no pigment or nervous rods (bacilli) and cones could be found, and the well-developed olfactory cones and sensitive hairs in both antennæ of the same, with some critical observations on the sensitive hairs, &c., of other *Crustacea*, in "Untersuchungen zur Anatomie und Histologie der Thiere," Bonn: 1883, 8vo, pp. 36–44, pl. iii. fig. 27.

The membranaceous cups or calceoli on the antennæ of some Amphipods are described by H. Blanc: they are isolated in the males of *Gammarus locusta* and *pulex*, but grouped together in both sexes of *Calliopius laviusculus* and *Amathilla sabinii*; as they are most developed in littoral or pelagic species, the author suggests that they may serve the function of hearing. Zool. Anz. 1883, pp. 370–372.

2. *Organs of Digestion.*

Large salivary glands found not only in the terrestrial *Isopoda*, but also in the *Idoteidæ* and *Cymothoidæ*; L. Huet, J. de l'Anat. Phys. xix. p. 241.

J. Frenzel has examined the so-called liver of various Decapod and Stomapod *Crustacea*; he distinguishes in it—(1) Grease-cells (Fettzellen), which are the liver-cells of Weber [see Zool. Rec. xvii. *Crust.* p. 8], and serve for the secretion of grease (fat), but do not contain biliary acids or biliary ferments; (2) Ferment cells, containing a granulous brown matter which is eventually extracted during passage through the intestine, and often also crystals of tyrosine. As the chemical effect of both is not that of the gall in the *Vertebrata*, the author proposes to call this gland not liver, but middle-gut gland, or gland of the middle intestine (mittel-darm-drüse). SB. Ak. Berlin, 1883, pp. 1113–1119.

The same author treats of the same subject, extending his observations to various genera of *Brachyura*, *Macrura*, and *Isopoda*, and suggesting that the function of this organ may be analogous to that of the pancreas in the Vertebrates; MT. z. Stat. Neap. v. pp. 50–101, pl. iv.

F. Albert describes at length the hard parts of the stomach of a considerable number of Macrurous and Anomurous *Decapoda*. He corroborates generally the observations made on this subject by Boas [Zool. Rec. xvii. *Crust.* p. 16], and comes to the conclusion that these parts, although not yielding valuable matter for the distinction of species, are very important for the systematization of higher groups; the *Sergestidæ*, for example, are proved by them to belong to the *Penæidæ*, as both have a dorsal

cardiacal part, which is absent in all *Eucyphota*. *Porcellana* belongs in this respect to the *Galateidæ*, and *Lithodes* to the *Paguridæ*. Also the *Squillidæ*, *Mysidæ*, and *Cumacea* have typically homologous parts; the middle infero-median piece of the pyloric part has one row of bristles in *Diastylis*, two in *Mysis*, three in *Gammarus*, and numerous ones in the higher *Malacostraca*, their number increasing remarkably with the higher systematical position of the individual forms. Z. wiss. Zool. xxxix. pp. 444–536, pls. xxix.–xxxi.

F. Mocquard begins a detailed paper on the stomach of the Podophthalmous *Crustacea*, giving first the literature of the subject, and then passing to the description of that of the *Brachyura* generally, and especially that of 12 species of *Cyclometopa*, 17 *Catometopa*, 6 *Oxyrrhyncha*, 6 *Oligorrhyncha* (*Calappidæ*, *Corystidæ*, *Dorippidæ*), 2 *Microcephala* (*Leucosiidæ*), 1 *Dromia*, 1 *Homola*, and 1 *Ranina*. Among the *Macrura*, is described that of 3 *Hippidæ*, 8 *Lithodidæ* and *Paguridæ*, 4 *Porcellanidæ* (including *Æglea*), 4 *Galateidæ*, 4 *Palinuridæ* (including *Scyllarus*), 1 Eryonid (*Pentacheles validus*), 2 *Thalassinidæ*, 5 *Astacidæ*, 17 *Penæidæ*, and 1 *Pasiphæa*. Ann. Sci. Nat. (6) xvi. Nos. 1–3, Art. 1, 188 pp. (not yet finished).

3. *Circulation and Respiration.*

C. Claus makes some observations on the circulatory organs of the *Stomatopoda*: he describes the heart in the larval stages of *Alima* and *Erichthus*; points out that the whole system of cerebral vessels may be regarded as a large vascular loop, analogous to the more simple vascular loops in the ganglia of the ventral chain; and states the existence of a large median ventral artery in this Order of *Crustacea*. Arb. Inst. Würzb. v. pp. 1–12, 3 pls.

Yves Delages describes at length the organs of circulation in *Mysis*, stating that they are arranged on the same general plan as in the *Decapoda*, but in a lower degree of perfection, the vascular circulation being interrupted by considerable lacunæ, and the arterial blood not being throughout separated from the venous. Respiration is seated, according to him, in the vessels in the dorsal shield, and he thinks it is the same also in the larvæ of the *Decapoda* before the development of gills. Arch. Z. expér. (2) i. pp. 105–130, pl. x.

Hæmoglobin in the blood of *Apus*, and probably also of *Daphnia* and *Cypris*; P. Regnard & R. Blanchard, Zool. Anz. 1883, pp. 253–255. E. R. Lankester states that he found it in 1869 in *Daphnia* and *Chirocephalus*; tom. cit. p. 416.

4. *Organs of Generation.*

H. Friedrich describes the genital organs and propagation of the *Oniscidæ*; he agrees in many points with the statements made by J. Schöbl, 1879 [Zool. Rec xvi. *Crust.* p. 38]. The cœcal appendages of the testicles are, according to him, the homologues of the ovary in the male

sex; the vasa deferentia are provided with small cleft-like openings outside, and these are connected by a small channel placed on the lateral plates, with the true intromittent organs (appendages of the second abdominal segment). Copulation takes place in April and May, and the female orifices are closed by the next moult, before the spermatozoids have proceeded from the receptaculum seminis to the oviduct; the fecundated eggs break afterwards through the faint walls of the oviduct into the abdominal cavity, and by a special median cleft to the outside between the breeding lamellæ, where they receive nourishment from four peg-like prolongations of the abdominal integument on the second, third, fourth, and fifth segments, which have been very properly termed cotyledons by Treviranus. The breeding lamellæ are formed earlier beneath the skin, and come free at a subsequent moult. Fecundation in spring suffices for the summer, and before winter the female orifices are reopened by a further moult. There are, accordingly, two sexual periods each year in the females, one with open orifices in winter and spring, and one with closed orifices and developed cotyledons, destined for the further development of the eggs, in summer. Z. ges. Naturw. (4) ii. pp. 447–474, pl. v.

De la Valette describes the genital organs of both sexes of *Oniscus murarius* (Cuv.) [*asellus* (L.)] and some species of *Porcellio*, the structure of the eggs, and the formation of the spermatozoids; he mentions former authors on this subject, and in the main confirms the views of J. Schöbl [Zool. Rec. xvi. *Crust.* p. 38], adding that the eggs are not ejected by the so-called oviduct of authors, which is to be called vagina, but that they become free by the spontaneous destruction of that part of the ovary which contains the mature eggs. "De Isopodibus," Programm of the University of Bonn, Aug. 1883, with 2 pls.

On Spermatogenesis in the Ediophthalm *Crustacea*; G. Hermann, C.R. xcvii. pp. 1009–1012.

5. *Development.*

Abstract of Brooks's paper on the metamorphosis of *Peneus* in J. Hopkins Univ. Circ. No. 19, 1882, and Ann. N. H. (5) xi. pp 147–149. W. Faxon makes some critical remarks on this paper; Am. Nat. xvii. p. 554.

E. A. Birge describes the development of *Panopæus sayi* (Smith), distinguishing and figuring the following stages:—

First Zoea, still in larval skin.

Second Zoea, moulted from larval skin, four swimming hairs, long dorsal and frontal spines, long antennæ.

Third Zoea, six swimming hairs, first appearance of abdominal legs under skin, long spine on fifth abdominal segment.

Fourth (or later) Zoea, eight or more swimming hairs, external abdominal legs, spines on anterior abdominal segments.

Last Zoea, twelve or more swimming hairs, divided telson, mandibular palpus.

First Megalops, immediately after moult from last Zoea, all long

spines entirely lost, telson a simple plate, carapace vertically flattened, all appendages profoundly modified.

First Crab Stage, three teeth on each side of carapace, anchylosed segment for fifth walking leg.

Further, he follows each appendage, from the eye and antennula to the abdominal appendages, from their first appearance until their last transformation. It was impossible to raise any one crab from the egg to the adult stage; specimens were raised from the egg to the second Zoea stage, and the moults observed from stage to stage throughout. As, however, many moults do not alter the form of the Zoea, the number of them could not be determined exactly. Stub. Biol. Lab. Johns Hopkins Univ. ii. No. 4, pp. 411–426, pls. xxx.–xxxiii.

W. K. BROOKS has very successfully studied the development of *Lucifer*, concerning which only a few suggestions by the late R. von Willemöes-Suhm have been recorded. He describes first the genital organs of the adult, then the eggs and their segmentation, which is simplified by the restriction of the food-material to a single one of the cells of the segmenting egg; this the author thinks to be a secondary change, not a primitive feature. The larva is hatched in the form of Nauplius, and passes thence successively through a second Nauplius or Meta-nauplius stage, preparatory to the following:—Three Proto-zoea stages, the third of which is Dana's *Erichthina*, a Zoea stage, corresponding to the *Elaphocaris* form of *Sergestes*, and three Schizopod stages, the first of which corresponds to the *Acanthosoma*, the third to the *Mastigopus* stages of *Sergestes*, before reaching the adult form. In the last, the male is one step more advanced than the female. All these stages are fully described and figured, and the development of the single pairs of appendages is followed through all. The Proto-zoea and Zoea forms make an unbroken series, but there is a remarkable change in profound structural points between the Meta-nauplius and the first Proto-zoea, and between the Zoea and the Schizopod form. Neglecting the features which, at the end of each stage, make their appearance as preparation for the next, the author characterizes these more important steps of development as follows (p. 91):—

1. Nauplius. Three pairs of locomotor appendages, both pairs of antennæ and mandibles; a large labrum without a spine; carapace and telson absent; an ocellus, no compound eye.
2. Proto-zoea. Antennæ as in Nauplius; mandible reduced to a cutting plate; two pairs of biramous maxillæ, with scaphognathites and two pairs of biramous maxillipeds; hind body long, with a flat telson; labrum with a spine; carapace large, with a rostrum, a median dorsal and two lateral posterior spines, its free edges reach down beyond the basal joints of the appendages. An ocellus, no stalked eye. In this and in the preceding stage, locomotion consists of short jerking leaps, as in many *Entomostraca*, the two pairs of antennæ being the chief organs employed.
3. Schizopod stages. Both pairs of antennæ reduced to the permanent form; all the mouth parts and four pairs of thoracic

limbs present, all posterior to the first pair of maxillipeds biramous and locomotor; six abdominal somites and a movable telson; the swimmerets present, but the other abdominal appendages not. Ocellus and stalked eye present. Carapace with rostrum and two antero-lateral spines; labrum with spine, body flattened vertically.

4. The young *Lucifer* and the adult female have a long flagellum on the first antennæ, a flagellum and scale on the second; ear and antennary gland present; neck elongated. The fourth periopod has disappeared, the others, as well as the maxillipeds, have lost their exopodites. All pleopods two-branched, except the first pair; telson straight; exopodite of the swimmerets rounded.
5. The adult male has a clasping organ on the first periopod, three rami on the second, two teeth on the lower edge of the sixth abdominal somite, a square end to the exopodite of the swimmeret, and a bent telson.

The author further describes the development of an allied larva, belonging very probably to the genus *Acetes*, from the Zoea stage to the Schizopod form; its last Zoea stage differs from that of *Lucifer* by a stalked eye, the two-jointed shaft of the first antenna, four rings in the endopodite of the second antenna, two lobes in the metastoma, spiny somites and a deeply-forked telson; the Schizopod stage differs by the appendage of the fourth thoracic segment being represented only by an exopodite, the exopodites of the periopods being covered by a cuticle, and functionless, and by the presence of three pairs of abdominal appendages beneath the swimmerets. *Lucifer* keeps all its Schizopod limbs for at least two more moults; *Acetes* loses its exopodites at once, and its maxillipeds, thoracic limbs, and antennæ become like those of an adult Sergestid some time before the appearance of the five pairs of pleopods, and these do not appear together, but in two sets. The result of the process of development is nearly alike, but the paths followed diverge from each other, to converge again at the last stage. The author further compares the statements on the development of *Sergestes*, *Euphausia*, and *Penæus* by Dohrn, Claus, F. Müller, and Metschnikoff with his own observations, and comes to the conclusions that the Nauplius form is really most ancestral, that the Phyllopods and the highest *Brachyura* are connected by a tolerably complete series of intermediate forms, and that this graduation consists of an increased dependence of the various parts on each other, and increased prominence of the general individuality over the individuality of the somites or metameres. Phil. Tr. clxxiii. [1882] pp. 57–137, pls. i.–xi.; previous abstract in P. R. Soc. xxxii. pp. 46–48.

6. *Moulting.*

F. Mocquard states that the arcades formed by mesophragms and the longitudinal branches connected with them are softened and finally broken in the moulting of the spiny lobster; C.R. xcvi. pp. 204 & 205, also J. R. Micr. Soc. (2) iii. p. 211.

Moulting of *Limulus*. [See *infrà*, in the special part.]

7. *Biology.*

E. GRÄFFE has observed that some *Crustacea* cover themselves with algæ, sponges, &c., by the aid of hook-shaped hairs on their body; [illegible] Soc. Adr. pt. 1, 2 pls. C. P. SLUITER states that he has seen and described the same in 1880 in a species of *Chorinus* (Nat. Tijdschr. Nederl. Ind. xi. p. 159); Zool. Anz. 1883, p. 99.

Note on the sickness of crayfishes in the Mietzel, Mark Brandenburg, by MAX VON DEM BORNE, Circular des deutschen Fischereivereins, 1883, No. 5, pp. 147 & 215. LINSTOW has found a large number of small oval cells, about 0.02 mm. long and 0.013 broad, in all the organs of the diseased crayfishes; *op. cit.* p. 216.

F. HILGENDORF states that he could not find any *Distoma* in diseased crayfishes [*cf.* Zool. Rec. xviii. *Crust.* p. 20], and calls attention to two other parasites of the common crayfish, *Psorospermium haeckeli*, sp. n., and *Branchiobdella*; the latter appears to bite off the tips of the gill filaments: SB. nat. Fr. 1883, pp. 179–183.

Parasitic worms, *Nematodes* and *Trematodes*, observed in some Copepods and *Cladocera*; Herrick, Am. Nat. xvii. pp. 386 & 387.

8. *Abnormities.*

Multiplication of the claws in the common crayfish, *Astacus fluviatilis*; E. CANTONI, Rend. Ist. Lomb. (2) xvi. pp. 771–776.

GEOGRAPHICAL DISTRIBUTION.

1. *Land and Fresh-water Crustacea.*

F. T. KÖPPEN's paper on the distribution of some species of crayfish in Russia; see infrà, *Astacus*.

Several fresh-water *Cymothoidæ* from the East Indies and Brazil described by Schiödte & Meinert; see in the special part.

The occurrence of *Apus* and *Estheria* in small pools without communication with other waters, the former at Fontainebleau and other localities in Northern France, the latter in Algeria, is mentioned by C. E. LEPRIEUR & E. SIMON, Ann. Soc. Ent. Fr. (6) iii. pp. cxiv. & cxv.

List of 24 species of *Cladocera* found in the Lake district, and description of 3 new to England; C. BECK, J. R. Micr. Soc. (2) iii. pp. 777–784, pls. xi. & xii.

P. PAVESI continues his researches upon the small *Crustacea* in the depths of the lakes in Italy. He describes and figures the little net, loaded by weights, which he uses for this purpose, enumerates all the lakes searched, and gives a systematic list of 29 species, 18 *Cladocera*, 2 *Ostracoda*, and 9 *Copepoda*, with their geographical distribution, especially mentioning the lakes and depths in which he has observed them; finally, he adds some general considerations corroborating (against Forel) his opinion that the truly pelagic forms have continued to exist in these lakes from old times, when the lakes were inlets of the sea before the

glacial epoch. The plates represent the 9 principal forms of pelagic *Crustacea*, and geographical sketches of thirty-two lakes, with indication of the species found in them by different colours. *Daphnia kahlbergensis* (Schödl.) and *Alona quadrangularis* (Müll.) are new for Italy. Atti Soc. Ven.-Trent. viii. pt. 2, pp. 340–403, pls. viii.–xiv.

Lakes Bourget and *Annecy*, in Savoy. Several *Cladocera* found by O. E. Imhof, Zool. Anz. 1883, pp. 655–657.

A. S. Packard has published a very valuable monograph of the North American *Phyllopoda*, containing also lists of known species from other countries, and a zoogeographical map [title, *suprà*].

Valuable notes on the occurrence of many Copepods and *Cladocera* in North America, incidentally mentioned by C. L. Herrick, Am. Nat. xvii. pp. 208–211, 381–388, & 499–505. The existence of the European *Diaptomus castor* (Müll.) and *Cyclops serratulus* (Claus) in North America stated; *id. l. c.* p. 209.

Notes on some fresh-water *Crustacea* from Illinois, Indiana, and Mississippi, by P. O. Hay, Am. Nat. xvi. [1882] pp. 143–146 & 241–243.

A blind Copepod (*Bradya*) found in a slightly saline marsh at the shore of the Gulf of Mexico; C. L. Herrick, Am. Nat. xvii. p. 206.

F. W. Cragin's paper on the fresh-water Copepods in Tr. Kansas Ac. viii. pp. 66–81, pl. iv., with 4 new species, has not been seen by the Recorder.

Trinidad. Notes on its fresh-water and terrestrial *Crustacea*, including a species of *Ægа*, by J. v. Kennel, Arb. Inst. Würzb. vi., sep. copy, pp. 8, 9, & 17.

Australian Desert. A species of *Apus* and one of *Limnetis* found by E. B. Saenger abundantly in small rain pools; Am. Nat. xvii. p. 1185.

New Zealand. Additional notes on some subterranean *Crustacea*, some of which are nearly allied to marine forms, and a new genus described; C. Chilton, Tr. N. Z. Inst. xv. pp. 69 & 87–92, pl. iv.

2. *European Seas.*

J. T. Carrington & E. Lovett continue their "Notes and Observations on British Stalk-eyed *Crustacea*"; Zool. (2) vii. pp. 68–72 & 213–218.

Belgian Coast. Some species of *Crustacea*, including *Balanus perforatus* (Brug.), mentioned by P. Pelseneer, Ann. Soc. mal. Belg. xvii. p. 40.

The Podopthalmous *Crustacea* found at Concarneau, South coast of Brittany, are enumerated by T. Barrois in a separate pamphlet [title, *suprà*].

A. F. Marion mentions particularly 8 species of characteristic deep-sea *Crustacea* of the Mediterranean, between Marseilles and Corsica, in his "Considérations sur les faunes profondes de la Méditerranée," Ann. Mus. Marseille, i. p. 36.

7 species of *Ostracoda* dredged by Capt. Spratt, off Crete, 70–120 fath., enumerated by J. Gwyn Jeffreys, Ann. N. H. (5) xi. p. 401.

P

3. *Exotic Seas.*

Preliminary account of the *Crustacea* observed during Nordenskiöld's Expedition along the Northern coast of Asia, by A. Stuxberg, in Vega-Expeditionens Vetenskapliga Iakttagelser, vol. i. pp. 695–729, woodcuts, pp. 734, 736, 738, 761–769, & 775–780. For general conclusions, see *Mollusca*, p. 31.

Labrador. 4 *Brachyura*, 3 *Paguridæ*, 13 *Macrura*, 1 Schizopod, 1 *Diastylis*, 1 *Nebalia*, 29 Amphipods, 6 Isopods, 1 Ostracode, 1 Copepod, 4 *Cirripedia*, and 1 *Peltogaster*, from the collections of W. A. Stearns and Packard, enumerated with critical observations by Sidney I. Smith, P. U. S. Nat. Mus. vi. pp. 218–232.

South Coast of New England. 14 species of *Brachyura* and 17 *Anomura*, including several new *Paguridæ* and *Galateidæ*, dredged off Martha's Vineyard, at depths greater than 50 fath., by the U. S. Fish Commission in 1880–82, enumerated, and their measurements given, with special regard to age and sex; *id. l. c.* pp. 1–57, pls. i.–vi.

Many species found abundantly off the South coast of New England in 1880 and 1881 could not be found in the same region in 1882; they were specially characteristic of the narrow belt of warm water, 50° F., in from 60–160 fath.; Verrill suggests that they were destroyed by a severe storm in the winter 1881–82, which agitated the bottom water, and caused a sudden lowering of the temperature. *Id. l. c.* pp. 1 & 2.

East Coast of North America. Rare and new *Isopoda* by O. Harger, Bull. Mus. C. Z. ix. No. 4, pp. 90–104, pls. i.–iv.

West Coast of Morocco, Canary Islands, Sargasso Sea, and *Azores.* Preliminary notes on some *Crustacea* found during the expedition of the 'Talisman,' by A. Milne-Edwards, in Bull. hebd. de l'Ass. scient. de France, Dec. 1883.

T. Studer enumerates or describes 18 species of *Brachyura*, 8 of *Macrura*, including *Anomura*, 1 Isopod, and 2 Cirripeds, collected during the expedition of the German ship 'Gazelle' on the Western coast of Africa, from the Cape Verde Islands to the Cape of Good Hope. Some species are common to the West coast of Africa and the East coast of America; these are either natatory or terrestrial forms. Not only most of those from Cape Verde, but also several species from Liberia, are identical with those living in the Mediterranean. The species dredged on the West coast in depths exceeding 100 fath., near Ascension Island in 60 fath., and south of the Cape of Good Hope in 117 fath., are mostly new. Abh. Ak. Berlin, 1882 [1883], 32 pp., 2 pls.

The *Copepoda* obtained by H.M.S. 'Challenger' in 1873–76 are discussed by G. Stewardson Brady in vol. viii. of the Zoology of H.M.S. 'Challenger'; they are 58 species of *Calanidæ*, 2 *Cyclopidæ*, 8 *Harpacticidæ*, 10 *Corycæidæ*, 12 *Saphirinidæ*, 13 *Caligidæ*, a new genus of *Dichelestidæ*, 1 *Chondracanthus*, and 1 *Lernæa*, in all 106 species, mostly from the surface. Many were found in far distant parts, especially among the *Calanidæ*, 52 in the North Atlantic, 51 in the South Atlantic, 15 in the South Indian Ocean, 48 in Australasia, 36 in the South Pacific, 22 in the

North Pacific, 45 in Eastern Asia, as stated in a table of the introduction. No less than 31 species out of the 58 of *Calanidæ* have been found both in the Atlantic and the Indian or Pacific Oceans. Among those from considerable depths may be mentioned the peculiarly spinous new genus *Pontostratiotes*, from 2200 fath, and a new *Lernæa* from 2400 fath.

P. P. C. HOEK treats of the *Cirripedia* obtained during the expedition of H.M.S. 'Challenger'; 77 species, 12 taken at the surface, 36 to a depth of 500 fath., 15 between 500 and 1000, 19 between 1000 and 2000, 7 between 2000 and 3000, none beyond 3000 fath.; those living beyond 500 fath. belong, with one exception, to the genera *Scalpellum* and *Verruca*. Zoology of H.M.S. 'Challenger,' viii., 169 pp., 13 pls.

New Zealand. New species by C. CHILTON, Tr. N. Z. Inst. xv. pp. 69-86, 145–150, & 188–190, pls. i.–iii., xviii. & xxii.; also by G. M. THOMSON, *tom. cit.* pp. 93-116, pls. v.–xi., and N. Z. J. Sci. i. pp. 341 & 342.

USE BY MAN.

Statistical note on the export of dry shrimps and shrimp-shells from the Pacific coast of North America, the latter as manure to China; DALL, Bull. U. S. Fish Comm. iii. p. 425.

DECAPODA.

BRACHYURA.

INACHIDÆ.

Collodes robustus, sp. n., S. I. Smith, P. U. S. Nat. Mus. vi. p. 6, South coast of New England.

Amathia tanneri, sp. n., *id. l. c.* p. 4, South coast of New England.

Euprognatha rostellifera (Stimps.). Biological and descriptive notes; *id. l. c.* pp. 9–11.

Lispognathus furcatus (Alph. M.-Edw.). Biological and descriptive observations; *id. l. c.* pp. 12–15.

Ergasticus clouei (A. M.-Edw.), from the Cape Verde Islands, 38 fath. described; T. Studer, Abh. Ak. Berlin, 1882 [1883] p. 7, pl. i. fig. 1.

Chionœcetes opilio (Kröyer) figured by A. Stuxberg in Vega Expeditionens Vetenskapliga Iakttagelser, i. p. 714.

Gonothorax, g. n. Near *Epialtus* and *Acanthonyx*; legs long, not prehensile; cephalothorax smooth, slightly convex, pentagonal, not beaked in front; eyes small, not retractile; third joint of the external antenna very long. *G. ruber*, sp. n., Madagascar. Alph. Milne.-Edwards, Bull. Soc. Philom. 1878.

MAIIDÆ.

Eurynome scutellata. Note by A. Roncalli, Bull. Soc. Ven.-Trent. ii. p. 200.

Parthenopidæ.

Lambrus verrucosus, sp. n., T. Studer, Abh. Ak. Berlin, 1882 [1883], p. 9, pl. i. fig. 2, Ascension Island, 60 fath.

Eumedon pentagonus, sp. n., Milne-Edwards, *l. c.*, Mauritius.

Cancridæ.

Platyxanthus crenulatus and *patagonicus*, spp. nn., Milne-Edwards, *l. c.*, Patagonia. [Genus described in the same author's "Crustacés fossiles," 1861–65, i. p. 226.]

Pseudocarcinus gigas. Very large claw found at Lane Cove; Trebeck, Abstract of P. Linn. Soc. N. S. W., June, 1883, p. ii.

Panopæus. Development [see *suprà*, pp. 7 & 8].

Eriphiidæ.

Geryon quinquedens (Smith) more than six inches across the carapace (152.5 mm.) and two feet across the out-stretched legs, off Martha's Vineyard, 200–600 fath.; S. I. Smith, P. U. S. Nat. Mus. vi. pp. 15–17.

Pilumnus heterochir, sp. n., T. Studer, Abh. Ak. Berlin, 1882 [1883] p. 11, pl. i. fig. 3, S. of Cape of Good Hope, 34° S. lat., 117 fath.

Rhabdonotus, g. n. Allied to *Trapezia* and *Cymo*; cephalothorax convex, smooth; basilar joint of the external antennæ not reaching the front. *R. pictus*, sp. n., Cochin China. Alph. Milne-Edwards, *l. c.*

Portunidæ.

Goniosoma maculatum (Fabr.) from Amboyna, a variety from Madagascar; *G. dubium* (Hoffm.) = *orientale* (Dana), from Réunion and Timor; and *G. acutifrons* (De Man) from Timor: De Man, Notes Leyd. Mus. v. pp. 151 & 152.

Bathynectes longispina (Stimps.) = *brevispina* (Stimps.), the former a very young male, the latter a very large female, South coast of New England; S. I. Smith, P. U. S. Nat. Mus. vi. p. 17.

Neptunus convexus (De Haan) = *sieboldi* (Alph. M.-Edw.); De Man, Notes Leyd. Mus. v. p. 150.

Lupocyclus rotundatus (Ad. & White), from Amboyna, described; *id. l. c.* p. 153.

Telphusidæ.

Telphusa socotrensis, sp. n., Hilgendorf, Z. ges. Naturw. (4) ii. p. 171, Socotra.

Geotelphusa kuhli, sp. n., De Man, *l. c.* p. 154, Java.

Gecarcinidæ.

Cardi[o]soma carnifex (Hbst.) from Socotra; Taschenberg, Z. ges. Naturw. (4) ii. p. 171.

Ocypodidæ.

Ocypode africana (De Man) is quite distinct from *kuhli* (De Haan); De Man, Notes Leyd. Mus. v. p. 155.

Ocypode sp. from the Bonin Islands. Remarkable varieties in the prolongation of the eye-stalk beyond the eye, and in the outline of the anterior border of the carapace; C. Ishikawa, Am. Nat. xvii. p. 207, pl. iv. Critical note on these statements; S. I. Smith, *tom. cit.* p. 427.

Grapsidæ.

Grapsus gracilipes (M.-Edw.) is perhaps only a variety of *maculatus* (Catesby); De Man, *l. c.* p. 159.

Metopograpsus quadridentatus (Stimps.), from Amoy, described; *id. l. c.* p. 158.

Plagusia tuberculata (Lam.) not geographically separated from *depressa* (Say), a specimen wholly agreeing with the latter being also found at Amboyna; *id. l. c.* pp. 168 & 169.

Pyxidognathus, g. n. Near *Gnathograpsus*: exognath very enlarged, its lateral margins convex, ischiognath narrow at the base, merognath very large, auriculated; external antennæ very small, inserted in the lower angle of the orbit. *P. granulosus*, sp. n., Ovalau, Alph. Milne-Edwards, Bull. Soc. Philom., Dec., 1878. *Hypsilograpsus deldeni* (De Man, April, 1879) is the same; De Man, Notes Leyd. Mus. v. p. 160.

Sesarma buettikoferi, sp. n., Liberia, *kamermani*, sp. n., Congo, and new description of *S. angolensis* (Brito Capello) and *indica* (M.-Edw.); De Man, *l. c.* pp. 162–168.

Pinnoteridæ.

Hymenosoma lacustre (Chilton, as *Elamene*, 1882), from Lake Pupuke, New Zealand, more fully described; C. Chilton, Tr. N. Z. Inst. xv. p. 69.

Leucosiidæ.

Ilia nucleus (Herbst). Short note on its habits; H. Lucas, Ann. Soc. Ent. Fr. (6) iii. p. lxxix.

Calappidæ.

Osachila stimpsoni, sp. n., T. Studer, Abh. Ak. Berlin, 1882 [1883] p. 15, pl. i. fig. 4, Ascension Island, 60 fath.

Dorippidæ.

Ethusa microphthalma (Smith). Individual differences; S. I. Smith, P. U. S. Nat. Mus. vi. p. 22.

Cymopolia gracilis, sp. n., *id. l. c.* p. 20, South coast of New England, 142 fath.

ANOMURA.

Dromiidæ.

Dromidia bicornis and *spinosa*, spp. nn., T. Studer, Abh. Ak. Berlin, 1882 [1883] pp. 20–22, pl. i. figs. 9 & 10, S. of Cape of Good Hope, 34° S. lat., 117 fath.

Raninidæ.

Notopus atlanticus, sp. n., *id. l. c.* p. 17, pl. i. fig. 5, Ascension Island, 60 fath. Young stages of *N. dorsipes* (F.); *id. l. c.* p. 19, pl. i. figs. 6 & 7.

Hippidæ.

Hippa talpoidea (Say). Apparent bird-tracks occasioned by it [Zool. Rec. xix. *Crust.* p. 18]; T. Meehan, Nature, xxvii. p. 91, and Zool. (3) vii. p. 378.

Paguridæ.

Pagurus sp. [*callidus* (Risso).—Rec.]. General remarks on its association with *Adamsia palliata* (Boh.) by O. Hertwig in his pamphlet, "Die Symbiose," 1883, pp. 4–6, pl. i. fig. 11. The same subject also treated by H. Eisig, Kosmos, xii. pp. 388–392.

Eupagurus politus (Smith) abundant from Cape Cod to Carolina in from 50 to 400 fath., described; S. I. Smith, P. U. S. Nat. Mus. vi. pp. 27–31, pl. iv. fig. 1.

Eupagurus dimorphus, sp. n., S. of Cape of Good Hope, 34° S. lat., 117 fath., and *ungulatus*, sp. n., Table Bay, 50 fath., T. Studer, Abh. Ak. Berlin, 1882 [1883] pp. 24–27, pl. ii. figs. 11–13. The figures of the old male very different from those of the female in the former species; it lives in shells of *Buccinum porcatum*, invested by *Epizoanthus cancrisocius* (Martens).

Parapagurus pilosimanus (S. I. Smith), South coast of New England, described, and individual variations noted; S. I. Smith, *l. c.* pp. 33–36, pls. v. figs. 3–5, & vi. figs. 1–4.

Catapagurus (Alph. M.-Edw., 1880) = *Hemipagurus* (S. I. Smith, 1881); *C. sharreri* (Alph. M.-Edw.) = *socialis* (S. I. Smith). Measurements; *id. l. c.* p. 31, pl. iv. fig. 5.

Sympagurus, g. n., having phyllobranchiæ, the lamellæ long, narrow, arranged in two loosely-packed longitudinal series either side of the axis of the branchia. Peduncles of the antennulæ short; eyes well-developed. Appendages of the first and second somites of the abdomen in the male small and little developed. In other respects like *Parapagurus*. *S. pictus*, sp. n., South coast of New England, 164–264 fath. *Id. l. c.* pp. 37–40, pls. v. fig. 2, & vi. figs. 5–8.

Birgus feeding indeed on cocoa-nuts [as already mentioned by Rumph, 1705.—Rec.], observed on the Solomon Islands by H. B. Guppy, P. Linn. Soc. N. S. W. vii. pp. 661–665. Notes on its structure, habits, and

ographical distribution, from Madagascar and the Seychelles to the acific; H. Lucas, Ann. Soc. Ent. Fr. (6) iii. p. xxxv.

MACRURA.

GALATEIDÆ.

Munida caribæa (Stimps. ?) and *valida*, sp. n., South coast of New England, 60–70 fath.; S. I. Smith, *l. c.* pp. 40–44, pls. i. & iii. fig. 11.

Munida speciosa (Martens, 1878) from W. Africa, 10° N. lat., 115 fath.; T. Studer, Abh. Ak. Berlin, 1882 [1883] p. 28, pl. ii. fig. 14.

Eumunida, g. n. Front five-spined, no branchiæ at the basis of the external maxillipeds; telson very broad and transversely segmented; no appendages on the first five abdominal somites in the male. *E. picta*, sp. n., South coast of New England, 115–158 fath. S. I. Smith, *l. c.* pp. 44–50, pls. ii. fig. 2, iii. figs. 6–10, & iv. figs. 1–3.

Anoplonotus, g. n. Near *Elasmonotus* (M.-Edw.), but merus of the external maxilliped short and broad; no spines, teeth, or keels, on the carapace and abdomen. *A. politus*, sp. n., South coast of New England, 70–134 fath. *Id. l. c.* pp. 50–55, pls. ii. fig. 1, & iii. figs. 1–5.

PALINURIDÆ.

Palinurus. T. J. Parker's paper on the structure of the head of this genus, N. Z. J. Sci. i. pp. 584 & 585, has not been seen by the Recorder; abstract in Nature, xxix. p. 189.

Palinurus longimanus (M.-Edw.) from Martinique; H. Lucas, Ann. Soc. Ent. Fr. (6) iii. p. lvii.

ASTACIDÆ.

Common crayfish: sickness and abnormities [see *suprà*, p. 10].

F. T. KÖPPEN points out the geographical distribution of the species of *Astacus* in the Russian Empire. *A. fluviatilis* (Roud.) is almost exclusively confined to the waters, rivers, and lakes discharging into the Baltic; *A. pachypus* (Rathke) and *colchicus* (Kessl.), to those of the Caspian and Pontic basin; *A. leptodactylus* (Esch.), probably originally proper to the Pontic and Caspian basin, lives at present also in the northern part of Russia, in many rivers flowing into the White Sea or the Gulf of Finland, where it appears to have supplanted *A. fluviatilis*; it was brought, in 1822, by F. J. Fétissow into the river Isset, a confluent of the Tobol, and is now found rather commonly in those two rivers, and in the Tura, Irtysch, Tara, Om, and also in some upper part of the Obi, partly transferred by man, partly also spontaneously spreading up the rivers, whereas formerly no crayfish was found in Western Siberia. Beitr. Russ. Reiches (2) vi., 17 pp.

[*Cambarus.*] Note on subterraneous holes occupied by crayfishes in Iowa; C. Aldrich, Am. Nat. xvi. [1882] p. 57.

Paranephrops compared with *Astacus*; G. Chilton, Tr. N. Z. Inst. xv. pp. 150–165, 3 pls.

THALASSINIDÆ.

Callianassa filholi, sp. n., Alph. Milne-Edwards, Bull. Soc. Philom. 1878, Stewart Island.

Axia acantha, sp. n., *id. l. c.*, New Caledonia.

CRANGONIDÆ.

Crangon salebrosus (Owen) and *Sabinea septemcarinata* (Sabine), woodcut; Stuxberg, in Nordenskiöld's Vega Expeditionens Vetenskapliga Iakttagelser, i. 1882, p. 696.

PALÆMONIDÆ.

Hippolyte polaris (Ross) from Labrador described; S. I. Smith, P. U. S. Nat. Mus. vi. p. 220.

Palæmon ohionis (Smith) near Vicksburg, Miss., described; O. P. Hay, Am. Nat. xvi. [1882] p. 143.

Palæmonetes exilipes (Stimps.). Its occurrence in the rivers of Missouri and Illinois; *id. l. c.* p. 144.

SERGESTIDÆ.

Acetes. Development described by Brooks [see *suprà*, p. 9].

LUCIFERIDÆ.

Lucifer. Development [see also pp. 8 & 9].

SCHIZOPODA.

Ceratolepis, *Nyctiphanes*, *Stylocheiron* [*-chiron*], *Nematoscelis*, and *Euchætomera*, gg. nn., preliminarily indicated by G. O. Sars, Förh. Selsk. Christ. 1883, No. 7, from the 'Challenger' Expedition.

CUMACEA.

Diastylis rathkii (Kröyer) figured, with account of its occurrence in the glacial sea of the Northern coast of Siberia; Stuxberg, in Vega Expeditionens Vetenskapliga Iakttagelser, i. pp. 722, 729, & 754.

AMPHIPODA.

A general introduction to the *Amphipoda*, containing an historical account, an enumeration of their literature, and general outlines of

their structure; A. Gerstäcker, in his continuation of Bronn's Klassen u. Ordnungen des Thierreichs, v. *Arthropoda*, 2nd division, pp. 279–304, pls. xxvii. & xxviii.

Ne

Orchestiidæ.

Nicea egegie..., sp. n., Chilton, Tr. N. Z. Inst. xv. p. 77, pl. ii. fig. 2, Lyttelton Harbour, New Zealand.

Gammaridæ.

Stegocephalus kessleri, sp. n., not described but figured by Stuxberg, in Vega Exped. Vet. Iaktt. i. p. 713, Northern coast of Asia.

Cyproidia (?) *crassa*, sp. n., Chilton, Tr. N. Z. Inst. xv. p. 80, pl. iii. fig. 1, Lyttelton Harbour, New Zealand.

Andania gigantea, sp. n., Stebbing, Ann. N. H. (5) xi. p. 206, 2½ inches in length, 'Challenger' Expedition, no locality given.

Montagua (Sp. Bate, *nec* Fleming) renamed *Montaguana*, and *M. miersi* (?), Hasw., redescribed; Chilton, *l. c.* pp. 78 & 79.

Acanthostephia malmgreni (Goes). Woodcut and account of its general occurrence in the Siberian glacial sea; Stuxberg, *l. c.* pp. 724 & 729.

Acanthostephia ornata, sp. n., Stebbing, *l. c.* p. 203, from the 'Challenger' Expedition.

Œdiceropsis rostrata, sp. n., *id. l. c.* p. 204, 'Challenger' Expedition.

Iphimedia pulchridentata and *pacifica*, spp. nn., *id. l. c.* pp. 206 & 207, 'Challenger' Expedition.

Epimeria conspicua, sp. n., *id. l. c.* p. 205, 'Challenger' Expedition.

Acanthozone tricarinata, sp. n., *id. ibid.*, 'Challenger' Expedition.

Atylus carinatus (Fab.). Its occurrence in the Siberian glacial sea; Stuxberg, *l. c.* pp. 723 & 729.

Weyprechtia, g. n., for *W. mirabilis*, sp. n., 51 mm. long. Description of the species, but no generic characters given; Stuxberg, *l. c.* p. 712, Northern coast of Siberia, near Bering's Straits, 4–6 fath.

Mœra incerta, sp. n., Chilton, *l. c.* p. 83, pl. iii. fig. 3, Lyttelton Harbour, New Zealand; *M. spinosa* (Haswell), pl. ii. fig 3*a*, *M. petrici* (Thoms.), pl. ii. fig. 4*a*.

Amathillopsis australis, sp. n., Stebbing, *l. c.* p. 205, 'Challenger' Expedition.

Harmonia crassipes (Haswell), New Zealand, redescribed, first gnathopods figured; Chilton, *l. c.* p. 82, pl. ii. fig. 5.

Corophiidæ.

Podocerus frequens, sp. n., Chilton, Tr. N. Z. Inst. xv. p. 85, pl. iii. fig. 2, Lyttelton Harbour, New Zealand.

Caprellidæ.

Dodecas, g. n. Six pairs of feet attached to the perion, the fourth segment having none; an elongate triarticulate mandibular palpus; branchial

vesicles at the second gnathopods, the first pleriopods, and the footless fourth perion segment. *D. elongata*, sp. n., from the 'Challenger' Expedition, no locality given. Stebbing, Ann. N. H. (5) xvi. p. 207.

ISOPODA.

L. HUET has published some valuable anatomical observations on this Order, remarking upon several points in which it approaches the *Arachnida* and *Insecta*, as, for example, the silky secretion of the cutaneous glands in some terrestrial genera, the white bodies of the opercular gills as rudiments of a tracheal system, &c.; J. de l'Anat. Phys. xix. pp. 241–376, 4 pls.; abstract in J. R. Micr. Soc. (2) iii. pp. 835 & 836.

The geographical and palæontological distribution of the *Isopoda* are treated upon by A. GERSTÄCKER in his continuation of Bronn's Klassen u. Ordnungen des Thierreichs, v. *Arthropoda*, 2nd division, pp. 241–278.

On the organs of generation in this Order [see *suprà*, p. 7].

TANAIDÆ.

Tanais œrstedti (Kröyer) = *rhynchites*, male, and *balticus*, female (Fr. Müller), observed at Kiel and anatomically described; H. Blanc, Zool. Anz. 1883, pp. 634–637.

Apseudes (? g. n.) *timaruvia*, sp. n., Chilton, Tr. N. Z. Inst. xv. pp. 146–149, pl. xviii., Timaru. Eyes not pedunculated.

ANTHURIDÆ.

Phreatoicus, g. n., C. Chilton, Tr. N. Z. Inst. xv. p. 89. Of uncertain position, having affinities to several distinct groups, and therefore of considerable antiquity. Superficially resembling some *Amphipoda*; also resembling *Idotea* in its elongate form, antennæ, and plate at the base of the maxilliped, but with different abdomen and an appendage to the mandible. Also resembling *Anthura* and *Paranthura*, but approaching the *Tanaidæ* in its long abdomen, composed of separate segments. *P. typicus*, sp. n., *ibid.* pl. iv., from a pump at Eyreton, New Zealand.

Anthura affinis, sp. n., *id. l. c.* p. 72, pl. i. fig. 4, Lyttelton Harbour, New Zealand.

IDOTEIDÆ.

Idotea entomon (L.) and *sabinii* (Kröyer) figured, and an account of their geographical distribution given; Stuxberg, *l. c.* pp. 717–721, 727–729, & 753.

Idotea elongata. Note on its habitat; C. Chilton, N. Z. J. Sci. i. p. 517.

ASELLIDÆ.

Asellus communis (Say) and *Munnasellus tenax* (Smith) found at Jackson, Mississippi, &c.; Hay, Am. Nat. xvi. pp. 241 & 242.

Jæra novæ-zealandiæ, sp. n., Chilton, Tr. N. Z. Inst. xv. p. 189, Lyttelton Harbour, New Zealand.

Limnoria segnis, sp. n., *id. l. c.* p. 76, pl. ii. fig. 1, Lyttelton Harbour, New Zealand (genus new to New Zealand).

Oniscidæ.

Philongria [*Philygria*] *rosea* (Koch) substantiated as indigenous to New Zealand; Chilton, *l. c.* pp. 73 & 149.

Cubaris rugulosus (Miers) redescribed; *id. l. c.* p. 73, pl. i. fig. 3*b*.

Sphæromidæ.

Cymodocea cordiforaminalis, sp. n., Chilton, *l. c.* p. 188, pl. xxii.A, fig. 1, Lyttelton Harbour.

Scutuloidea, g. n., Chilton, *l. c.* p. 69. Nearest to *Cassidina* (M.-E.), but with the last pair of pleopoda unibranchiate. *S. maculata*, sp. n., p. 70, pl. i. fig. 1, Timaru and Lyttelton Harbour, New Zealand.

Plakarthrium, g. n., Chilton, *l. c.* p. 74. In some respects like *Amphoroidea*. Both antennæ with some of the basal joints expanded, flat; outer antennæ with a flagellum; body much depressed. *P. typicum*, sp. n., *ibid.* pl. i. fig. 5, on sea-weed, which it much resembles, Lyttelton Harbour, New Zealand.

Cirolanidæ.

Cirolana impressa, sp. n., and *spinipes* (Bate & Westwood), East coast of United States, 38° and 32° N. lat., 117 and 321 fath.; Harger, Bull. Mus. C. Z. ix. No. 4, pp. 91–95, pls. i. figs. 2 & 3, & ii. figs. 1 & 3.

Cirolana longicornis, sp. n., T. Studer, Abh. Ak. Berlin, 1882 [1883] p. 28, pl. ii. fig. 15, Table Bay, S. Africa, 50 fath.

Ægidæ.

Ægа incisa (Schiödte & Meinert), East coast of United States, 31° N. lat., 333 fath.; Harger, *l. c.* p. 96, pl. iii. fig. 1.

Pseudæga, g. n., Thomson, N. Z. J. Sci. i. p. 341. [Not seen by Recorder.]

Rocinela oculata, sp. n., and *americana* (Schiödte), East coast of United States, 32° and 37–40° N. lat., 252 and 85–157 fath.; Harger, *l. c.* pp. 97–99, pl. iii. figs. 2 & 3, & iv. figs. 1 & 2.

Sycenus infelix (Harger, 1880), East coast of United States, 40–41° N. lat., 304–306 fath.; *id. l. c.* pp. 100–102, pls. iii. fig. 5, & iv. fig. 3.

Cymothoidæ.

Schiödte & Meinert, Nat. Tids. xiii., continuing their monograph, form a new chief division, *Saophridæ*, with the following characters:— The last three segments of the body very short, the fifth abruptly shorter than the fourth; eyes manifest; antennæ of the first pair somewhat

compressed, rather long, 8-jointed; those of the second pair somewhat thinner and scarcely longer, also 8-jointed; all feet hooked, rather long, with very long claws; post-abdomen manifestly articulated, 6-jointed, the first joint for a great part covered; anal segment very large, transverse and semicircular, with smooth margin; basal joint of the anal feet produced into a point; branches of the anal feet leaf-shaped, thin, internal branch much longer than the external. To this division, belongs only the genus:—

Saophris, new name for *Lobothorax* (Bleeker), the authors thinking the latter philologically inadmissible. Body of both sexes strongly keeled, hinder margin of the anterior segments deeply notched. *S. typus* (Bleeker, *Lobothorax*), Batavia, and *aurita*, sp. n., Ubay, Philippines, fully described, pp. 281–286, pl. xi. figs. 1–4.

The *Cymothoidæ*, s. str., are subdivided by these authors into two tribes: *Ceratothoinæ*, antennæ dilated or compressed, those of the first pair contiguous, and *Cymothoinæ*, antennæ cylindrical, distant at the base. To the first tribe, belong the following genera:—

Rhexana, g. n. Head small, much immersed; body flat. *R. verrucosa*, sp. n., Japan, probably the *Oniscus ceti* of Spengler, 1775 (*nec* Linn.); pp. 289–296, pl. xi. figs. 5–10.

Cleatessa, g. n. Distinguished from the former by the convex body. *C. retusa*, sp. n., Natal and Mozambique; pp. 296–299, pl. xi. figs. 11–17.

Glossobius, g. n. Head large, less immersed; claws of the feet unequal, those of the third pair very large. *G. linearis* (Dana, as *Ceratothoa*) = *C. exocœti* (Cunningh.) and *G. laticauda* (M.-Edw., *Cymothoa*) = *C. crassa* (Dana), both living on the tongue of several species of *Exocœtus* in various seas; pp. 299–315, pl. xii. figs. 1–16.

Emetha, g. n. Head large; claws of the feet equal; summit of the forehead covered by the antennæ. *E. audouini* (M.-Edw., as *Cymothoa*), Mediterranean; p. 321, pl. xi. figs. 14–18.

Ceratothoa (Dana). Restricted, distinct from the former by the forehead being prominent between the antennæ; 11 species described and figured; *italica*, Fiume, *gobii*, Messina, and *collaris*, Algeria, are new; pp. 322–371, pls. xiii.–xvi.

In Nat. Tids. xiv., the same authors discuss the *Cymothoinæ* as follows:—

Cymothoa. 17 species described and figured, pp. 222–287, pls. vi.–x., including *C. curta* (on *Anableps tetrophthalmus*), *exigua*, from Panama and the Galápagos, *brasiliensis* = ? *excisa* (Dana), Rio Janeiro, *plebeia*, Cape Verde, *gerris*, Caxoeira (in the mouth of *Gerres brasiliensis*), *januarii*, Rio Janeiro (in the mouth of *Priacanthus* and *Platessa*), *limbata*, Cape York, *indica*, Bangkok, *rhina*, Philippines, *globosa*, Atlantic (in the mouth of *Ephippus faber*), *truncata* and *eximia*, Indian Seas, and *borbonica*, Bourbon Island, all spp. nn.; *C. excisa* (Perty) = *parasita* (Reuss), and is probably the species mentioned by Marcgrave in Hist. Nat. Brasil, 1648, p. 156; *C. eremita* (Brünnich) = *œstrum* (Spengler) = *stromate* (Bleeker). Several forms of age and sex are described in some species.

Telotha, g. n. Antennæ as in *Cymothoa*; body rather convex, plion obconical, the keel of the four posterior pairs of feet less expressed than

in *Cymothoa*, as it is also in the following genera. *T. henseli* (Martens, as *Cymothoa*) and *lunaris*, sp. n., both on fresh-water fishes of Brazil, the latter in the gill cavity of *Sternarchus*; Schiödte & Meinert, pp. 286–292, pl. x. figs. 11–14.

Enispa, g. n. Distinct from the preceding by the subcylindrical plion. *E. triangularis* (Bleeker, as *Cymothoa*), Indian Sea; pp. 292–297, pl. xi. figs. 1 & 2.

Ichthyoxenus jellinghausi (Herklots). Male and female together in a pouch of the belly behind the ventral fins on *Puntius maculatus*, Java, and *montanus*, sp. n., Himálaya, on *Puntius sophore*; pp. 297–309, pl. xi. figs. 5–17.

Catoessa, g. n. Distinct by an obconical plion from the preceding, in which it is constricted at the base; body in both rather flat. *C. scabricauda* (Mus. Berolin, MS.), sp. n., Adenare Island, near Flores, Malayan Archipelago; pp. 309–311, pl. xii. figs. 1 & 2.

Cinusa, g. n. First pair of antennæ less distant one from the other than in *Cymothoa*, and segment much shorter than all the preceding segments of the plion together. *C. tetrodontis*, sp. n., in the mouth of *Tetrodon honckeni*, Cape of Good Hope, Indian and Pacific Sea; pp. 311–318, pl. xii. figs. 3–7.

Rhinorthra, g. n. Anal segment larger than all the preceding segments of the plion together; first antennæ as in the preceding. *R. callipia*, sp. n., Indian Sea; pp. 318–324, pl. xii. figs. 8–13.

A third tribe, *Livonecinæ*, has compressed antennæ, the first pair distant at the base from one another, the plion forming a continuous outline with the perion, but deeply immersed in it, and a rather convex body. To this, belong the following genera :—

Agarna, g. n. Body gibbous, the last segments flattened and dilated only on one side. *A. carinata*, sp. n., St. Croix, on *Acanthurus chirurgus*; pp. 328–334, pl. xiii. figs. 1–6.

Idusa, g. n. Body compressed, last segments convex. *I. plagusiæ*, sp. n., West Indies, on the blind side of the Pleuronectid genus *Plagusia*; pp. 334–336, pl. xiii. figs. 7 & 8.

Elthusa, g. n. Body rather flat, front rounded. *E. emarginata* (Bleeker, as *Livoneca*), Indian Seas, beneath the gill-cover of *Upeneus*; pp. 337–340, pl. xiii. figs. 9 & 10.

Livoneca (Leach). 12 species previously characterized, 2 fully described, including *panamensis*, sp. n.; pp. 340–352, pls. xiii. figs. 11–14, & xiv. fig. 1.

Irona, g. n. Distinct from *Livoneca* by the very deeply immersed plion; p. 325.

Cterissa, g. n. Front rather sharply angulated; p. 325.

Artystone (Schiödte, 1866). Distinct from all preceding by the last pair of feet being much longer than the others, with rather straight claws; p. 325.

Urozeuktes (M.-Edw.) belongs also to this tribe; p. 325.

The paper ends abruptly in the middle of a special description of *Livoneca*, and the above genera following it are taken from the introductory table.

Bopyridæ.

Short note on *Ione thoracica* (Mont.); H. Lucas, Ann. Soc. Ent. Fr. (6) iii. p. lxxviii.

PHYLLOPODA.

A. S. Packard has published an elaborate monograph of the North American Phyllopods in Rep. U. S. Geol. Surv. xii. He describes and figures the North American genera and species, viz.: 4 *Limnetis*, 7 *Estheria*, 2 *Eulimnadia*, 1 *Limnadella*, 3 *Lepidurus*, 4 *Apus*, 1 *Artemia*, 3 *Branchinecta*, 2 *Branchipus*, 3 *Streptocephalus*, 1 *Chirocephalus*, and 1 *Thamnocephalus*, and some others from the West Indies; and then proceeds to their geological succession, which he derives from the *Cladocera*, and to their geographical distribution, which is illustrated by a zoogeographical map of North America, and by lists of the known *Phyllopoda* from other countries. The external and internal anatomy, development, and metamorphoses, relations to environment and habits, and the systematic relations of *Nebalia* to them, are discussed, and the whole is illustrated by a set of 39 plates.

Branchipodidæ.

Eubranchipus borealis (Verr.). Occurrence at Irvington, Indiana; Hay, Am. Nat. xvi. [1882] p. 242.

Wierzejski's paper on *Branchinecta paludosa* [Zool. Rec. xix. *Crust.* p. 5] is extracted in Biol. Centralbl. ii. pp. 765 & 766.

Branchinecta lindahli, sp. n., Packard, Monogr. N. Am. Phyllop. p. 339, pl. xi. figs. 1 & 7, Kansas.

Apodidæ.

Apus himalayanus (Packard, 1871) described and figured; Packard, Monogr. p. 327, pl. xvi. fig. 5 [hitherto omitted from Zool. Rec.].

CLADOCERA.

Sididæ.

Latona setifera (Straus) from Grasmere and Rydal Water; C. Beck, J. R. Micr. Soc. (2) iii. p. 782, pl. xii. figs. 9-14.

Holopedium gibberum (Zaddach) from Grasmere and Windermere; *id. l. c.* p. 780, pl. xi.

Daphniidæ.

Daphnia. The spine at the hinder part of the shell is a permanent embryonal character, and therefore variable; *D. longispina* (Herrick, 1877, *nec* Müll.), figured, and *dubia*, sp. n. ?, North America, no locality

given: Herrick, Am. Nat. xvii. pp. 500 & 501, pl. vi. figs. 1–10, 13, & 14.

Daphnia kerusses, sp. n. [no author], Am. Micr. J. iv. p. 88.

Daphnia similis, sp. n., Thomson, N. Z. J. Sci. i. p. 478, New Zealand.

Simocephalus daphnoides, sp. n., Herrick, Am. Nat. xvii. p. 503, pls. v. figs. 30 & 31, & vi. fig. 16, Alabama.

Ceriodaphnia alabamensis, sp. n., *id. ibid.* pl. vi. figs. 11 & 12, Alabama.

Scapholeberis angulata, sp. n., Alabama, and *armata* (Herrick, 1881), Minnesota; *id. l. c.* p. 502, pls. v. figs. 26–28, & vi. figs. 23 & 24.

Polyphemidæ.

Bythotrephes cederstræmi (Schiödte) from Cumberland and Westmoreland; C. Beck, J. R. Micr. Soc. (2) iii. p. 780, pl. xii. figs. 1–8.

OSTRACODA.

Notes on the *Ostracoda* from the Quaternary beds at Rizzolo, Sicily; G. Seguenza, Nat. Sicil. iii. pp. 16–22, 48–51, & 67–71.

Cypridæ.

Pontocypris punctata and *polita*, spp. nn., Seguenza, *l. c.* pp. 39 & 40, Messina. *P. interposita* and *calabra* (Seguenza) figured; *id. l. c.* pl. i. figs. 1 & 2.

Argillæcia messanensis, Messina, and *subreniformis*, Quaternary beds at Rizzolo; *id. l. c.* pp. 41 & 17, the latter pl. i. fig. 5.

Macrocypris elongata, gracilis, trigona, spp. nn., *id. op. cit.* ii. pp. 204 & 205, & iii. pp. 76 & 77, Port of Messina. *M. inflata* and *compressa* (Seguenza) figured; *id. l. c.* pl. i. figs. 3 & 4.

Cytheridæ.

Cythere cimbæformis[*-bif-*], *venus, phaseolina, bicostata, multipunctata*, spp. nn., Seguenza, *op. cit.* iii. pp. 20, 48, 49, 67, & 68, pl. i. figs. 6–9, from Quaternary beds at Rizzola.

COPEPODA.

General morphological remarks by C. L. Herrick [see *suprà*, pp. 4 & 10].

G. S. Brady's treatise on the *Copepoda* of the 'Challenger' contains much valuable information on the systematic knowledge of this Order, chiefly of the *Calanidæ*; besides the new genera and species, many others are recharacterized and their details figured.

General notes on the oral parts of the *Copepoda*, and especially on those of *Corycæus, Sapphirina, Lichomolgus*, and *Ergasilus*, by K. Sumpf, in his Dissertation [see below, under *Taniacanthus*], pp. 25–30, pl. ii. figs. 2–5.

On New Zealand *Copepoda*; G. M. Thomson, Tr. N. Z. Inst. xv. pp. 93–116, pls. v.–xi.

Calanidæ.

Calanus valgus and *tonsus*, Pacific and South Atlantic, *princeps*, 12.5 mm., the largest of the *Calanidæ*, North Atlantic, spp. nn., Brady, Copep. 'Challenger,' pp. 33–37, pls. iii. figs. 1–7, & iv. figs. 3–9.

Eucalanus setiger, sp. n., *id. l. c.* p. 39, pl. iii. figs. 8–15, Mid Atlantic and Pacific.

Rhinocalanus gigas, sp. n., *id. l. c.* p. 42, pl. viii., South Atlantic, Southern Indian Ocean, and Northern Pacific.

Hemicalanus orientalis, Banda Sea, and *aculeatus*, Pacific, spp. nn., *id. l. c.* p. 45, pls. ix. figs. 8 & 9, x. figs. 1–4, & xlvi. figs. 2–4.

Leuckartia ? scopularis, sp. n., *id. l. c.* p. 51, pl. xiv. figs. 1–5, N. Pacific.

Scolecithrix, g. n. Distinct from *Undina* by a short and furcate rostrum; anterior antennæ in the female twenty- to twenty-three-jointed, in the male nineteen-jointed; anterior foot-jaw bearing at the apex, instead of the usual curved setæ, a bunch of thick flexuous (sensory?) filaments; abdomen in both sexes four-jointed. *S. danæ* (Lubbock, as *Undina*), Pacific and North Atlantic, *minor*, sp. n., Southern Indian Ocean. *Id. l. c.* pp. 56–59, pls. xvii., xvi. figs. 15 & 16, & xviii. figs. 1–5.

Euchæta philippi, South Atlantic, *australis*, Australia and South Atlantic, *gigas* and *barbata*, South Atlantic, *id. l. c.* pp. 64–66, pls. xxi. & xxii.

Calanoides, g. n. Distinct from *Calanus* by the want of a mandible in the male; fifth pair of feet in the same as in *Euchæta*. *C. patagoniensis*, sp. n., South Pacific. *Id. l. c.* pp. 74 & 75, pl. xxiii. figs. 1–10.

Aetidius, g. n. Distinct from *Calanus* by the inner branches of the feet being one-jointed in the first, two-jointed in the second, three-jointed in third and fourth pair, fifth pair rudimentary in the male and absent in the female; rostrum strongly-hooked. *A. armatus*, sp. n., Southern Indian Ocean, Torres Straits, and Chinese Sea. *Id. l. c.* pp. 75 & 76, pl. x. figs. 5–16.

Drepanopus, g. n. The anterior four pairs of swimming feet as in *Aetidius*, but the fifth two-branched, prehensile, dissimilar on both sides, rudimentary in the female. *D. pectinatus*, Southern Indian Ocean, and *furcatus*, Southern Pacific and Mid Atlantic, spp. nn. *Id. l. c.* pp. 76–78, pls. iv. figs. 1 & 2, & xxiv.

Phyllopus, g. n. Anterior antennæ twenty-four-jointed; maxilla-palp rudimentary; inner branches of all the swimming feet (?) three-jointed, fifth pair in the male ? one-jointed, the last joint leaf-like. *P. bidentatus*, sp. n., South Atlantic. *Id. l. c.* p. 78, pl. v. figs. 7–16.

Diaptomus sicilis, *leptopus*, and *stagnalis*, spp. nn., and *sanguineus* (Forbes), Lake Michigan; Forbes, Am. Nat. xvi. [1882] pp. 541, 542, & 645–647, pl. viii. figs. 1–14 & 17–20.

Diaptomus castor (Jurine). A number of varieties observed in the Mississippi Valley from Lake Superior to the Gulf of Mexico; sometimes

only one stage in a pool and another in the next, only a few feet apart; intensity of colouration does not depend upon season but the condition of the water, which may or may not be influenced by the time of the year. *D. giganteus*, *sanguineus*, and *stagnalis* (Forbes) must all be referred to *D. castor*. *D. pallidus* (Herrick), with *sicilis* (Forbes), constitutes a second distinct species. Herrick, Am. Nat. xvii. pp. 381–383, pl. v. figs. 1–9.

Diaptomus ? *kentuckyensis*, sp. n., Chambers, J. Cincinn. Soc. iv. p. 49.

Diaptomus. Note on its development; B. Ssekely [title, *suprà*].

Osphranticum [see Zool. Rec. xix. *Crust.* p. 37] differs from *Diaptomus* by the fifth pair of legs in both sexes being biramose and armed with plumose cilia. *O. labro-nectum*, sp. n., Lake Michigan. Forbes, Am. Nat. xvi. [1882] p. 645, pls. viii. figs. 24, 28, & 29, & ix. figs. 1, 2, 4, 5, 7, & 9.

Epischura, g. n. Abdomen distorted, unsymmetrical, its last three segments being laterally produced into a grasping organ in the male; the lateral process of the two former acting against each other as a powerful pair of nippers, and the latter bearing a stout toothed plate. *E. lacustris*, sp. n., Lake Michigan. *Id. l. c.* pp. 540 & 647, pls. viii. figs. 15, 16, 21–23, & 25–27, & ix. fig. 8. Generic characters formulated, and *E. fluviatilis*, sp. n., also from North America, added; C. L. Herrick, *op. cit.* xvii. pp. 384 & 385, pl. v. figs. 10–20.

Acartia denticornis, sp. n., Brady, Copep. 'Challenger,' p. 73, pls. xxxi. fig. 1, & xxxii. figs. 12–17, sea near the Sandwich and Philippine Islands.

Corynura, g. n. Near *Candace*; right anterior antenna of the male provided with serrated plates; maxilla destitute of a palpus, composed of a stout setiferous base, and a slender one-jointed apical portion; foot-jaws near those of *Acartia*; caudal stylets much elongated and dilated at the tips. *C. gracilis* and *barbata*, spp. nn., sea off the Philippines. *Id. l. c.* pp. 70 & 71, pls. xxxi. figs. 10–12, & xxxiii.

Pontellopsis, g. n. Abdomen of female two-jointed, and having a pouch-like protuberance on the left side; primary branch of posterior antennæ three-jointed, secondary branch small, indistinctly four-jointed; mandible-palp composed of a moderately large basal joint and two small branches composed of several joints; male unknown. *P. villosa*, sp. n., Northern Pacific and Southern Atlantic. *Id. l. c.* pp. 85 & 86, pls. xxxiv. figs. 10–12, & xxxv. figs. 14–20.

Pontella (Dana), *Monops*, and *Labidocera* (Lubbock) cannot be kept as distinct genera; *P. lævidentata*, Philippines, *krøyeri*, Arafura Sea, and Philippines, *elephas*, Philippines, *inermis*, South Atlantic, and *securifer*, Mid Pacific, spp. nn.; *id. l. c.* pp. 87–96, pls. xxxviii., xxxix., & xlv. figs. 1–15.

[illegible] pl. [illegible]*ia*, g. n., Thomson, Tr. N. Z. Inst. xv. p. 93. Allied to *Isias* and *Centropages* (Krøy.), but all five pairs of swimming feet two-[illegible]ed; fifth pair with both branches three-jointed in the female, a[illegible] outer branch two-jointed in the male, with a long terminal curved claw. *B. tri-articulata*, sp. n., p. 94, pl. vi. figs. 1–9, Eyreton, N. Canterbury. The author adheres to the generic name, as Brady's *Boeckia* has lapsed.

Cyclopidæ.

Cyclops thomasi and *insectus*, spp. nn., Forbes, Am. Nat. xvi. [1882], p. 649, pl. ix. figs. 6, 10, 11, & 16, Lake Michigan.

Cyclops pectinatus, locality not given, *modestus*, Kentucky, and *tenuissimus*, Alabama, spp. nn., Herrick, Am. Nat. xvii. pp. 499 & 500, pls. v. figs. 21–25, vi. figs. 20 & 21, & vii. figs. 25–28.

Cyclops gigas (Claus), pl. ix. figs. 8–10, *C. serrulatus* (Fisch.), pl. xi. figs. 19–22, and *æquoreus* (Fisch.), pl. xi. figs. 16–18, all from Dunedin, and *C. chiltoni*, sp. n., p. 97, pl. ix. figs. 11–19, Eyreton, N. Canterbury; G. M. Thomson, Tr. N. Z. Inst. xv. pp. 96–98.

Oithona challengeri, sp. n., Pacific and Atlantic, Brady, Copep. 'Challenger,' p. 97, pl. xl. figs. 1–10.

Thorellia brunnea (Boeck) var. n. *antarctica*; Thomson, *l. c.* p. 95, pl. v. figs. 15–19, Otago Harbour, 7 fath.

Harpacticidæ.

Pseudothalestris, g. n. Like *Thalestris*, except the first pair of feet having its outer branch very short and only two-jointed, the inner branch long, three-jointed, the first joint very long. *P. imbricata*, sp. n., Betsy Cove, Kerguelen Island. Brady, Copep. 'Challenger,' p. 101, pl. xlii. figs. 1–8.

Machairopus, g. n. Intermediate between *Idya* and *Scutellidium*, the antennæ, foot-jaws, and mandibles agreeing with the former, while the feet are like those of the latter. *M. idyoides*, sp. n., Betsy Cove, Kerguelen; *id. l. c.* p. 104, pl. xli. figs. 1–12.

Pontostratiotes, g. n. Carapace armed with several excessively long and strongly-toothed spines, which are directed backward; anterior antennæ likewise provided with numerous various-shaped spine-like processes. *P. abyssicola*, sp. n., South Atlantic, 2000 fath., only one specimen. *Id. l. c.* p. 106, pl. xliv.

Goniopsyllus, g. n. Maxillæ and foot-jaws extremely small, mandibles wanting?; posterior antennæ without secondary branch; joints of the cephalothorax dilated behind, so as to form prominent lateral triangular processes. *G. rostratus*, sp. n., South Atlantic. *Id. l. c.* p. 107, pl. xlii. figs. 9–16.

Bradya limicola, sp. n., without pigmented eyes, in a slightly saline marsh at the shore of the Gulf of Mexico; Herrick, Am. Nat. xvii. p. 205; abstract in J. R. Micr. Soc. (2) iii. p. 211.

Tachidius? *fonticola*, sp. n., Chambers, J. Cincinn. Soc. iv. p. 47.

Amymome clausi, sp. n., Thomson, Tr. N. Z. Inst. xv. p. 9*mtal.*, v. figs. 1–8, Otago Harbour.

Diarthrodes, g. n., *id. l. c.* p. 99. *Canthocamptineæ*: for *D.[illegible]neus zealandiæ*, sp. n., *ibid.* pl. viii. figs. 15–22, Otago Harbour. [illegible] &

Merope||, g. n., *id. l. c.* p. 100 (and N. Z. J. Sci. i. p. 341). Same subfamily, very near *Cletodes* (Brady), but all the swimming legs different. *M. hamata*, sp. n., *ibid.* pl. x. figs. 22–27, Dunedin.

Laophonte australasica[*-iaca*], sp. n., Thomson, *l. c.* p. 101, pl. xi. figs. 1–10, Dunedin ; ? = *L.* (*Cleta*) *forcipata* (Claus).

Dactylopus tisboides (Claus) from Dunedin ; *id. l. c.* p. 102.

Xouthous, g. n., *id. l. c.* p. 103. *Harpactineæ* : ? = *Dactylopus*, subg., but with different structure of mandibles and first and fifth pairs of feet. *X. novæ-zealandiæ*, sp. n., *ibid.* pl. x. figs. 8–15, Dunedin.

Thalestris forficula (Claus) from Dunedin ; *id. l. c.* p. 104, pl. x. figs. 16–21.

Harpacticus bairdi (Thoms., = *chelifer*, Müll.) redescribed ; *id. l. c.* p. 105, pl. vi. figs. 12–16.

Peltidiidæ.

Zaus contractus, sp. n., Thomson, *l. c.* p. 106, pl. x. figs. 1–7, Otago.

Porcellidium fulvum, p. 107, pls. vi. figs. 10 & 11, & vii. figs. 8–13, Otago and Lyttelton, and *P. interruptum*, p. 108, pl. xi. fig. 15, Dunedin, *id. l. c.*, spp. nn.

Iaya furcata (Baird) from Dunedin ; *id. l. c.* p. 108, pl. viii. figs. 1–8.

Scutellidium tisboides (Claus) from Otago and Dunedin; *id. l. c.* p. 110, pl. vii. figs. 1–7.

Corycæidæ.

Corycæus limbatus, sp. n., Brady, Copep. 'Challenger,' p. 114, pl. xlix. figs. 18–22, Tropical Atlantic.

Saphirina reticulata, South Atlantic, *serrata*, Tropical Atlantic, and *sinuicauda*, Philippines, spp. nn., *id. l. c.* pp. 125 & 129, pls. xlix. figs. 1, 2, & 7–10, & li. figs. 12–14.

Notodelphyidæ.

Doryixys uncinata (Kerschner), Naples, in various species of *Didemnidæ* and *Aplidiidæ* ; Della Valle, Atti Acc. Rom. Trans. vii. p. 180.

Ascidiicolidæ.

Enterocola fulgens (Bened.) found in various species of *Aplidiidæ* and *Didemniidæ* at Naples, and described ; Della Valle, *ibid.*

Kossmechthrus, g. n. The pairs 1–4 of feet asymmetrical, the left being different from the right ; fifth pair situated dorsally ; it may perhaps form a new family. Naples, in the stomach of the compound Ascidian *Distoma pancerii* (Della Valle) ; Della Valle, Atti Acc. Rom. xv., pt. ; preliminary abstract, *op. cit.* Trans. vii. p. 180.

Ergasilidæ.

Ergasilus centrarchidarum, sp. n., on the gills of various fresh-water species of *Centrarchidæ*, Canada ; Ramsay Wright, P. Canad. Inst. i. p. 243, pl.

Ascomyzontidæ.

Conostoma, g. n., G. M. Thomson, Tr. N. Z. Inst. xv. p. 111. Nearly allied to *Artotrogus*, but differing completely in the structure of all the swimming feet. *C. elliptica*, sp. n., *id. l. c.* p. 112, pl. v. figs. 9–14, Otago.

Artotrogus baecki (Brady), from Otago, free, p. 113, pl. ix. figs. 1–7; *A. ovatus*, sp. n., *ibid.* pl. xi. figs. 11–13, Paterson Inlet: *id. l. c.*

Acontiophorus scutatus (Brady & Rob.) from Otago; *id. l. c.* p. 114, pl. viii. figs. 9–14.

Caligidæ.

Caligus pacificus, sp. n., Gissler, Am. Nat. xvii. p. 885, woodcut.

Lepimacrus, g. n. Cephalothorax shield-shaped, rather long, divided into a median and two lateral parts, with two large notches at its base; behind it four large plates; eyes separate; antennæ small, with a sucker near them; three pairs of feet, the first long, with a twisted claw and a sucker at its base, the second slender, didactyle, the third strong, with a hook-shaped claw. *L. jourdaini*, sp. n.: only the female known, coast of France, on *Lamna cornubica*. Hesse, Ann. Sci. Nat. (6) xv. Art. 3, pp. 6–10, 33, & 44, pl. iv. figs. 8–17.

Tæniacanthus, g. n. Near *Bomolochus*; first four segments of the thorax swollen, flattened above, separated by distinct constrictions, the last thoracic segment and the abdomen rudimentary; anterior antennæ 4-jointed, basal joint very long; two hooks on each side behind the second pair of antennæ; oral region surrounded by a cutaneous fringe; lower maxilliped with a large falciform claw; first pair of feet transformed into a broad natatory plate, its both branches 2-jointed, beset with feathered setæ at the distal margin, the basal joint peculiarly moveable; fifth pair of feet rudimentary, 2-jointed. *T. carchariæ*, sp. n., on the gills of *Carcharias lamia*. K. Sumpf, "Über eine neue Bomolochiden-Gattung." Inaug. Diss. Univ. Göttingen, Hildesheim: 1871, 8vo, 32 pp., 2 pls. [hitherto omitted].

Lepeophthirus suhmi, sp. n., Brady, Copep. 'Challenger,' p. 132, pl. lv. fig. 2, Cape Verde Islands, on a *Scarus*.

Nogagus spinacii [*spinacis*], sp. n., Hesse, Ann. Sci. Nat. (6) xv. Art. 3, pp. 1–6 & 29–32, pl. iv. figs. 1–7, coast of France, on *Spinax acanthias* (L.). Only female and young state known; the latter is provided with a very long frontal filament, by which it is attached to the body of an adult specimen.

Nogagus murrayi, sp. n., Brady, *l. c.* p. 136, pl. lv. fig. 1, Atlantic, taken in the open sea.

Cecrops achantii-vulgaris [!], sp. n., Hesse, *l. c.* pp. 26–29 & 37, pl. v. figs. 15–20, coast of France, on *Acanthias vulgaris*.

Pandarus spinacii-achantias [!], *P. cacharii-glaucas* [!], *P. unicolor*, and *P.* "*musteli-lævis*," spp. nn., *id. l. c.* pp. 10–26 & 35–37, pls. v. figs. 1–14, & iii., coast of France, on *Spinax acanthias*, *Carcharias glaucus*, *Galeus vulgaris*, and *Mustelus lævis*.

Pandarus zygænæ, sp. n., Brady, *l. c.* p. 134, pl. lv. fig. 3, Cape Verde Islands, on *Zygæna malleus*.

Dichelestidæ.

Hesiella, g. n. Body much elongated, cylindrical, cephalothorax not much more tumid, but longer, than the abdomen, which terminates in two blunt adpressed lobes, each bearing three small setæ; anterior antennæ very small, indistinctly 5-jointed, and densely setose; posterior small, but stout and hamate; four pairs of swimming feet, the branches all 2-jointed, first and second pairs 2-branched, third and fourth 1-branched. *H. cylindrica*, sp. n., Zamboanga. Brady, *l. c.* p. 136, pl. lv. figs. 9–13.

Antheacheridæ.

Philichthys daderleini, sp. n., in mucous channels at the base of the head of *Labrus turdus* (Bl.); Ricchiardi, P.-v. Soc. Tosc. 1883, p. 279, and Zool. Anz. 1883, p. 558.

Lernæidæ.

Lernæa abyssicola, sp. n., Brady, *l. c.* p. 137, with woodcut, N. Atlantic, on *Ceratias uranoscopus*, from 2400 fath.

Chondracanthidæ.

Chondracanthus? macrurus, sp. n., Brady, *l. c.* p. 137, pl. lv. figs. 4–8, off Kermadec Islands, on a *Macrurus*, 600 fath.

Lernæopodidæ.

Achtheres micropteri, sp. n., Ramsay Wright, P. Canad. Inst. i. p. 243, pl., on *Micropterus*, Canada.

CIRRIPEDIA.

General notes on literature and geographical distribution, and analytical tables of the known species of *Lepas*, *Pœcilasma*, *Dichelaspis*, *Alepas*, *Scalpellum*, *Verruca*, *Tetraclita*, and *Chthamalus*, by P. P. C. Hoek, in Rep. Sci. Results of the Voy. of H.M.S. 'Challenger,' Zoology, viii. pp. 1–169, pls. i.–xiii.

Lepadidæ.

Pœcilasma carinatum, sp. n., West Indies and near Ascension, 390–420 fath., and *gracile*, sp. n., off Sydney, 410 fath., Hoek, *l. c.* pp. 44–46, pls. i. figs. 8–10, ii. figs. 1–4, & vii. figs. 6 & 7.

Megalasma, g. n. Near *Pœcilasma*; scuta triangular, with their umbones at a considerable distance from the rostral angle, carina extending

only to the basal points of the terga, with its lower end truncated and very wide. *M. striatum*, sp. n., Philippine Archipelago, 100 and 115 fath., on the spines of an Echinus. Hoek, *l. c.* pp. 50–53, pls. ii. figs. 5–9, & vii. figs. 8 & 9.

Dichelaspis sessilis, sp. n., *id. l. c.* p. 48, pl. ii. figs. 10–12, Atlantic, near the Azores, 1000 fath.

Alepas pedunculata, sp. n., *id. l. c.* p. 57, pls. iii. figs. 1–5, & vii. figs. 10 & 11, off New South Wales, 410 fath., on the spines of *Phormosoma hoplacantha*.

Pollicipedidæ.

From the materials brought home by the 'Challenger,' P. P. C. [illegible] pp. 98 & 99, traces the life-history of the males of *Scalpellum* as f[illegible]— Either all species of *Scalpellum*, or at least those inhabiting the [illegible] sea, have lost the Nauplius- as a free-swimming larval stage. After tr[illegible] metamorphosis into the Cypris-stage, some of them become attached to the interior side of the scutum of a female species, near the occludent margin. Whereas in shallow-water species, these Cypris-larvæ develop into a small male animal, with a distinct capitulum and peduncle, in many deep-sea species they develop by retrogressive metamorphosis into a male of a much more rudimentary nature. Neither in the first nor in the second case is unisexuality observed in a stage corresponding to the Cypris-stage of the ordinary development.

Scalpellum marginatum and *ovatum*, North of New Guinea, 2000 fath., *japonicum*, Japan, 565 fath., *insigne*, North Atlantic, 1525 fath., *intermedium*, off Sydney and Auckland, 410 and 700 fath., *trispinosum*, Philippines, 82 and 102 fath., *carinatum*, Tristan d'Acunha, 1000 fath., *recurvirostrum*, Southern Indian Ocean, 150 fath., *compressum*, Celebes Sea, 2150 fath., *acutum*, North Atlantic and Australia, 520–1000 fath., *breve-carinatum*, Southern Indian Ocean, 1375–1600 fath., *parallelogrammum*, South Atlantic, 600 fath., *album*, South of Mindanao, 500 fath., *africanum*, near Tristan d'Acunha, 100 fath., *hirsutum*, Moluccan Sea, 825 fath., *nympho-*[*ni*]*cola*, North Atlantic, on the legs of *Nymphon robustum* (Bell), 540–640 fath., *rubrum*, near Luzon, 100 and 115 fath., *truncatum*, New Guinea, 1400 fath., *elongatum*, Tristan d'Acunha, Sydney and Auckland, 60–1100 fath., *antarcticum*, Southern Indian Ocean, lat. 65° S., 1675 fath., *velutinum*, North and South Atlantic, 900 and 1425 fath., *pedunculatum*, New Zealand, 150 fath., *eximium*, off Tristan d'Acunha, 1000 fath., *gigas*, Mid Pacific, 2050 fath., *moluccanum*, Banda Sea, 1425 fath., *regium* (Wyville-Thomson, MS.) with var. *ovale*, North Atlantic, 2750–2850 fath., *darwini*, capitulum about 46 mm., South Pacific, 2160 fath., *distinctum*, New Britain, 1070 fath., *minutum*, South Pacific, 1450 fath., *abyssicola*, North Pacific, 2050 fath., *vitreum*, Japan, 1875 fath., *planum*, South of Australia, 2600 fath., *australicum*, between New Guinea and Australia, 1400 fath., *tenue*, near Crozet Islands, 1375 fath., *indicum*, Banda Sea, 129 fath., *tritonis*, Färoe Channel, 316 fath., *novæ-zealandæ*, New Zealand, 700 fath., *dubium*, New Guinea, 1400 fath., *flavum*, Southern Indian Ocean, 1375 fath., *balanoides*, Banda Sea, 129 fath., and *triangulare*, South Atlantic,

600 fath., spp. nn., with an analytical table of all known species; Hoek, *l. c.* pp. 59–132, pls. iii.–xi.

Balanidæ.

Balanus socialis, Arafura Sea, 28 fath., *rostratus*, Japan, 8 and 50 fath., *tenuis*, Philippines, 100 and 115 fath., *corolliformis*, Southern Indian Ocean, 150 fath., and *hirsutus*, North Atlantic, 116 fath., spp. nn., Hoek, *l. c.*, pp. 150–159, pl. xiii.

Chthamalus challengeri, sp. n., *id. l. c.* p. 165, pl. xiii. figs. 35–38, from the screw of H.M.S. 'Challenger.'

Verrucidæ.

Verruca gibbosa, South Atlantic, 1035 fath., *nitida*, South of Mindanao, 500 fath., *sulcata*, off Kermadec Island, 520–630 fath., *quadrangularis*, South Atlantic, 1900 fath., *incerta*, South Atlantic, 1425 fath., and *obliqua*, North Atlantic, 1525 fath., spp. nn., Hoek, *l. c.* pp. 132–144, pls. xi. & xii.

Cryptophialidæ.

Cochlorine bihamata, sp. n., Noll, Zool. Anz. 1883, pp. 471 & 472, found in a species of *Haliotis* from the Cape.

Ascothoracidæ.

Laura gerardiæ (Lac.-Duth.; see Zool. Rec. xvii. *Crust.* p. 60) fully described by Lacaze-Duthiers in Mém. Ac. Sci. xlii. [1882] 160 pp., 8 pls., also separately.

Peltogastridæ.

Yves Delage states that *Sacculina* lives in its younger stage in the abdomen of the crab, between the intestine and the wall of the body; it is there found complete with its sac, ovaries, accessory glands, testes, and nervous system, and it is only by increasing in size that it produces by compression necrosis of the integuments of the crab, thinning and finally rupturing them, to break through to the outside. Shortly afterwards, complementary males in the shape of *Cypris* attach themselves to it, usually two to five to one adult. C.R. xcvii. pp. 961–964, 1012, & 1145–1148; note by Lacaze-Duthiers, *tom. cit.* pp. 1148–1151; abstract in Ann. N. H. (5) xii. pp. 423–426.

XIPHOSURA.

Stigmata corresponding to the respiratory stigmata in the *Arachnida* observed in *Limulus*; E. R. Lankester, P. R. Soc. xxxii. pp. 214 & 391–398.

The brick-red coxal glands of *Limulus* are homologous to those of

Scorpio, and the tubular glands (Nephrida) at the base of each leg in *Peripatus*; E. R. Lankester, *l. c.*

The minute structure of the eyes of *Limulus* is the subject of a paper by E. R. Lankester & A. G. Bourne, who come to the conclusion that this genus belongs to the Arachnids; Q. J. Micr. Sci. xxiii. pp. 177–212, 3 pls.

Limulus polyphemus. The male differs from the female in the shape of the claws and position of the genital orifices; the latter difference exists even in the very youngest, the former only in the well-grown male. The females reach a breadth of ten to twelve inches, the males only of eight to ten inches. The increase in size at the time of shedding is remarkable, the length of the carapace increasing at one moult in very young ones from 2 to 3 mm. and from 3 to 4.2 mm., in a specimen about one year old from 11.5 to 20 mm. B. F. Koons, Am. Nat. xvii. pp. 1297–1299.

A. S. Packard describes the moulting of *Limulus polyphemus*; not only the outer shell, including all the spines and hairs, but also the chitinous lining of the œsophagus and proventriculus (the stomach of most authors), and the seven pairs of apodomes, are shed: Am. Nat. xv p. 1075; abstract in J. R. Micr. Soc. (2) iii. p. 836.

The question of Willemoës-Suhm's supposed larva of *Limulus* [Zool. Rec. xix. *Crust.* p. 39] is also treated in Q. J. Micr. Sci. xxiii. pp. 145–156.

MYRIOPODA.

BY

T. D. Gibson-Carmichael, M.A., F.L.S.

The General Subject.

1. Balbiani, E. G. Sur l'origine des cellules du follicule et du noyau vitellin de l'œuf chez les Géophiles. Zool. Anz. vi. pp. 658–662 & 676–680.

A description, with illustrations, of certain remarkable peculiarities of structure in the ovum of *Geophilus longicornis* and *G. carpophagus*. The cells of the follicle and the yelk-nucleus seem to Balbiani to be derived from the germinal vesicle and the germinal spot.

2. Balfour, F. M. Existence of a Blastopore and Origin of the Mesoblast in *Peripatus*. P. R. Soc. xxxiv. pp. 390–393; abstract in J. R. Micr. Soc. (2) iii. pp. 52 & 53.

A preliminary note on Balfour's discoveries as to the embryology of *Peripatus capensis* was communicated to the Royal Society. In the discussion following the communication, Professor Ray Lankester said that the view that the blastopore represents an ancestral mouth must be given up; it is probably an aperture produced in the formation of the hypoblast by invagination, and never has any special function.

3. ——, Moseley, H. N., & Sedgwick, A. The Anatomy and Development of *Peripatus capensis*. Q. J. Micr. Sci. (n. s.) xxiii. pp. 213–259, pls. xiii.–xx.; abstracts in J. R. Micr. Soc. (2) iii. pp. 366 & 367, and in Am. Nat. xvii. pp. 882–884.

A full description is given of the anatomy of the species. Five stages in the development of the embryo are described and figured. The more important results of the early development are thus summarized:— 1. The greater part of the mesoblast is developed from the walls of the archenteron. 2. The embryonic mouth and anus are derived from the respective ends of the blastopore, the middle part of the blastopore closing up. 3. The embryonic mouth almost certainly becomes the adult mouth, *i.e.*, the aperture leading from the buccal cavity into the pharynx, the two being in the same position. The embryonic anus is in front of the position of the adult anus, but in all probability shifts back and persists as the adult anus. 4. The anterior pair of mesoblastic somites gives rise to the swellings of the præoral lobes, and to the mesoblast of the head.

. Berlese, A. Acari, Miriapodi, e Scorpioni italiani. Padova: 1882–83 (plates). Abstract in Bull. Ent. Ital. xv. p. 193.

A new species of *Lysiopetalum*, *L. sicanum*, is described.

5. Canestrini, R. Alcune osservazioni sulla decapitazione degli Insetti e dei Miriapodi. Bull. Soc. Ven.-Trent. ii. pp. 119–125; abstracts in Bull. Ent. Ital. xv. p. 189, and in J. R. Micr. Soc. (2) iii. pp. 645 & 646.

A few experiments were made on Myriopods. The presence of damp earth was found to prolong the duration of movements after decapitation. Both body and head of *Scolopendra* have been found to move eight days after having been separated from each other. *Geophilus* shows no signs of inconvenience after being deprived of its head; specimens have lived for ten days after the operation. *Iulus* continues to move its legs, especially the terminal joints, for seven days, and the antennæ for forty-eight hours, after the head has been separated from the body.

6. Chatin, J. Observations morphologiques sur les origines de l'artère récurrente chez les Myriapodes. Bull. Soc. Philom. (7) vii. pp. 112–114.

7. Cope, E. D. A Myriopod which produces Prussic Acid. Am. Nat. xvii. p. 337.

Commenting on Guldensteeden-Egeling's discovery of prussic acid in a species of *Fontaria* inhabiting hothouses in Holland, Cope mentions that a common Pennsylvanian Myriopod, *Fontaria virginica*, emits a strong odour of prussic acid.

8. Forbes, S. A. *Scolopendrella* in Illinois. Am. Nat. xvii. p. 91.

A specimen of *S. immaculata* found amongst the roots of corn.

9. Gibson-Carmichael, T. D. Note on the Occurrence of *Lithobius variegatus*, Leach, in Scotland. P. Phys. Soc. Edinb. vii. p. 240.

This species is found abundantly at Inverary, in the Island of Colonsay, and in other localities throughout the west of Scotland.

10. ——. *Scutigera* (*Cermatia*) *coleoptrata* near Aberdeen. Ent. M. M. xx. p. 88.

S. coleoptrata occurs in a paper mill near Aberdeen, having probably been introduced in bundles of rags from the south of Europe.

11. Haase, Erich. Das Respirationssystem der Symphylen und Chilopoden. Zool. Anz. vi. pp. 15–17.

Scolopendrella has two stigmata situated on the under side of the head, beneath the base of the antennæ. From these a tracheal stem, whose walls have not spiral thickenings, runs backwards as far as the base of the head, where it breaks up into a system of air-tubes, supplying the fore part of the body. The chitinous tubes which Ryder has described are not, in Haase's opinion, breathing organs at all. The tracheal systems of *Scutigera*, *Lithobius*, *Cryptops*, *Scolopendra*, and *Himantarium* are briefly described. From their structure, Haase concludes that the tracheal system of the Chilopods shows with the greatest clearness that the highest development of the breathing system, that which approaches most nearly to the breathing system of insects, is found in the forms having many body-segments (*Scolopendridæ* and *Geophilidæ*), his *Chilopoda Epimorpha*, thus furnishing him with another proof of their natural separation from the forms with few body-segments, his *Chilopoda Anamorpha*.

Karlinski, Justyn. Materyjaly do fauny wijow Galicyj zachodniej z. r. 1878–1882. Sprawozd. kom. fizyogr. xvii. pp. (226)–(238).

60 known species.

13. Kennel, J. Von. Entwickelungsgeschichte von *Peripatus*. Zool. Anz. vi. pp. 531–537. Translation in Nature, xxix. p. 92. Remarks thereon by Moseley & Sedgwick, Nature, xxix. p. 196. Abstract in J. R. Micr. Soc. (2) iii. pp. 833–835.

Observations have been made on *Peripatus edwardsi*, and on a new species, *P. torquatus*, from Trinidad; the latter is the largest species yet known. The uterus always contains embryos in every stage of development, which seems to show that the female is only impregnated once. The ovum contains no yelk, but the embryo is nourished by a placenta and pedicle attaching it to the uterine epithelium. Von Kennel's conclusions as to the relations of the embryonic and adult mouth and anus, and as to the origin of the mesoblast, are widely different from Balfour's.

14. Kirk, T. W. Habitat of *Peripatus novæ-zelandiæ*. N. Z. J. Sci. i. p. 573.

Lists of localities where *P. novæ-zelandiæ* has hitherto been found in New Zealand.

15. Latzel, R. Beitrag zur Myriopoden-Kenntniss Österreich-Ungarns und Serbiens. Verh. z.-b. Wien, xxxii. pp. 281 & 282.

5 new species are described—*Glomeris carpathica* and *Polydesmus tatranus*, Mountains of Gallicia and Hungary, *Craspedosoma carpathicum*, *Lysiopetalum fasciatum*, and *Iulus strictus*, Hungary and Servia.

16. Lucas, H. Note sur le *Blaniulus guttulatus*. Ann. Soc. Ent. Fr. (6) iii. pp. lxv. & lxvi.

17. Meinert, F. Caput *Scolopendræ*. The Head of the *Scolopendra* and its Muscular System. Copenhagen: 1883, 4to, 77 pp., 3 pls.

The author describes carefully the external anatomy of the head of *Scolopendra subspinipes*, Kohlr., a species which he considers typical of the Chilopods. Newport's view, generally adopted in England, that the head of a Chilopod consists of eight subsegments, is disproved. The views of forty-six authors on the morphology and nomenclature of the mouth-parts are given in a tabular form, and criticized by Meinert. He himself gives a new explanation and a new nomenclature of these parts. He thinks he has proved that the mouth-parts of *Scolopendra* and of biting insects are homologous. He does not consider the antennal segment and antennæ as homologous with the mouth-segments and their appendages. The details have been worked out carefully, but had Meinert paid more attention to embryology, it seems that he would have had to admit that the antennal segment and the antennæ are homologous with the other segments and their appendages. Meinert denies any ventral part to the lamina cephalica, but Sograff, in his memoir on *Lithobius* (Moscow: 1880), seems to have proved that in the Chilopods the alimentary canal does at first open as a mouth in the antennal segment, moving back at a later stage into the mandibular segment, while the antennæ originate in the same manner as the maxillæ and mandibles.

MOSELEY, H. N. [See BALFOUR (2), and KENNEL (13).]

18. PACKARD, A. S. The Systematic Position of the *Archipolypoda*, a Group of Fossil Myriopods. Am. Nat. xvii. pp. 326–329 (illustrated); abstract in J. R. Micr. Soc. (2) iii. pp. 365 & 366.

A study of the *Lysiopetalidæ* has induced Packard to think that Scudder was wrong in regarding the *Archipolypoda* as a group equal in rank to *Diplopoda*. Scudder seems to have had too exclusive a regard to the *Iulidæ* when considering the *Diplopoda*. The Order of *Diplopoda*, Packard thinks, ought to be divided into two suborders, the lower, more larval, and extinct group being the *Archipolypoda*, and the higher group being the genuine Chilognaths.

19. ——. A New Species of *Polydesmus* with Eyes. Am. Nat. xvii. pp. 428 & 429; abstract in J. R. Micr. Soc. (2) iii. p. 367.

At Portland, in Oregon, Packard has found what he considers a *Polydesmus* with eyes. It might be easily mistaken for a *Trichopetalum*. 12–13 black ocelli are present. He proposes to name it *Polydesmus ocellatus*. This species seems to be really a species of *Chordeuma*.

20. ——. Repugnatorial Pores in the *Lysiopetalidæ*. Am. Nat. xvii. p. 55.

These are distinct in *L. carinatum*, Brandt; in *L. illyricum*, Latzel, they are indistinct. In the cave-inhabiting *Pseudotremia cavernarum*, they seem to be obsolete, not being required as a means of self defence.

21. ——. Note on a *Peripatus* from the Isthmus of Panama. Am. Nat. xvii. pp. 881 & 882.

A species allied to, if not identical with, *P. edwardsi*, Blanchard.

22. ——. The Structure and Embryology of *Peripatus*. Am. Nat. xvii. pp. 882–884.

An abstract, with criticisms, of Balfour's memoir.

23. ——. A Revision of the *Lysiopetalidæ*, a Family of Chilognath *Myriopoda*, with a Notice of the Genus *Cambala*. P. Am. Phil. Soc. xxi. pp. 177–197; abstract in J. R. Micr. Soc. (2) iii. p. 832.

The following synopsis of genera is given :—

A. Body not setose; antennæ long; male legs of eighth pair not modified; genital armature of normal proportions.	*Lysiopetalum*, Brandt.
Male legs of eighth pair modified, six-jointed; genital armature small . .	*Pseudotremia*, Cope.
B. Body setose.	
Body short and thick, eyes triangular; antennæ slender; setæ one-fifth as long as body is thick; legs short. .	*Cryptotrichus*, g. n.
Body short and fusiform, eighth pair of legs of male two-jointed; setæ half as long as body is thick . . .	*Trichopetalum*, Harger.
Body slender; eighth pair of male legs two-jointed, end in a claw; setæ very long; eyeless.	*Scoterpes*, Cope.

Like *Scoterpes*; setæ a little shorter; sixth pair of male legs greatly swollen . . . . . *Zygonophus*, Ryder.

Descriptions and synonymy of 8 species native to America are given. *Cambala annulata*, Cope, is described

24. [Packard, A. S.]. On the Morphology of the *Myriopoda*. P. Am. Phil. Soc. xxi. pp. 197–209 (figs.); abstract in J. R. Micr. Soc. (2) iii. p. 833.

Embryology and morphology prove that the *Chilognatha* are the representatives of the primary form of the Myriopods, the *Chilopoda* being a less primitve group. Two pairs of head appendages found in the latter have no representative in the former. Packard proposes to call them Malipedes. He gives the following table showing the relations of the head parts in three sub-classes of tracheate Arthropods :—

	Hexapoda.	*Arachnida.*	*Chilopoda.*	*Chilognatha.*
1st Arthromere (pre-oral)	Antennæ	Wanting	Antennæ	Antennæ
2nd Arthromere (post-oral)	Mandibles	Cheliceræ	Protomalæ	Protomalæ
3rd Arthromere	1st Maxillæ	Pedipalpi	Deutomalæ	Deutomalæ
4th „	2nd „	1st pair of Bænopoda	1st Mali-pedes	1st pair of Pedes
5th „	2nd „	2nd pair of Bænopoda	2nd Mali-pedes	2nd pair of Pedes
6th „	1st pair of Bænopoda	3rd pair of Bænopoda	1st pair of Pedes	3rd pair of Pedes

The Myriopod must have branched off from the tracheate stem by an ancestor much more primitive than *Scolopendrella*, which form Packard considers to be really a Hexapod allied to, but earlier than, *Campodea*. *Pauropus*, he thinks, should be looked on as a suborder of the *Chilognatha*, *Eurypauropus* connecting *Pauropus* with *Polyxenus*. Scudder's fossil *Palæocampa*, Packard thinks, is not a Myriopod, but a larval form of an insect allied to *Panorpidæ*.

25. Schlechtendal, D. H. R. von. Ueber das Nestbauen von *Polydesmus complanatus*, Deg. Z. Naturw. (4) ii. pp. 223–225.

The female *Polydesmus complanatus* covers eggs with damp earth and moss in the form of a little ball.

26. Scudder, S. H. Remarks on *Scolopendrella* and *Polyxenus*. P. Bost. Soc. xxii. pp. 64–67.

Describes a *Scolopendrella* found near Boston, proposing the name of *S. latipes* for it from the character of its feet. Also describes *Polyxenus fasciculatus*, Say, particularly noticing the tegumentary appendages.

27. ——. Dermal Appendages of *Polyxenus*. P. Bost. Soc. xxii. p. 67; abstract in J. R. Micr. Soc. (2) iii. p. 501.

A minute description of the different forms of hairs of *P. fasciculatus*, Say.

Sedgwick, A. [See Balfour (2) and Kennel (13)].

28. Whittell, H. Rawes. On the Voracity of a Species of *Heterostoma*. P. Linn. Soc. N. S. W. viii. pp. 33 & 34.

29. Wood-Mason, J. Notes on the Structure, Post-embryonic Development, and Systematic Position of *Scolopendrella*. Ann. N. H. (5) xii. pp. 53–63.

Scolopendrella seems to be more nearly related to the *Chilognatha* than to the *Chilopoda*. It appears to be "the descendant of a group of Myriopods, from which the *Campodeæ*, *Thysanura*, and *Collembola* may have sprung, looking upon the three latter groups as the living representatives of the extinct stock from which the various orders of insects have originated." *Scolopendrella* presents several features of *Peripatus*—two-clawed feet and segmental organs. These latter are what Ryder thought were breathing organs. The trachea are without spiral thickenings in their walls. Fresh somites appear to be intercalated at each moult between the antepenultimate and penultimate sterna.

The following memoirs have not been seen by the Recorder :—

30. Cotta, B. Ueber *Iulus terrestris* als jugendliche Versteinerung. JB. Mineral. 1883.

31. Tömösváry, O. Adatok a Scolopendrellák ismeretéhez. Kolozsvári Orvos-természettudományi Értesitö, ix. 1, pl. i.

A new species, *Scolopendrella anacantha*.

32. Uličný, J. Bericht über bei Brünn gesammelte Myriopoden. Verh. Ver. Brünn. xxii.

33. Zograff, N. J. Materialen zur Kenntniss der Embryologisch Entwicklungs von *Geophilus ferrugineus* und *Geophilus proximus*. Arbeiten des Laborator. b. zool. Museum der Moskauer Univers. ii.

For Atkinson's notes on *Myriopoda* of the North-western Provinces of India, see *Insecta*, p. 1.

New Genus and Species.

Cryptotrichus, Packard (23).
Scolopendrella anacantha, Tömösváry (31).
Scolopendrella latipes, Scudder (26), near Boston, U.S.A.
Glomeris carpathica, Latzel (15), Gallicia and Hungary.
Polydesmus tatranus, Latzel (15), Gallicia and Hungary.
Polydesmus (*Chordeuma*?) *ocellatus*, Packard (19), Oregon.
Craspedosoma carpathicum, Latzel (15), Servia.
Lysiopetalum sicanum, Berlese (4), Italy.
Lysiopetalum fasciatum, Latzel (15), Servia and Hungary.
Iulus strictus, Latzel (15), Servia and Hungary.
Peripatus torquatus, Von Kennel (13), Trinidad.

INSECTA.

THE GENERAL SUBJECT.

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

Allen, G. The Colours of Flowers as Illustrated in the British Flora; with illustrations. London: 1882, 8vo. pp. 119. (*Cf.* H. Müller, Biol. Centralbl. iii. pp. 289–291.)

Contains casual references to Insects.

Atkinson, E. T. Notes on the Zoology of the North-Western Provinces of India (Allahabad: 1882, 8vo, woodcuts). Extracted in anticipation from the author's Memoir, "The Himálayan Districts of the North-Western Provinces of India," ii., of which vol. i., forming vol. x. of the Gazetteer of the North-Western Provinces, was published in 1882.

Includes *Arachnida*, *Insecta*, and *Myriopoda* (pp. 90–266). The introductory remarks, sketches of neuration, bibliographical notes, &c., will be most valuable to residents in India.

Bairstow, S. D. Natural History Notes from South Africa. Naturalist, viii. pp. 89–93, 102–106, 119–122, 128, & 166–171.

A rambling paper, containing notices of Insects observed.

Baynes-Reed, E. General Index to the Thirteen Annual Reports of the Entomological Society of the Province of Ontario, 1870–82. Prepared for the Honourable the Commissioner of Agriculture by the Society. Toronto: 1883, 8vo, pp. 35.

Bellevoye, A. Notes sur quelques Coléoptères et Hémiptères nouveaux ou rares pour le département de la Moselle. Bull. Soc. Metz (2) xiv. [1876] pp. 171–180.

Bellonci, G. Sur la structure et les rapports des lobes olfactifs dans les Arthropodes supérieurs et les Vertébrés. Arch. Ital. Biol. iii. pp. 191–196.

The *Arthropoda* studied were *Squilla* and *Gryllotalpa*. The structure of the olfactory organs is very similar in these animals and in *Vertebrata*.

Bennett, A. W. On the Constancy of Insects in their Visits to Flowers. J. L. S. xvii. pp. 175–185. [*Cf.* Zool. Rec. xix. *Ins.* p. 1.]

Includes the results of sixty-six observations on *Rhopalocera*, *Syrphidæ*,

and *Apidæ*. The *Lepidoptera* observed paid seventy visits to red or pink flowers, five to blue, fifteen to yellow, and five to white; *Diptera*, nine to red or pink, eight to yellow, and twenty to white; *Hymenoptera*, three hundred to red or pink, one hundred and twenty to blue, eleven to yellow, and seventeen to white.

BRAUER, F. Biologisches aus der Insectenwelt. Schr. nat. Kenntn. xxii. pp. 485–497.

A popular article, but containing noteworthy observations on the general conditions of Insect life.

BREHM, A. E. Merveilles de la Nature; les Insectes, les Myriapodes, les Arachnides et les Crustacés. Édition française par J. Künckel d'Herculais. Paris: 8vo, pp. 720, figs.

BRONGNIART, C. Aperçu sur les insectes fossiles en général, et observations sur quelques insectes des terrains houillées de Commentry (Allier, France). Le Nat. v. pp. 266–268.

Insects are much more common in the coal measures than is generally supposed. The writer's investigations lead him to the following conclusions:—(1) Insects have existed since the Devonian period. (2) At the Carboniferous period they were represented by forms allied to the *Orthoptera*, *Neuroptera*, and *Hemiptera* (*Fulgoridæ*). (3) Palæozoic Insects (except, perhaps, two supposed *Coleoptera*) were Insects with incomplete metamorphoses. (4) Insects only began to differentiate in the Secondary period. (5) During the Tertiary period, Insects differed little from those now existing, but those which then inhabited Europe are now only represented in warm climates.

CAMERANO, L. Ricerche intorno alle aberrazioni di forma negli animali, ed al loro diventare caratteri specifici. Atti Acc. Tor. xviii. pp. 459–478, pl. v.

The writer classifies the principal forms of aberration as follows:—

A. *Aberrations of Form.*

1. Aberrations of dwarfishness (nanism).
2. „ abnormal size (gigantism).
3. „ symmetry.
4. „ asymmetry.

B. *Aberrations of Colour.*

1. Aberrations by deficiency (achroism).
2. „ excess (hyperchroism).
3. „ symmetry.
4. „ asymmetry.

Aberrations may be useful to the animal either under normal conditions of life, or under new or accidental conditions, either favourable or the reverse. Sexual and accidental variations of form are then discussed, chiefly with reference to various *Coleoptera*, portions of various species of *Geotrupes*, *Onthophagus*, *Lucanus*, *Psalicerus*, *Megasoma*, *Brocus*, *Athous*, *Ocypus*, *Cerocoma*, and *Clitra*, being figured in illustratio

along with an abnormal *Attacus pernyi*, &c. The remarks on colour-variation are of a purely general character.

Canestrini, R. Alcune osservazioni sulla decapitazione degli Insetti e dei Miriapodi. Bull. Soc. Pad. ii. pp. 119–125. (*Cf.* J. R. Micr. Soc. 2, iii. pp. 145 & 146.)

Relates to the effects of decapitation, and the length of time that various Insects survived it.

Chatin, J. Sur les noyaux d'origine du stomato-gastrique chez les Insectes. Bull. Soc. Philom. (7) vii. pp. 135–138.

The writer confirms the observations of Blanchard (Ann. Sci. Nat. 3, v. [1846] p. 291). The structures in question are more easily examined in *Hymenoptera* than in other Insects.

Christy, R. M. On the Methodic Habits of Insects when Visiting Flowers. J. L. S. xvii. pp. 186–191. (*Cf.* also Ent. xvi. pp. 145–150 & 177–181.)

A tabulation of the visits of 76 hive-bees, *Lepidoptera*, and humble-bees to 2,400 flowers. The *Lepidoptera* were more constant in their visits to the same flower than were those observed by Bennett. The sight of bees is apparently good for short distances only, and they will sometimes visit the same flower more than once. Sometimes an insect will visit indiscriminately different coloured flowers of the same species. So far as the writer's observations go, humble-bees appear to be more methodic when visiting blue flowers than those of other colours.

Cooke, M. Injurious Insects of the Orchard, Vineyard, Field, Garden, Conservatory, Household, Storehouse, Domestic Animals, &c., with remedies for extermination. Sacramento: 1883, woodcuts. (*Cf.* Am. Nat. xvii. p. 1291.)

[Not seen by the Recorder.]

Dewitz, H. Die Befestigung durch einen klebenden Schleim beim Springen gegen senkrechte Fläschen. Zool. Anz. vi. pp. 273 & 274.

An adhesive secretion is of great importance to leaping insects, and other animals, as it prevents them from falling when alighting on a smooth or sloping surface.

Dimmock, G. On some Glands which Open Externally in Insects. Psyche, iii. pp. 387–404.

The odour of the larva of *Attacus cecropia* is due to a fluid which exudes from the tubercles when the brittle hairs upon the latter are broken. This is analogous to the stinging apparatus of the larvæ of various *Bombyces*, while in those of the *Pterophoridæ* a fluid exudes from the tips of the hairs. The foot glands of *Musca*, the stings of bees, the retractile organs of the larvæ of *Harpyia* and *Papilio*, and the exudation from the joints of the legs of various *Coleoptera*, are likewise referred to. A rather full bibliography of the subject is appended.

Duchalais, J. Animaux et Insectes nuisibles de la Sologne. Romorantin: 1883, 8vo, pp. 23.

Ellison, S. T. Mimicry in Insects. P. Perthshire Soc. i. pp. 105–110.

A general article.

Fabre, J. H. Nouveaux souvenirs entomologiques. Etudes sur l'instinct et les mœurs des insectes. Paris: 1882, pp. 349. (Reviewed in Ent. M. M. xx. p. 43.)

Relates chiefly to the habits, instincts, and metamorphoses of various *Hymenoptera* and *Coleoptera*. The first chapter gives a sketch of the Insects frequenting a waste plot of ground, covered with weeds, which goes by the local name of 'harmas.' Chapter ii. is devoted to the *Tarentula*. In chapter x. (pp. 157–178), various experiments to test the intelligence of Insects are described, in addition to others elsewhere related, which will be noticed under the genera of Aculeate *Hymenoptera*, to which they refer. Chapter xiii. (pp. 226–261) contains a list of the *Hymenoptera* and *Coleoptera* frequenting the bramble, with notes on the habits of several of the former, more especially *Osmia tridentata*, Duf. & Perr.

Failla-Tedaldi, L. Insetti Commestibili, Sacri, Medicinali, e d'Ornamento (continued). Nat. Sicil. ii. pp. 91–94.

Forbes, S. A. The Regulative Action of Birds upon Insect Oscillations. Bull. Illin. Lab. N. H. vi. pp. 3–32.

A number of birds frequenting an orchard much infested with insects were shot, and the contents of their stomachs carefully examined, in order to ascertain the proportion of various insects eaten. The results are given in great detail, and tabulated, *Anisopteryx vernata* being preferred by most birds.

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. xxi.–xxviii.

The portion published in 1883 includes the following sections relating to Entomology:—

Coleoptera, i. (1), by H. W. Bates, pp. 153–256, pls. vi.–xii.
Coleoptera, i. (2), by D. Sharp, pp. 145–312, pls. v.–vii.
Coleoptera, iii. (2), by H. S. Gorham, pp. 169–224, pl. x.
Coleoptera, vi. (1), by M. Jacoby, pp. 225–264, pls. xii.–xv.
Hymenoptera, by P. Cameron, pp. 1–80, pls. i.–iv.
Lepidoptera Rhopalocera, i., by F. D. Godman & O. Salvin, pp. 225–288, pls. xxiv. & xxiv., & ii., pls. xxv.–xxvii.
Lepidoptera Heterocera, by H. Druce, pp. 25–32, pls. iii.–v.
Rhynchota Heteroptera, by W. L. Distant, pp. 215–264, pls. xx.–xxiii.
Rhynchota Homoptera, by W. L. Distant, pp. 17–27, pl. iii.

Gogorza, J. Una excursion zoológica por Valencia. An. Soc. Esp. xii. pp. 59–81.

Includes occasional notices of Insects.

Gosch, C. C. A. On Latreille's Theory of "Le segment mediare." Nat. Tids. (3) xiii. pp. 475–531.

The writer discusses Latreille's view that the first abdominal segment

in *Hymenoptera* with petiolated abdomen is joined to the thorax, and may be recognized by the presence of a pair of spiracles, which have no counterpart in the thorax (as usually understood) in other Insects; also the views of Audouin, Burmeister, St. Fargeau, Newman, Haliday, Westwood, Newport, Schiödte, Spinola, Erichson, Reinhard, Schaum, Meinert, Packard, Gerstäcker, Lindemann, Hammond, Weismann, Palmén, and Macquart. In the main, Latreille's observations are confirmed by these writers, though several of them were either unacquainted with or have misunderstood them. The views of Latreille and others on the structure of *Diptera* are also commented on.

GREEN, S. On an Easy Method of Preparing Insects for the Microscope. J. Quek. Club (2) i. pp. 224–226. (*Cf.* also Michael and others, *tom. cit.* pp. 242, 253, & 254.)

HAGEN, H. A. On the Colour and the Pattern of Insects. P. Am. Ac. (2) ix. pp. 234–262.

The writer's conclusions are as follows:—(1) Some colours of Insects can be changed or obliterated by acids. (2) Two natural colours, madder-lake and indigo, can be produced artificially by the action of acid on fat bodies. (3) As protein bodies in Insects are changed into fat bodies, and may be changed by acids contained in Insects into fat acids, the formation of colours in the same manner seems probable. (4) Colours can be changed by different temperature. (5) The pattern is originated probably by a combination of oxygen with the integuments. (6) Mimicry of the hypodermal colours may be effected by a kind of photographic process. Finally, Hagen says, "I am convinced that colour and pattern are produced by physiological processes in the interior of the bodies of Insects." (F. MÜLLER points out the insufficiency of Hagen's view of the mechanical and chemical origin of the colour and pattern of Insects; Kosmos, xii. pp. 466–469.)

Handleiding voor het verzamelen, bewaren en verzenden van uitlandsche Insecten. Tijdschr. Ent. xxvi. pp. xci.–cxxx. (also separate, pp. 42).

Detailed instructions for the collection and preservation of Insects of all orders in foreign countries.

[HASTINGS.] Natural History of Hastings and St. Leonards, and the Vicinity. First Supplement. Hastings: 1883, 8vo, pp. 53.

Great part of this work is occupied with lists of *Coleoptera*, *Hymenoptera*, *Diptera*, *Hemiptera*, *Neuroptera*, and *Trichoptera*, and additions and corrections to the previously published list of *Lepidoptera*.

KELLER, C. Farben und Farbensinn in der Thierwelt. MT. Thurgau. Ges. v. [1882] pp. 72–100.

Includes observations on mimicry and the colour-sense in Insects, as well as in other animals.

KINGSLEY, J. S. Is the Group *Arthropoda* a Valid One? Am. Nat. xvii. pp. 1034–1037.

The writer considers that the *Crustacea* and *Tracheata* ought to be treated as independent groups.

KLEMENSIEWICZ, S. Zur näheren Kenntniss der Hautdrüsen bei den Raupen und bei *Malachius*. Verh. z.-b. Wien, xxxii. pp. 459–474, pls. xxi. & xxii.

After a short bibliography, the writer publishes detailed observations on the glands of the skin of the larvæ of *Leucoma salicis*, *Papilio machaon*, *Harpyia vinula*, and different species of *Vanessa* and *Malachius*. This paper does not admit of abridgment.

KRAEPELIN, K. Uber die Geruchorgane der Gliederthiere. Eine historisch-kritische Studie. (Oster.-Programm der Realschule des Johanneum. Hamburg: 1883, 4to, pp. 48.)

LANGENDORFF, O. Studien über die Innervation der Athembewegungen. Aus dem physiologischen Institute zu Königsberg. 6te Mittheilung. Das Athmungscentrum der Insecten. Arch. Phys. 1883, pp. 80–88.

As the respiration of Insects depends on abdominal movements, it may continue after the removal of the head. The number of respirations is increased by heat. Tobacco-smoke and chloroform lead to intermittent but more or less rhythmical respiration for a time. The head and prothorax may be removed, and the respiration will continue; and if the abdomen of a dragon-fly is cut to pieces, respiration will continue in them, thus showing that each abdominal segment possesses its own respiratory centre.

LINTNER, J. A. First Annual Report on the Injurious and other Insects of the State of New York. Albany: 1882, 8vo, pp. xxii. & 381, woodcuts.

The bulk of this volume is taken up with general matter. It discusses the importance of entomological study; the progress made in Economic Entomology; the discovery of valuable insecticides; remedies and preventives for insect depredations; a new principle of protection from insect attack; injurious Lepidopterous, Dipterous, Coleopterous, and Hemipterous Insects; the entomological reports of Asa Fitch; insect depredations upon the apple-tree; descriptions and notes of *Lepidoptera* (reprinted); addenda, and general index and index to food-plants.

LOWNE, B. T. On the Structure and Functions of the Eyes of *Arthropoda*. [Abstract.] P. R. Soc. xxxv. pp. 140–145.

LUKS, C. Ueber die Brustmuskulatur der Insecten. Jen. Z. Nat. xvi. pp. 529–552, pls. xxii. & xxiii.

Observations on the comparative anatomy of the thoracic muscles in Insects of all orders.

MACLOSKIE, G. Pneumatic Functions of Insects. Psyche, iii. pp. 375–378.

Relates to the power possessed by various larvæ of *Neuroptera*, *Coleoptera*, and *Diptera*, of dilating various parts of their bodies by inflating them with air or fluid.

MARSEUL, S. A. DE. Les Entomologistes et leurs écrits (suite). L'Ab. xx. pp. 37–96.

Bibliographical lists of the writings of Mulsant, Solier, Chapuis, Erichson, Wollaston, Haag-Rutenberg, Schaum, Capiomont, Dejean, Kiesenwetter, Gebler, Eschscholtz, Gyllenhal, and Guérin Méneville.

MAURICE, C. Les Insectes fossiles, spécialement d'après les travaux de S. Scudder. Ann. Soc. Géol. Nord, ix. pp. 152–180.

MÉGNIN, C. De l'application de l'Entomologie à la Médecine légale. C.R. xcvi. pp. 1433-1435; C.R. ent. Belg. xxvii. pp. lxxxiii.–lxxxvi.; Le Nat. v. pp. 212, 213, 339, & 340. Swedish translation: Sandahl, Ent. Tidskr. iv. pp. 39–44 & 57.

Examination was made of Insects infesting mummified corpses, in order to fix the approximate period of death.

MÜLLER, H. The Fertilization of Flowers. Translated and edited by D'Arcy W. Thompson. With a Preface by Charles Darwin. London: 1883, 8vo, pp. xii. & 669, 186 woodcuts. (Reviewed, Nature, xxviii. pp. 513 & 514.)

In this work, the subject is brought down to the present time, from the German edition of 1873. It is divided into four parts—Historical Introduction; The Insects which visit Flowers; The Mechanisms of Flowers; General Retrospect. A full bibliography and indices of Insects and plants are added. Many of the woodcuts illustrate the adaptive organs of Insects, as well as of plants.

——. Die biologische Bedeutung der Blumenfarben. Zool. Centr. iii. pp. 97–105.

Includes observations by different authors on the colours which various Insects prefer.

[NÖRDENSKIÖLD.] Insecta a viris doctissimis Nördenskiöld illum ducem sequentibus in insulis Waigatsch et Novaja Semlia anno 1873 collecta. *Hymenoptera* et *Diptera*, auctore A. E. Holmgren; *Lepidoptera*, auctore C. Aurivillius. Ent. Tidskr. iv. pp. 139-194.

A considerable number of new species are described.

NUSBAUM, J. Vorläufige Mittheilung über die Chorda der Arthropoden. Zool. Anz. vi. pp. 291–295, figs.

The author's observations relate to the eggs of *Blatta germanica*. He regards the chorda of *Arthropoda* and *Vertebrata* as both morphologically and physiologically homologous.

OSBORNE, J. A. On Growth in the Eggs of Insects. Sci. Goss. xix. pp. 225–227. (*Cf.* Am. Nat. xvii. p. 1289.)

——. Some Further Observations on the Parthenogenesis of *Zaræa fasciata*, and on the Embryology of that Species, and of *Rumia crataegata*. Ent. M. M. xx. pp. 145–148.

In *Zaræa fasciata*, the colour of the cocoon depends on the food, larvæ fed on strawberry forming dark brown resinous cocoons, and those fed on honeysuckle forming pale greenish cocoons. Larvæ and perfect insects of the same sex differ considerably in size. The position of the embryo in the egg is irregular both in *Z. fasciata* and *Gastrophysa raphani*. In *Rumia crataegata*, the eye-spots invariably occupy the same position in the

embryo, relatively to the sharp end of the polar oval, and consequently the aspect and orientation of the dorsal and ventral surfaces is constantly the same. In *Zaræa fasciata*, parthenogenesis is the rule, males being very rare. The larvæ eject a clear liquid upon pressure, and are liable to the attacks of two ichneumons and a Dipteron.

Owen [Sir] R. On Cerebral Homologies in Vertebrates and Invertebrates. J. L. S. xvii. pp. 1–13. (*Cf.* Arch. Z. expér. 2, i. pp. xxxiii.–xxxvii.)

The writer maintains "that the homologues of the primary divisions of the brain in Mollusks are the parts known in Articulates as the 'supra-' and 'sub-œsophageal ganglions,' with their commissural or annectant cords or 'crura'; that the topical relations of these parts to the gullet are the same in both great divisions of Invertebrates, and that the homologies of the aforesaid parts with the primary divisions of the Vertebrate brain are affected solely by the altered relations thereto of the gullet and mouth."

Packard, A. S. On the Genealogy of Insects. Am. Nat. xv. pp. 932–945, illustrations.

Anticipatory of 3rd Rep. U. S. Ent. Comm. The genealogical order is numerically as follows:—*Thysanura*, *Dermatoptera*, *Orthoptera*, *Pseudo-neuroptera*, *Neuroptera*, *Hemiptera*, *Coleoptera*, *Diptera*, *Lepidoptera*, *Hymenoptera*; but the complex relations between them can only be represented by the table given.

——. The Number of Segments in the Head of Winged Insects. *L. c.* pp. 1134–1138, woodcut.

Anticipatory, as above. The epicranium (bearing eyes, ocelli, antennæ, clypeus, and labrum) is formed from the original procephalic lobes; it represents the first or antennal segment, and is pleural; the remaining primitive segments are obsolete, except in Insects retaining traces of an occiput. All the gular region probably represents the base of primitive 2nd maxillæ.

——. The Embryological Development of the Locust. Rep. U. S. Ent. Comm. iii. chap. x. pp. 263–285, pls. xvi.–xxi.

A sketch of what is known of the developmental history of winged Insects in general is prefixed, relating to the formation of the blastoderm; the blastodermic disc or primitive band; origin of the cellular or germinal layers, embryonal membranes; division of the embryo, or primitive band, into body-segments; development of the appendages, nervous system, alimentary canal, the tracheæ, and salivary glands, and the development of wings. The writer thinks that wings originated in some land-insect related to existing cockroaches and *Termes*, and that the development of the wings and of the generative organs proceeded correlatively, and thus became organs of adult life. The development of *Caloptenus spretus*, Thomas, is then described, and compared with that of *Scolytidæ*, *Hylurgops pinifex*, Fitch, and *Xyleborus celatus*, Eich.

[Packard, A. S.] The Systematic Position of the *Orthoptera* in Relation to other Orders of Insects. Rep. U. S. Ent. Comm. iii. chap. xi. pp. 286–345, pls. xxiii.–lxiv. (*Cf.* Am. Nat. xvii. pp. 820–829.)

The author incidentally discusses the classification and genealogy of Insects. He proposes the following arrangement of the Orders:—

SUPERORDERS.	ORDERS.	SUBORDERS.
Euglossata (n.)	*Hymenoptera.*	
	Lepidoptera	
	Diptera	*Diptera (genuina)*
		Aphaniptera
		Pupipara
Elytrophora (n.)	*Coleoptera*	*Coleoptera (genuina)*
		Strepsiptera
Eurhynchota (n.)	*Hemiptera*	*Homoptera*
		Heteroptera
		Physapoda [Physo-]
		Mallophaga
Phyloptera (n.)	*Neuroptera*	*Trichoptera*
		Planipennia
	Pseudoneuroptera	*Odonata*
		Ephemerina
	Orthoptera	*Platyptera* (n.)
	Dermatoptera	
Synaptera (n.)	*Thysanura*	*Cinura*
		Symphyla
		Collembola

Palmén, J. A. Zur vergleichenden Anatomie der Ausführungsgänge der Sexual-organe bei den Insekten. Vorlaufige Mittheilung. Morph. JB. ix. pp. 169–176.

The author's researches were chiefly directed to the *Ephemeridæ* (q. v.), which differ from other Insects in the external openings of the sexual organs being double, both in the larvæ in all stages, and in both sexes of the imago. As a similar formation is frequently met with among *Myriopoda*, *Arachnida*, *Crustacea*, and *Vermes*, it shows that the *Ephemeridæ* stand very low in the scale of Insects. The structure met with in other families of *Orthoptera* and *Neuroptera*, as well as in *Corethra* and *Chironomus*, is briefly noticed, and compared with that of *Ephemeridæ*.

Porter, C. J. A. Experiments with the Antennæ of Insects. Am. Nat. xvii. pp. 1238–1245.

The results arrived at are that the antennæ are not the organ of any known sense.

Riley, C. V. Reports of Experiments, chiefly with kerosene, upon the Insects injuriously affecting the orange tree and the cotton plant, made under the direction of the Entomologist. Bull. U. S. Agric. Ent. i. pp. 62 (editions i. & ii.).

Saunders, W. Insects injurious to Fruits. Philadelphia : 1883, 8vo, pp. 436, 440 woodcuts. (Reviewed, Ent. xvi. pp. 190–192; Canad. Ent. xv. pp. 117–120; Gard. Chron. (2) x. p. 102.)

A work on a similar plan to Ormerod's "Manual of Injurious Insects," and treating separately of Insects injurious to the apple, pear, plum, peach, apricot and nectarine, cherry, quince, grape, raspberry, blackberry, strawberry, red, white, and black currant, gooseberry, melon, cranberry, orange, olive, and fig. Many of the figures are original, and others are copied from various sources, many from works so rare as to be practically inaccessible, such as those of Townend Glover. Several undetermined species are noticed, but none described as new. Figures of parasites are frequently added.

——. On the Introduction and Dissemination of Noxious Insects. Tr. R. S. Canada, i. (4) pp. 77–79.

Schiödte, J. C. Spiracula cribraria — Os clausum : lidt om naturvidenskabelig methode og kritik. Nat. Tids. (3) xiii. pp. 427–473.

An abstract of the observations of various authors on the spiracles of insect-larvæ.

Schnabl, J. Przyczynek do Terminologii, &c. Odbitka-z-Pamietn. Fizyjogr. ii. pp. 5–21. (*Cf.* Wien. ent. Z. ii. pp. 45 & 46.)

Appears from the notice quoted to include an entomological terminology in Polish, Latin, German, and French, in addition to a discussion on the colours of Insects.

Schneider, A. Ueber die Entwickelung der Geschlechtsorgane der Insecten. Zool. Beitr. i. pp. 62 & 63 (preliminary abstract). (*Cf.* Arch. Z. exper. (2) i. p. xlvii.)

The sexual organs of Insects arise from fibres of the muscular system of the heart.

Scudder, S. H. The Carboniferous Hexapod Insects of Great Britain. Mem. Bost. Soc. iii. pp. 213–224, pl. xvii.

3 species of fossil *Neuroptera* described and figured, and a list of the known *Neuroptera*, *Orthoptera* and *Coleoptera* (only 7 species in all) appended. The writer calls attention to "the apparent fact that while all the Carboniferous *Neuroptera* of Great Britain belong to a single group, not only in this group not represented (at least at all conspicuously) in any other locality, whether in Europe or America, but also the prevailing forms of other coal measures, the *Dictyoneuræ*, Termites, &c., are entirely absent from England."

——. The Tertiary Lake-basin at Florissant, Colorado, between South and Hayden Parks. Ann. Rep. U. S. Geol. Surv. xii. pp. 271–293, map.

Includes Geology, Palæontology, and Botany. A preliminary sketch of the remains of various Orders of Insects is given, and an approximate tabulation of the proportion of the various Orders, as represented at Florissant and at Œningen.

[Scudder, S. H.] Older Fossil Insects West of the Missouri. P. Bost. Soc. xxii. pp. 58–60.

Relates to an Hemipteron, and to three cockroaches from Permian or Upper Carboniferous measures. Two of the cockroaches are specially interesting, as approaching mesozoic forms, one being of a decidedly modern type.

Simmonds, P. L. Insects as Food. J. of Applied Sci. xxii. [1881] pp. 82–84, 98–100, 113 & 114. (*Cf.* Psyche, iv. p. 18.)

Swinton, A. H. Data obtained from solar physics and earthquake commotions applied to elucidate Locust multiplication and migration. Rep. U. S. Ent. Comm. iii. chap. v. pp. 65–85.

Taschenberg, O. Die Verwandlungen der Thiere. Prag: 1882. 8vo, pp. 268, 88 figs (*Cf.* Wien. ent. Z. ii. p. 70.)

Thomas, C. The Relation of Meteorological Conditions to Insect Development. Rep. Ins. Illin. x. pp 47–59.

Discusses rainfall, temperature, &c.

Treat, M. Injurious Insects of the Farm and Garden. New York: 1882.

United States Entomological Commission, Third Report of the, relating to the Rocky Mountain Locust, the Western Cricket, the Army Worm, Canker Worms, and the Hessian Fly, together with descriptions of Injurious Forest Insects, studies of the Embryological Development of the Locust and of other Insects, and on the Systematic Position of the *Orthoptera* in relation to other Orders of Insects; with maps and illustrations. Washington: 1883, 8vo, pp. xiv. & 347, 3 maps, & 64 pls.

This volume is the joint composition of Bruner, Swinton, Riley, & Packard. Its contents are noticed under separate headings, according to subjects and authors.

Vignal, W. Recherches histologiques sur les centres nerveux de quelques invertébrés. Arch. Z. expér. (2) i. pp. 266–412, pl. xv.–xviii.

Relates chiefly to *Mollusca*, *Crustacea*, and *Vermes*, Insects being only mentioned casually.

Weissmann, A. Beiträge zur Anatomie und Physiologie als Festgabe Jacob Henle. Bonn: 1882. (*Cf.* Rev. Sci. Nat. ii. [1882] pp. 135–139; J. R. Micr. Soc. 2, iii. pp. 360 & 361.)

Describes the development of the ovum in *Rhodites*, *Biorrhiza*, *Chironomus*, *Gryllotalpa*, and the *Podurida*.

Weyenbergh, H. Los habitantes (Vertebrados y Invertebrados) del Rio Primero. Montevideo: 1882, pp. 27, pl.

Wilms, F., & Westhoff, F. Verzeichniss der bislang in der Provinz Westfalen beobachteten Gallgebilde. JB. westf. Ver. xi. pp. 33–51.

Consists of a list of plants, and of the galls which infest them.

Physiology, Habits, Entomological Botany, &c.

Relations of the various groups of the *Arthropoda* discussed; Kosmos, xiii. pp. 688–691.

Local variation in size of Insects; Kirby, Evolution and Natural Theology, pp. 108 & 109.

Tracks of Insects and insect-larvæ discussed; Nathorst, Sv. Handl. xviii. (7) pp. 16–18 & 75–77.

Insects attracted by music; Brown, Gard. Chron. (2) xx. pp. 44 & 45.

Abstract of Forel's paper on the sensitive faculties of Insects (MT. Münch. ent. Ver. ii. pp. 1–22; *cf.* Zool. Rec. xv. *Ins.* p. 5); Kosmos, xiii. pp. 139–143.

On the supposed olfactory organs in the head of Insects; Flügel, Zool. Anz. vi. pp. 539 & 540.

A popular article on luminous Insects; Bowles, Rep. E. Soc. Ont. 1882, pp. 34–37, fig. 16.

Spectroscopic observations on the colouring matter of Insects; Mac Munn, P. Birmingh. Soc. iii. pp. 385–387.

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Mimicry in Insects, &c., discussed: Grant Allen, Encycl. Brit. ed. 9, xvi. pp. 341–345; Duncan Stewart, Nature, xxvii. p. 314; Knauer, Humboldt, i. pp. 13–20, woodcuts.

Abstract of a work on galls by G. E. C. Beauvisage; Van Segvelt, C.R. ent. Belg. xxvii. pp. cxlix.–clv.

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On the connection between Botany and Entomology; Tholin, Rev. d'Ent. ii. pp. 333 & 334.

Relations of Insects and Flowers: Nature, xxvii. pp. 223 & 498, xxviii. pp. 81, 388, & 389, xxix. pp. 104, 171, & 172; Behrens, Method. Lehrbuch d. allgem. Botanik (Braunschweig: 1882, 8vo, 2te Aufl.), pp. 164–214, woodcuts.

Plants of the genus *Dipsacus* are defended against injurious Insects by the arrangement of their leaves; Cosson, Feuill. Nat. iv. p. 21.

Fertilization of flowers; Sci. Goss. xix. pp. 161, 162, & 234.

On the fertilization of red clover by Insects; N. Z. J. Sci. i. pp. 474 & 475, 500–504, & 515.

Melon-blossoms not noticed to be visited by Insects; they are probably fertilized by moths: F. Müller, Kosmos, xiii. p. 64.

Veronica. Fertilization by Insects; Ransom, Nature, xxvii. p. 223.

Notes on insectivorous plants: Gard. Chron. (2) xx. pp. 787, 821, & 818; Bellevoye, Bull. Soc. Metz (2) xv. [1880] pp. 169 & 170 [1–293], Nat. Sicil. iii. pp. 27–30.

Drosera peltata as an insectivorous plant; Gunning, Gard. Chron. xix. p. 436, woodcut.

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List of Insects of various Orders from Socotra, and descriptions of a few new species; Taschenberg, Z. Naturw. lvi. pp. 175–185.

Notice of a small collection of Insects from Ta-chien-lu, Tibet; C. Oberthür, Bull. Soc. Ent. Fr. (6) iii. pp. xliii. & xliv.

Popular notes on butterflies and beetles at Simla; Sci. Goss. xix. p. 38.

Notes on the Entomology of Travancore; "Episodes in the life of an Indian chaplain," pp. 318–323, woodcuts. Casual notices on Indian Entomology are scattered through the same work.

Notices of Insects observed in Central Sumatra; Hagen, Geogr. MT. xxix. pp. 144 & 170.

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Remarks on the Entomology of New Zealand; P. E. Soc. 1883, p. xxix.

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Scarcity of Insects, especially butterflies, in Canada in 1882; Moffat, Canad. Ent. xv. pp. 99 & 100.

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Insect-life in the mountains of North Wales; Pearce, Sci. Goss. xix. p. 159.

Captures of Insects of various Orders in the Isle of Harris, &c.; C. W. Dale, Ent. M. M. xix. pp. 237 & 238.

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A considerable number of additions to the Finnish Museum of the University of Helsingfors in *Hymenoptera*, *Coleoptera*, *Lepidoptera*, *Diptera*, and *Hemiptera*, are recorded in Medd. Soc. Fenn. ix. pp. 175–178.

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Captures of Insects of various Orders near Wageningen; Tijdschr. Ent. xxvi. pp. xxviii.–xxxii.

Captures of Insects of various Orders at Rouge-Cloitre (Belgium); Bormans, C.R. ent. Belg. xxvii. pp. xviii.–xxxix.

Notes on *Phylloxera* and other Insects destructive to the vine, observed in the Valley of the Ahr; De Borre, *tom. cit.* pp. cxxxiii. & cxxxiv.

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Abstract of Costa's "Relazione di un viaggio nelle Calabrie" [*cf.* Zool. Rec. xix. *Ins.* p. 3] ; Von Heyden, Deutsche E. Z. xxvii. pp. 363–366.

Captures of Insects and *Arachnida* in Catalonia; Cuni y Martorell, An. Soc. Esp. xii. pp. 83–101.

Economic Entomology.

On useful and injurious Insects ; Bull. Soc. Murith. x. pp. 87 & 88.

List of Insects observed in stored rice; Am. Nat. xvii. p. 790.

Swallows probably more destructive to useful than to injurious Insects ; Thomas, Rep. Ins. Illin. xi. p. 15.

Destruction of hops by an undetermined boring larva ; Saunders, Rep. E. Soc. Ont. 1882, pp. 19–21.

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Burmese remedy for cotton Insects; Lucas, Bull. U. S. Agric. Ent. ii. p. 32.

Relations of Insect larvæ and Birds in New Zealand ; N. Z. J. Sci. i. pp. 425–427.

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Parts xvi.–xix. of Waterhouse's "Aid to the Identification of Insects" have appeared within the year, including vol. ii. pls. cxxv.–cxl.

An 8th edition of Packard's "Guide to the Study of Insects" (New York: 1883, 8vo, pp. xii. & 715) has appeared.

W. F. Kirby has published "The Young Collector's Handbook to the Orders of Insects," "of Beetles" and "of Butterflies"; London, 1883, 12mo, each 32 pp., woodcuts.

Additions and corrections to Hagen's Bibliotheca Entomologica; Hagen, S. E. Z. xliv. pp. 136–139.

Weise gives a list of the contents (chiefly Coleopterous) of Richter's "Supplementa Faunæ Insectorum Europæ"; Deutsche E. Z. xxvii. pp. 333 & 434.

Bibliography of the *Articulata* of Cincinnati; Langdon & Dury, Journ. Cincinn. Soc. vi. pp. 25–38.

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Obituary notice of F. W. Mäklin, with list of his works; Sandahl, Ent. Tidskr. iv. pp. 6–8, 51, & 52.

Obituary notice of J. L. Leconte, with portrait and complete bibliography of his publications; Bull. Brooklyn Soc. vi. pp. i.–ix.

On capitalizing specific names; Riley & others, Papilio, iii. pp. 62 & 103–105.

On the employment of Geoffroy's and Müller's generic names; Ganglbauer & Weise, Wien. ent. Z. ii. pp. 39, 91, 92, 150, & 151; Harold, S. E. Z. xliv. pp. 170–172 & 501.

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New killing-bottle; Northcote, Ent. xvi. p. 240.

On preserving Insects, especially *Lepidoptera*; Sci. Goss. xix. pp. 21 & 22.

Objections to use of napthaline cones; Am. Nat. xvii. pp. 83 & 84.

New microscopical instruments for examining Insects; P. E. Soc. 1883, pp. iv. & v.

Apparatus for showing microscopic objects; E. Saunders, P. E. Soc. 1883, p. xxxvi.

Directions for mounting Insects in balsam without pressure: Micr. News, iii. pp. 105 & 106, fig.; J. R. Micr. Soc. iii. pp. 444 & 445.

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On decolorizing the pigment of the eyes of *Arthropoda*; Della Torre, R. xcvi. p. 1806.

1

COLEOPTERA.

BY

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

THE GENERAL SUBJECT.

ALLARD, E. Mélanges Entomologiques. Ann. Soc. Ent. Belg. xxvii. (1) pp. 5–53.

Includes descriptions of several new or imperfectly-known species of *Bruchus*, and notes on various *Heteromera*.

DIMMOCK, G. The Scales of *Coleoptera*. Psyche, iv. pp. 3–11, 23–27, 43–47, & 63–71, woodcuts.

The scales of the following species are described:—*Cicindela dorsalis*; *Anthrenus scrophulariæ*, *varius*, *Hoplia cœrulea*, *modesta*, *Polyphylla variolosa*, *Valgus squamiger*, *Psiloptera drummondi*, *Chalcolepidius rubripennis*, *Alaus oculatus*, an undetermined Elaterid, *Ptinus* (?) *rutilus*, *Clytus robiniæ*, *Entimus imperialis*. A general summary, a colour-table, and directions for preparation and examination, are added.

FORBES, S. A. The Food Relations of the *Carabidæ* and *Coccinellidæ*. Bull. Illin. Lab. N. H. vi. pp. 33–64. (*Cf.* Am. Nat. xvii. pp. 417–419.)

This paper contains the record of a large number of carefully conducted experiments, fully proving that many species of both families feed to a great extent on vegetable matter. Observations are added on the extent to which these beetles form the food of birds.

GORHAM, H. S. Biologia Centrali-Americana. [*Cf.* GODMAN, F. DUCANE, & SALVIN, O., *Insecta*, General Subject.] *Coleoptera*, vol. iii. pt. 2, pp. 169–224, pl. x.

Extends from *Hydnocera* to *Ceracis*.

HOFMANN, E. Der Käfersammler. 20 kolorirte Tafeln, mit 502 Abbildungen und begleitenden Text. Stuttgart: 1883, pp. viii. & 135. (*Cf.* CB. Ver. Regensb. xxxvii. pp. 131 & 132.)

LEBŒUF, C. Faune Entomologique der Chêne: Coléoptères. Feuill. Nat. iii. pp. 45–47, 66, 67, 80, & 81. (*Cf.* also Van Segvelt & Bellier de la Chavignerie, *op. cit.* pp. 103, 125, & 126.)

MARSEUL, S. A. DE. 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. xx. pp. 168–196.

Completes the *Palpicornes*.

——. Catalogue des Coléoptères de l'Ancien-Monde. L'Ab. xx. pp. 73–120.

Extends from *Trechidæ* to *Tachyporidæ*.

Oberthür, R. Coleopterorum Novitates: Recueil spécialement consacré à l'étude des Coléoptères. Tome i. livr. i. Rennes : 8vo, pp. 48.

Reitter, E. Tableaux synoptiques des Paussides, Clavigérides, Psélaphides, et Scydménides. Traduction de C. E. Leprieur. L'Ab. xxi. pp. 1–72.

The part published extends to *Bythinus*.

Schenkling, C. Taschenbuch für Käfersammler. Leipzig : 1883, 8vo, pp. 216, pl.

On wood-boring *Coleoptera*; Schwarz, Am. Nat. xvi. pp. 823 & 824, and Ent. xvi. pp. 165 & 166.

Number of moults and length of larval life in *Coleoptera* as influenced by food; Riley, Am. Nat. xvii. pp. 547 & 548.

Dytiscidæ, *Hydroporidæ*, and *Hydrophilidæ* mistaking glass for water; McDonald & others, Ent. xvi. pp. 263 & 286.

Aquatic *Coleoptera* proof against curare and strychnine; Fredericq, Engl. Mechanic (*cf.* Am. Nat. xvii. pp. 903 & 904).

Australian beetle exhibiting parasitic fungoid growth; Shillitoe, P. L. Soc. 1875–80, p. vii.

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On collecting beetles in moss; Bell, Canad. Ent. xv. pp. 63-65.

Juicy oak-galls recommended as traps for *Coleoptera*; Hallama, Ent. Nachr. ix. pp. 200 & 201.

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Notes on various Sicilian and other species noticed in the last catalogue of European *Coleoptera* by Von Heyden, Reitter, & Weise; Ragusa, Nat. Sicil. ii. p. 289, & iii. p. 8.

Ellis, J. W. *Coleoptera* of the Liverpool District. Part iii. Naturalist, viii. pp. 113–118.

Includes additions to *Adephaga*, and list of *Palpicornes*.

[Ellis, J. W.], & Smedley, —. Notes on *Coleoptera* for Beginners. Young Nat. iv.

Fowler, W. W. Notes on New British *Coleoptera* since 1871 (concluded). Ent. M. M. xix. pp. 169–172, 197–201, 229–233, 247–250, 269, & 270, & xx. pp. 44–49.

Matthews, A., & Fowler, W. W. Catalogue of British *Coleoptera*. London : 1883, 8vo, pp. 47. (*Cf.* Ent. xvi. pp. 95 & 96 ; Wien. ent. Z. ii. pp. 207 & 208.

The arrangement is partially based on that of Leconte & Horn ; and the preface contains full explanations. The higher groups stand in the following order :—Allomera : *Filicornia* : Geodephaga, Hydradephaga ; *Clavicornia*, *Lamellicornia*, *Serricornia*. Tetramera : *Longicornia*, *Monilicornia* (= *Chrysomelidæ* and *Bruchidæ*). Heteromera, and Rhynchophora.

Sharp, D. Catalogue of British *Coleoptera*, 2nd edition. London : 8vo, pp. 39. (*Cf.* Wien. ent. Z. ii. p. 207.)

3251 species are enumerated, exclusive of 30 regarded as doubtful. The arrangement is as follows :—*Cicindelidæ*, *Carabidæ*, *Pelobiidæ*, *Haliplidæ*, *Dytiscidæ*, *Gyrinidæ*, *Hydrophilidæ*, *Staphylinidæ*, *Pselaphidæ*, *Scydmænidæ*, *Scaphidiidæ*, *Trichopterygidæ*, *Sphæriidæ*, *Corylophidæ*, *Clambidæ*, *Silphidæ*, *Histeridæ*, *Phalacridæ*, *Nitidulidæ*, *Trogositidæ*, *Colydiidæ*, *Cucujidæ*, *Cryptophagidæ*, *Lathridiidæ*, *Erotylidæ*, *Endomychidæ*, *Coccinellidæ*, *Mycetophagidæ*, *Dermestidæ*, *Byrrhidæ*, *Georyssidæ*, *Parnidæ*, *Heteroceridæ*, *Lucanidæ*, *Scarabæidæ*, *Buprestidæ*, *Eucnemidæ*, *Elateridæ*, *Dascillidæ*, *Telephoridæ*, *Cleridæ*, *Lymexylidæ*, *Anobiidæ*, *Cioidæ*, *Tenebrionidæ*, *Pythidæ*, *Melandryidæ*, *Lagriidæ*, *Pedilidæ*, *Anthicidæ*, *Pyrochroidæ*, *Mordellidæ*, *Rhipidophoridæ*, *Stylopidæ*, *Cantharidæ*, *Œdemeridæ*, *Curculionidæ*, *Scolytidæ*, *Anthribidæ*, *Bruchidæ*, *Cerambycidæ*, *Chrysomelidæ*.

The "Young Naturalist" Illustrated Catalogue of British Insects (*Coleoptera*, with col. pls.) is continued in Young Nat. iv.

W. W. Fowler has continued his papers on Natural Localities of British *Coleoptera*, relative to bark and wood, general beating and sweeping, moors and mountains, and parasitic beetles ; Ent. xvi. pp. 4–9, 55–59, & 77–81.

Captures of *Coleoptera* in the Forest of Dean, Hodgson, Ent. M. M. xix. pp. 186 & 187 ; at Hastings (chiefly myrmecophilous species), Collett, *op. cit.* xix. p. 261, xx. pp. 40 & 41 ; near Birmingham and in the New Forest, Blatch, *op. cit.* xx. pp. 19, 85, & 86 ; at Dulwich, Wood, *tom. cit.* p. 72 ; at Pitlochry, Perthshire, Beaumont, *tom. cit.* pp. 142 & 143 ; at Marlborough, Rep. Marlb. Coll. xxxi. pp. 90–94.

Additions and corrections to list of *Coleoptera* of Dulwich ; Wood & Pim, Rep. Dulwich Coll. Soc. v. pp. 44–46.

France and Belgium.

De Borre, P. Matériaux pour la faune entomologique de la province de Liége ; Coléoptères, 3me centurie. Mém. Liége (2) x. (8) pp. 55.

Extends from *Bembidium* to *Rhantus*.

Notes on Belgian *Coleoptera*, several species being recorded as new to the country; C.R. ent. Belg. xxvii. pp. xiii., xlviii., lxxxvii., xciv., xcv., ciii., cv., cxxv., cxxvi., cxxix, cxxxii., cxxxviii., cxxxix., cxlvi., & clxii.

Catalogue of the *Coleoptera* of Cayeux-sur-Mer; Decaux, Mém. Soc. N. Fr. 1883, pp. 201–232.

List of *Coleoptera* collected at Hyères in winter; Bellier de la Chavignerie, Rev. Ent. ii. pp. 69–72 & 118–120.

Germany.

Wahnschaffe, M. Verzeichniss der im Gebiete des Aller-Vereins zwischen Helmstadt und Magdeburg aufgefundenen Käfer. Neuhaldersleben: 1883.

2871 species enumerated. (*Cf.* B. E. Z. xxvii. pp. xlvii. & xlviii.)

Notes on new or rare German beetles; Deutsche E. Z. xxvii. p. 16.

Catalogue of *Coleoptera* in the collection of the Fulda Society (those from the locality indicated); Ber. Ver. Fulda, vii. pp. 36–64.

Third supplement to the *Coleoptera* of Nassau and Frankfort, raising the number to 3313 species; the observations chiefly refer to varieties: Von Heyden, JB. Nass. Ver. xxxvi. pp. 104–123.

Supplementary list of *Coleoptera* of the neighbourhood of Cassel; Bartels, Ber. Ver. Cassel, 29 & 30, pp. 101–103.

Kittel has continued his catalogue of Bavarian *Coleoptera* from *Crypturus* to *Crypiocephalus*; CB. Ver. Regensb. xxxvii. pp. 23–30, 35–57, 116–127, 132–157, & 188–190.

37 *Coleoptera* added to the Silesian Fauna in 1882, raising the known number to 4314 species; Letzner, JB. schles. Ges. lx. pp. 305–308.

Catalogue of *Coleoptera* of Oldenburg; Wiepken, Abh. Ver. Brem. viii. pp. 39–103: of Rotenburg; Eisenach, Ber. Ges. Hanau, 1879–82, pp. 73–104.

Notes on various *Coleoptera* observed near Metz; Bellevoye, Bull. Soc. Metz (2) xv. [1880] pp. 164–168.

Captures of *Coleoptera* on Lüneburg Heath; Brauns, Ent. Nachr. ix. pp. 217–225.

Branscik has published a supplementary list of the *Coleoptera* of Temesvar in a Hungarian journal. (*Cf.* B. E. Z. xxvii. p. xlv.)

Switzerland.

Preliminary list of the *Coleoptera* of the Valais; Schacht, Bull. Soc. Murith. ix. pp. 43–54.

Catalogue of rare *Coleoptera* of the Simplon; Rosset, Bull. Soc. Murith. ix. pp. 36 & 37.

Austro-Hungary.

Schlosser-Klekovski, J. Dodatci k fauni kornjasâ trojedne kraljevine izdanoj godine 1879. Znan. i umjetn., Rad Jugoslav. Ak. lxi. pp. 122–184.

Appears to be additions to the Coleopterous fauna of Croatia since 1879. No new species are described.

Captures of *Coleoptera* in the mountains of Siebenbürgen, Bielz, JB. sieb. Karp. Ver. i. pp. 116 & 122; at Orsova (S. Hungary) in July and August, 1881 and 1882, Heller, Ent. Nachr. ix. pp. 183–190.

S. Europe and Mediterranean Region.

Fairmaire, L. Coléoptères du nord de l'Afrique. R. Z. (3) vii. pp. 193–228.

Includes descriptions of several known species.

Fea, D. Le Crociere dell' yacht 'Corsaro.' Cenno sopra i Coleotteri. Ann. Mus. Genov. xviii. pp. 759–774.

Includes a list of beetles taken at Madeira, the Canaries, &c., with remarks; and the description of one new species from the Mediterranean island of Alboran.

Fiori, A. Saggio di un Catalogo dei Coleotteri del Modenese e del Reggiano: *Carabidæ* (supplement), *Dytiscidæ*, *Gyrinidæ*, *Hydrophilidæ*, *Staphylinidæ*, *Pselaphidæ*, *Scydmænidæ*. Atti Soc. Mod. xvii. pp. 19–50 & 124–164.

An important local catalogue, raising the number of species of the 7 families now known from these localities to 605.

Oliviera, M. P. d'. Catalogue des Insectes du Portugal. Rev. Soc. Porto, iii. pp. 12–20, 65–72, 129–136, 164–173, 233–241, 281–288, 336–344, 406–414, 476–483, 525–532, & 556–563.

Extends from *Homalota* to *Pentodon*.

Pirazzoli, O. Coleotteri italiani. Nozioni elementari. Imola: 1882, 16mo, pp. 212.

Ragusa, E. Catalogo ragionato dei Coleotteri di Sicilia. Nat. Sicil. ii. pp. 169–174, 193–199, 241–247, 275–280, & iii. pp. 57–60.

Extends to *Aptinus*.

Captures of *Coleoptera* at Monte Cristo; Pirazzoli, Bull. Ent. Ital. xv. pp. 152–157.

Captures of *Coleoptera* in Spain; Laguna, Act. Soc. Esp. xii. pp. 19–32: at Aguilas; Weyers, C.R. ent. Belg. xxvii. p. clvii.

Catalogue of *Coleoptera* collected by W. Kobelt in North Africa and Spain; Von Heyden, Ber. senck. Ges. 1882 & 1883, pp. 217–237.

Asia and Australasia.

Broun, T. New Zealand *Coleoptera* (continued). N. Z. J. Sci. i. pp. 299–304, 367–382, 430–441, & 487–499.

Includes *Byrrhidæ* to *Coccinellidæ*. After the first paper, the others have special titles, which are often misleading; thus the last, "On the New Zealand *Cossonidæ*," includes all the later families as far as the *Coccinellidæ*.

Fairmaire, L. Essai sur les Coléoptères de l'archipel de la Nouvelle-Bretagne. Ann. Ent. Belg. xxvii. (2) pp. 1–58.

Includes descriptions of many new or imperfectly-known species. The deficiency of *Buprestidæ* and *Lamellicornia* in these islands is remarkable.

FAUVEL, A. Les Coléoptères de la Nouvelle-Calédonie et dépendances, avec descriptions, notes et synonymies nouvelles (suite). Rev. d'Ent. ii. pp. 335–360.

Includes the *Haliplides* (1), *Dytiscides* (24), *Gyrinides* (5), and *Hydrophilides* (18).

GESTRO, R. Sopra alcuni Coleotteri di Birmania raccolti dal G. B. Cornotto. Ann. Mus. Genov. xviii. pp. 297–317.

HEYDEN, L. VON, & KRAATZ, G. Käfer aus Osch (in Turkistan). Deutsche E. Z. xxvii. pp. 337–353.

List of species, and descriptions of several new ones: *Carabidæ* and *Zonabridæ* [*Mylabridæ*] by Von Heyden; the remainder by Kraatz.

OLLIFF, A. S. Remarks on a small collection of Clavicorn *Coleoptera* from Borneo, with descriptions of new species. Tr. E. Soc. 1883, pp. 173–186.

21 species recorded from Sandákan, in N.E. Borneo, the most interesting being a new species of *Plectroscelis*.

List of *Coleoptera* from the Tekke-Turcoman country, with descriptions of new species; Von Heyden & Kraatz, Deutsche E. Z. xxvii. pp. 354–360.

Notes on a few *Coleoptera* from Nias; Van Lansberge, Notes Leyd. Mus. v. pp. 17 & 18.

List of *Cassididæ*, *Erotylidæ*, *Endomychidæ*, and *Coccinellidæ* collected by Engelhard in Saleyer; Gorham, Notes Leyd. Mus. v. pp. 253–256.

North America.

LECONTE, J. L., & HORN, G. H. Classification of the *Coleoptera* of North America. Sm. Misc. Coll. xxvi. No. 507, pp. xxxviii. & 567, woodcuts.

A revised edition of the work originally issued as Nos. 136 & 265 (1861-62, 1873) of Sm. Misc. Coll. The introduction gives a sketch of the Orders of Insects, and of the external characters of *Coleoptera*, with remarks on the families. The bulk of the work consists of an elaborate sub-division of the *Coleoptera* into two primary divisions, *Coleoptera* (genuina) and *Rhynchophora*; then into "complexes," "series," families, subfamilies, tribes, groups, and genera. A synopsis of the classification is here appended, as low as families (those not represented in N. America being placed last, in brackets).

COLEOPTERA (GENUINA).

ISOMERA.

ADEPHAGA: *Cicindelidæ*, *Carabidæ*, *Amphizoidæ*, *Haliplidæ*, *Dytiscidæ*, *Gyrinidæ*, (*Pelobiidæ*).

CLAVICORNIA: *Hydrophilidæ*, *Platypsyllidæ*, *Leptinidæ*, *Silphidæ*, *Scydmænidæ*, *Pselaphidæ*, *Staphylinidæ*, *Trichopterygidæ*, *Hydroscaphidæ*, *Sphæriidæ*, *Scaphidiidæ*, *Phalacridæ*, *Corylophidæ*, *Coccinellidæ*, *Endomychidæ*, *Erotylidæ*, *Colydiidæ*, *Rhyssodidæ*, *Cucujidæ*, *Cryptophagidæ*, *Mycetophagidæ*, *Dermestidæ*, *Histeridæ*, *Nitidulidæ*, *Trogositidæ*, *Monoto-*

midæ, *Lathridiidæ*, *Derodontidæ*, *Byrrhidæ*, *Georyssidæ*, *Parnidæ*, *Heteroceridæ*, (*Paussidæ*, *Gnostidæ*, *Hypocephalidæ*, *Thorictidæ*).

SERRICORNIA: *Dascyllidæ*, *Rhipidoceridæ*, *Elateridæ*, *Throscidæ*, *Buprestidæ*, *Lampyridæ*, *Malachiidæ*, *Cleridæ*, *Ptinidæ*, *Cupesidæ*, *Lymexylidæ*, *Cioidæ*, *Sphindidæ*.

LAMELLICORNIA: *Lucanidæ*, *Scarabæidæ*.

PHYTOPHAGA: *Spondylidæ*, *Cerambycidæ*, *Chrysomelidæ*, *Bruchidæ*.

HETEROMERA.

Tenebrionidæ, *Ægialitidæ*, *Cistelidæ*, *Othniidæ*, *Lagriidæ*, *Monommatidæ*, *Melandryidæ*, *Pythidæ*, *Œdemeridæ*, *Cephaloidæ*, *Mordellidæ*, *Anthicidæ*, *Pyrochroidæ*, *Meloidæ*, *Rhipidophoridæ*, *Stylopidæ*, (*Trictenotomidæ*, *Nilionidæ*).

RHYNCHOPHORA.

Rhinomaceridæ, *Rhynchitidæ*, *Attelabidæ*, *Byrsopidæ*, *Otiorrhynchidæ*, *Curculionidæ*, *Brenthidæ*, *Calandridæ*, *Scolytidæ*, *Anthribidæ*, (*Aglycideridæ*, *Amycteridæ*, *Brachyceridæ*, *Belidæ*).

Appendix ii. contains a bibliographical index, by S. Henshaw, to publications treating specially of N. American *Coleoptera*.

For review, see A. Matthews, Ann. N. H. (5) xii. pp. 167–172.

Record of the Coleopterology of the United States in the year 1882; Bull. Brooklyn Soc. v. pp. 69–74.

Hentz's descriptions of N. American *Coleoptera* are reprinted from J. Ac. Phil. v. [1827]; Bull. Brooklyn Soc. vi. pp. 63 & 64 (commencement only).

Captures of N. American *Coleoptera* at flowers; J. B. Smith, Bull. Brooklyn Soc. v. pp. 25 & 26.

On *Coleoptera* injurious to drugs in Canada; Saunders & Schwarz, Canad. Ent. xv. pp. 81–83 & 140.

Captures of *Coleoptera* in Canada at the end of winter; Harrington, Canad. Ent. xv. pp. 79 & 80.

Lists of *Coleoptera* of Kansas; Popenoe & Snow, Tr. Kansas Ac. v. (1877) pp. 21–40, vi. (1878) pp. 62–70 & 77–80, vii. (1881) pp. 78 & 79, viii. (1883) p. 58.

Lists of *Coleoptera* collected in various parts of Colorado and New Mexico; Snow, Tr. Kansas Ac. v. (1877) pp. 15–20, vi. (1878) pp. 75–77, vii. (1881) pp. 70–77, viii. (1883) pp. 39–45.

South America.

BERG, C. Zur Pampa-Fauna. S. E. Z. xliv. pp. 392–396.

The following additional known *Coleoptera* are noticed, besides new ones:—*Mimodromius lepidus*, *Tetragonoderus chalceus*, Chaud., *Anisodactylus posticus* (Dej.), Gemm. & Har., *Trirrhammatus patagonicus* (Waterh.), Chaud., and *Eutelocera viatica*, Sol.

BRANDEN, VAN DEN. Notice sur les travaux Coléoptèrologiques publiés dans les Anales de la Universidad de Chile, et Liste des espèces nouvelles décrites dans ces travaux et non mentionnées dans le Catalogue de Munich. C.R. ent. Belg. xxvii. pp. cxiv.–cxxiv.

CICINDELIDÆ.

[*Cf.* also CARABIDÆ.]

DOKHTOUROFF, W. Species des Cicindélides. 1re livr.: Mantichorides et Megacéphalides. St. Petersburg: 1883.

A new work, to extend to 8 or 9 livraisons, each of 100–150 pp., with 9 or 10 col. pls. (*Cf.* Rev. mens. Ent. i. p. 28.)

——. Essai sur la subdivision du genre *Cicindela*. Rev. mens. Ent. i. pp. 66–70.

Contains the commencement of a table of subgenera, some (indicated below with an asterisk) apparently new, but, with one exception, without present indication of types. The subgenera are as follows:—*Calochroa*, Hope, *Prodotes*, Thoms., *Laphyra*, Dup., **Antennaria* (p. 68, type, *C. platycera*, Gestro), *Euryoda*, Lac., *Thopeutica*, Chaud., **Habroscelis* (p. 69), **Habroscelimorpha* (p. 69), *Cicindela* (restr.), **Cephalota* (p. 70), **Ellipsoptera* (p. 70), and *Cylin*[*dro*]*dera*, Westw. [Newm.].

Bates, Biol. Centr. Am. *Col.* i. (1) p. 256, notices *Tetracha carolina*, Linn., var. *cyanides*, *Cicindela obsoleta*, Say, and *euthales*, Bates.

Mantichora sicheli, Thoms. (= *maxillosa*, Boh.). Habits noticed; Lucas, Bull. Soc. Ent. Fr. (6) iii. pp. lxxi. & lxxii.

Amblychila cylindriformis, Say, redescribed and habits noticed; Brous & Snow, Tr. Kansas Ac. v. (1877) pp. 11 & 12, fig., vi. (1878) pp. 29–32. *A. piccolominii*, Reiche, = *cylindriformis*; Horn, Tr. Am. Ent. Soc. x. p. 269.

Omus. Translation of Schaupp's synopsis; Dokhtouroff, Rev. mens. Ent. i. pp. 61–66.

Megacephala senegalensis, Latr., var. *cyanescens* from Senegal described; *id. l. c.* p. 4, and Spec. Cicind. i. p. 29, pl. iii. fig. 5.

Tetracha bifasciata, Brullé, var. *obscura* (Staud., MS.?) from Amazons noticed; *id.* Rev. mens. Ent. i. p. 6, and Spec. Cicind. i. p. 68, pl. viii. fig. 6.

Cicindela. Habits of rare North American species; Williston, Tr. Kansas Ac. vi. (1878) pp. 32 & 33. *C. caternaulti* and *nysa*, Guér., = *strachani*, Hope, and *escheri*, Dej., respectively; Dokhtouroff, Rev. mens. Ent. i. p. 54. *C. muata*, Har., var., and *C.* (*Ophryodera*) *rufo-marginata*, Boh., noticed; Quedenfeldt, B. E. Z. xxvii. pp. 246–248, and Dohrn, S. E. Z. xliv. p. 357. *C. flexuosa*, Fabr., and *C. campestris*, Linn., var. *saphyrina*, Gené, noticed from the small island of San Pietro, near Sardinia; Pfaff, C.R. ent. Belg. xxvii. pp. xcvii. & xcviii. *C. flexuosa*, Fabr.: transformations described; Xambeu, Ann. Soc. L. Lyon, xxix. pp. 130–132. The species is also noticed by Ragusa, Nat. Sicil. ii. pp. 302 & 303. *C. hybrida*, Linn., var. *sibirica* described; Dokhtouroff, Rev. mens. Ent. i. p. 13. *C. magdalenæ*, Lec., = *senegalensis*, Dej.; Horn, *l. c.* pp. 269 & 270. *C. repanda*, Dej., pupa described and figured; Schaupp, Bull. Brooklyn Soc. v. p. 18, pl. i. figs. 4 *a*, *b*. *C. sturmi*, Ménétr., var. *staudingeri* from Osch described; Kraatz, Deutsche E. Z. xxvii. p. 337, note.

Dromica (*Cosmema*) *marginella*, Boh., noticed; Dohrn, *l. c.* p. 280.

Pogonostoma. Habits, &c., noticed; Raffray, Bull. Soc. Ent. Fr. (6) iii. pp. xxviii. & xxix.

New species :—

Tetracha splendida, Dokhtouroff, Rev. mens. Ent. i. p. 5, and Spec. Cicind. i. p. 46, pl. v. fig. 2, Peru.

Pseudoxychila chaudoiri, id. Rev. mens. Ent. i. p. 8, and Spec. Cicind. i. p. 89, pl. x. fig. 8, Ecuador.

Cicindela niohozana, p. 213, *ovipennis*, pl. xiii. fig. 1, p. 214, and *novitia*, p. 216, Bates, Tr. E. Soc. 1883, Japan; *C. flammulata*, fig. 1, p. 241, *uncivittata*, p. 242, *nubifera*, fig. 2, p. 243, *semicuprea*, p. 244, *infuscata*, *variventris*, p. 245, and *C.* (*Ophryodera*) *mechowi*, fig. 3, p. 248, Quedenfeldt, B. E. Z. xxvii. pl. iii., Malange; *C. kraatzi*, New Guinea, *borneana*, Borneo, and *bisignata*, California, Dokhtouroff, Rev. mens. Ent. i. pp. 10–12.

Tricondyla brunnea, id. *l. c.* p. 13, Sumatra.

Peridexia hilaris, Fairmaire, Le Nat. v. p. 364, Madagascar.

Distypsidera plustchevskii and var. *interrupta*, Dokhtouroff, *l. c.* p. [illegible]ub-Somerset, N. Australia.

Dromica albo-clavata, Natal, p. 8, *granulata*, Caffraria (?), and *transwaalensis*, Transvaal, p. 9, *id.* l. c.; *D.* (*Cosmema*) *auro-punctata*, Quedenfeldt, *l. c.* p. 249, pl. iii. fig. 4, Malange; *D.* (*Myrmecoptera*) *bilunata*, Dohrn, S. E. Z. xliv. p. 278, Zambesi.

Carabidæ.

Bates, H. W. Biologia Centrali-Americana [*cf.* Godman, F. Ducane, & Salvin, O.; *Insecta*, General Subject]. *Coleoptera*, vol. i. pt. i. pp. 153–256, pls. vi.–xii.

Extends from *Anchonoderus* to *Pseudomorpha*, and includes a page of Supplement (*Cicindela*).

——. Supplement to the Geodephagous *Coleoptera* of Japan, chiefly from the Collection of George Lewis, made during his second visit, from February, 1880, to September, 1881. Tr. E. Soc. 1883, pp. 205–290, pls. xii. (map) & xiii.

167 species added (125 new), bringing up the list to 408 species. Exclusive of species referred to new genera, the following alterations of synonymy are made in the former list:—*Notiophilus impressifrons*, Mor. (*nec* Chaud.), = *niponicus*, Lew.; *Calosoma mikado*, Bates, = *maximowiczi*, Mor.; *Chlænius hospes*, Bates, = *posticalis*, Motsch.; *subhamatus*, Bates, = *biguttatus*, Motsch.; *culminatus*, Bates, = *nigricans*, Wied.; *Harpalus lævicollis*, Bates (*nec* Duftschm.), = *congruus*, Motsch.; *japonicus*, Bates, = *rugicollis*, Motsch.; *zabroides*, Bates (*nec* Dej.), = *corporosus*, Motsch.; *Pœcilus planicollis*, Motsch. (?), = *encopoleus*, Solsk.; *lepidus*, Bates (*nec* Fabr.), = *fortipes*, Chaud.; *Pterostichus microcephalus*, Bates (*nec* Motsch.), = *Lagarus nimbatus*, Mor.; *japonicus*, Motsch., and *tropidurus*, Bates, = *prolongatus*, Mor.; *Bembidium cogna-*

tum, Mor. (*nec* Dej.), = *consentaneum*, Gemm.; *Crepidogaster bicolor*, Bates (*nec* Boh.), = *Styphromerus batesi*, Chaud.; *Dromius quadraticollis*, Bates (*nec* Mor.), = *prolixus*, Bates; *Paraphæa signifera*, Bates, = *Anchista binotata*, Dej.

In the Japanese *Geodephaga*, the prevailing character is North Temperate, but includes a large number of tropical genera and species. The introductory part of the paper concludes with Lewis's Itinerary (1880–81). In the body of the paper the following known species are specially noticed: — *Cicindela amurensis*, Mor., *sumatrensis*, Herbst, var. *niponensis*, *Homophron æqualis*, Mor., *Carabus granulatus*, Linn., var. *telluris*, Lew., *C. procerulus*, Chaud., *arboreus*, Lew., *albrechti*, Mor., *gehini*, Fairm., var. *grandis*, pl. xiii. fig. 3, *Harpalus vicarius*, Har., *rugicollis*, Motsch. (= *japonicus*, Mor.), *congruus*, Motsch. (= *lævicollis*, Mor., and *Tachycellus falsus*, Bates), *discrepans*, Mor., *corporosus*, Motsch., *Amara striatella*, Putz., *Trigonognatha cuprescens*, Motsch., *Pterostichus* (*Omaseus*) *prolongatus*, Mor. [= *P.* (*Steropus*) *spidurus*, Bates, ? *Omaseus japonicus*, Motsch., and var. *P.* (*Lyperus*) *igineus*, Mor.], *Lagarus nimbatus*, Mor. (? = *Argutor microcephalus*, Dtsch.), *Pœcilus encopoleus*, Solsk. (= *planicollis*, Motsch.), *fortipes*, Chaud., *Bembidium* (*Notaphus*) *batesi*, Putz. (= *B. niloticum*, Dej.), *Bembidium* (*Peryphus*) *elongatum*, Dej., *Drypta japonica*, Bates.

Ehlers, W. Ueber blinde Bembidien. Deutsche E. Z. xxvii. pp. 30–32.

The following known genera are recharacterized and restricted:— *Typhlocharis*, Dieck, *Scotodipsas*, Schaum (to include *S. saulcii* and *hirtus*, Dieck, and *glaber*, *subalpinus*, *affinis* and var. *ovalipennis*, and *alpinus*, Baudi), and *Microtyphlus*, Linder (to include *M. pandellii*, Sauley, = *pyrenæus*, Pandellé, MS., *taurinensis*, Baudi, *schaumi*, *baudii*, and *aubæi*, Saulcy, *revelierii*, Perris, and *perpusillus*, Rott.). A few new genera and species are also described.

Gehin, J. B. Lettres pour servir à l'histoire des Insectes de la Tribu des Carabides. 6me lettre. Bull. Soc. Metz (2) xv. [1880] pp. 171–228. [*Cf.* Zool. Rec. xvii. *Ins.* p. 19.]

Noticed here to give the correct reference. A full table of contents of the six letters forming the first series is appended.

Kolbe, H. J. Ueber die geographischen Verhältnisse der nordafrikanischen Fauna der *Coleoptera* (*Carabidæ*). B. E. Z. xxvii. pp. 225–234.

Includes lists of the North African genera not extending to the Ethiopian region, of those which extend to it, of the North African genera not extending to Europe, and of species common to Europe and North America.

Quedenfeldt, G. Verzeichniss der von D. von Mechow in Angola und am Quango-Strom gesammelten Cicindeliden und Carabiden. B. E. Z. xxvii. pp. 241–268, pl. iii.

66 species enumerated, of which 28 are new, chiefly from Malange.

Von Heyden gives an abstract of Des Gozis's memoir on *Carabidæ* [*cf.* Zool. Rec. xix. *Ins.* pp. 21 & 22]; Deutsche E. Z. xxvii. pp. 59–73.

Abstract of Horn's classification of the *Carabidæ*; Everts, Tijdschr. Ent. xxvi. pp. xx.–xxii.

List of *Carabidæ* found in the neighbourhood of New York City; Schaupp, Bull. Brooklyn Soc. vi. pp. 29–32, 71, & 72.

Synoptic tables of the North American *Coleoptera*, with appended bibliography, are continued in Bull. Brooklyn Soc. v. & vi., and include the following genera:—*Badister*, *Selenophorus*, *Pterostichus* and allies, *Pogonus*, *Patrobus*, *Anophthalmus*, *Trechus*, *Myas*, *Olisthopus*, *Perigona*, *Lachnophorus*, *Euphorticus*, *Atranus*, *Pentagonica*, *Coptodera*, *Phlœoxena*, *Stenolophus*, *Acupalpus*, *Pseudomorpha*, *Calathus*, *Bradycellus*, *Tachycellus*, *Discoderus*, *Agonoderus*, *Amblychila*, *Omus*, *Tetracha*, *Cicindela*. (The synopsis of *Cicindelidæ* is only commenced in 1883, and is intended to be fully illustrated with coloured figures, of which pl. i., with 24 figures, appeared during that year in vol. vi.)

Geodephaga destructive to *Leucania unipuncta* noticed, and *Calosoma calidum*, Fabr., *Pasimachus elongatus*, Lec., *Harpalus caliginosus*, Fabr., and *Calosoma scrutator*, Fabr., figured; Riley, Rep. U. S. Ent. Comm. iii. p. 125, pls. i. figs. 8*a*, *b*, & ii. figs. 1, 2, & 4.

Elaphrides.

Notiophilus punctulatus, Wesm., = *quadripunctatus*, Dej., and *punctulatus*, Fairm. & Lab., and Schaum, = *substriatus*, Waterh., according to Fauvel. Dietz discusses the question at some length; C.R. ent. Belg. xxvii. pp. lxxviii.–lxxxi.

Hiletides.

Hiletus sumatrensis, sp. n., Oberthür, Notes Leyd. Mus. v. p. 215, Sumatra.

Carabides.

Leistus crenatus, Fairm., noticed; Baudi, Nat. Sicil. ii. pp. 247 & 248.

Carabus cancellatus, Ill., recorded from North Carolina; Horn, Tr. Am. Ent. Soc. x. p. 270. *C. catenatus*, Pauz., var. *korlevici* from Croatia described; Hoffmann, Ent. Nachr. ix. pp. 213 & 214. *C. cavernosus*, Friv.: remarks on distribution; Pirazzoli, Bull. Ent. Ital. xv. pp. 152–157: habits and characters discussed; Dohrn, S. E. Z. xliv. pp. 127–129. *C. corrugis*, Dohrn, noticed by him; *l. c.* p. 102. *C. faminii*, Dej., and *siculus*, Ragusa, noticed by him; Nat. Sicil. ii. p. 196. *C. festivus*, Dej., with mouth covered by horny excrescence; Flentiaux, Rev. d'Ent. ii. p. 228. *C. gehini*, Fairmaire, figured; Waterhouse, Aid, ii. pl. cxxv. fig. 4. *C. stæhlini*, Adams, *roseri*, Fald., and 2 new species discussed and differentiated; Reitter, Deutsche E. Z. xxvii. pp. 55–59. *C. gemellatus*, Fald., = *imitator*, Reiche, and ? *separandus*, Kraatz; *C. gemellatus*, Ménétr., is distinct; *C. acutangulus*, Chaud., = *convexus*, Fabr., var.: *id.* Wien. ent. Z. ii. p. 96. *C. parreyssi* var. *gattereri*, Géhin: correspondence relative to this insect; Deutsche E. Z. xxvii. pp. 155–158.

Pantophyrtus turcomannorum, Thieme, discussed; Von Heyden & Kraatz, Deutsche E. Z. xxvii. pp 337, 338, 361, & 362.

Damaster capito, Lewis, figured; Waterhouse, *l. c.* pl. cxxv. fig. 5.

Calosoma auro-punctatum, Herbst, with front right leg deformed ; Flentiaux, *l. c.* p. 228. *C. calidum*, Fabr., noticed and figured ; Lintner, Rep. Ins. N. Y. i. p. 128, fig. 29 : larva described ; Schaupp, Bull. Brooklyn Soc. v. pp. 33 & 34. *C. caraboides*, Raffr., *nec* Heer, renamed *raffrayi* ; Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 89. *C. carbonatum*, Lec., = *peregrinator*, Guér. ; Horn, *l. c.* p. 270. *C. inquisitor*, Linn., var. *cæruleum* from Sicily and Croatia described ; Ragusa, *l. c.* p. 197. *C. sericeum*, Fabr., noticed ; Palumbo, Nat Sicil. ii. p. 175.

Callisthenes elegans, Kirsch, noticed ; Dohrn, *l. c.* pp. 102 & 103. *C. usgetensis*, Solsky, ♀ noticed ; Von Heyden, Deutsche E. Z. xxviii. p. 338.

Goniognathus, g. n., Von Heyden & Kraatz, Deutsche E. Z. xxvii. p. 361. Allied to *Megadontus* ; type, *G. gracilis*, sp. n., *ibid.*, Samarcand.

New species :—

Nebria sadona, *sæviens*, p. 217, *reflexa* and var. *niohozana*, *N. japonica*, p. 218, *chalceola* and *snowi*, p. 219, Bates, Tr. E. Soc. 1883, Japan ; *N. dejeodinsi*, Darjeeling, p. 47, *dekraatzi* [sic], Peking, *atlantica*, locality not stated, p. 48, R. Oberthür, Col. Nov. i.

Leistus sardous (Chaud., MS.), Baudi, Nat. Sicil. ii. p. 248, Sicily ; *L. crassus*, p. 220, *alecto* [? = *laticollis* (Mor.), Putz.], *prolongatus*, p. 221, *obtusicollis* and *subæneus*, p. 222, Bates, *l. c.*, Japan; *L. angustus*, Reitter, Rev. mens. Ent. i. p. 40, Svanetia.

Pogonophorus punctipennis, Fauvel, Faune Gallo-Rhén. *Col.* ii. p. 100, Monte Rosa.

Carabus weissii, Reitter, Wien. ent. Z. ii. p. 1, Bosnia (*cf.* also Gussner & Ganglbauer, *tom. cit.* p. 63 & note, and Schaufuss & Reitter, Rev. mens. Ent. i. pp. 4, 43, & 44) ; *C. imitator* and *swanecticus*, id. Deutsche E. Z. xxvii. pp. 56 & 57, Caucasus; *C. grossarii*, Haury, R. Z. (3) vii. p. 312, pl. ix. fig. 2, Amoor ; *C. yezoensis*, p. 223, *aquatilis*, p. 224, *exilis*, *tenuiformis*, p. 226, *gracillimus*, *fujisanus*, p. 227, and *porrecticollis*, p. 228, Bates, *l. c.*, Japan.

Cychrides.

Cychrus caraboides var. β *sabaudus* from Savoy described; Fauvel, Faune Gallo-Rhén. *Col.* ii. p. 30. *C. convexus*, Moraw., and *tuberculatus*, Harr., noticed ; Horn, Tr. Am. Ent. Soc. x. p. 270. *C. convexus* figured; Waterhouse, Aid, ii. pl. cxxv. fig. 1.

Cychrus (*Scaphinotus*) *snowi*, sp. n., Leconte, Tr. Kansas Ac. vii. (1881), p. 74, Santa Fé.

Trigonodactylides.

Trigonodactyla insignis, sp. n., Bates, Tr. E. Soc. 1883, p. 277, pl. xiii. fig. Dolupan.

Notes

Crentacanthides.

Casnonia. Bates, Biol. Centr. Am. *Col.* i. (1), specially notices or redescribes *C. subdistincta*, Chaud., var. *transparens*, Motsch., fig. 20, *margine-striata*, Putz., fig. 19, p. 161, and *tubulifera*, B., fig. 25, pl. vi.

Casnonia irregularis, *tristigma*, Guatemala, p. 161, *sulcicauda*, Gua-

temala, and *championi*, Panama, p. 162, Bates, Biol. Centr. Am. *Col.* i. (1); *C. ægrota*, id. Tr. E. Soc. 1883, p. 278, Japan; *C. subapicalis*, Oberthür, Notes Leyd. Mus. v. p. 216, Sumatra; spp. nn.

Ctenodactylides.

Leptotrachelus dorsalis (Fabr.), Chaud., = *mexicanus*, Chaud.; *punctipennis*, pl. vi. fig. 18, and *panamensis*, Bates, redescribed, p. 159: Bates, Biol. Centr. Am. *Col.* i. (1).

Pionycha sp. from Brazil. Variations in colour of elytra described and contrasted; F. & H. Müller, Kosmos, xiii. pp. 32–36, figs.

Leptotrachelus dilaticollis, sp. n., Bates, *l. c.* p. 160, Guatemala.

Galeritides.

Bates, Biol. Centr. Am. *Col.* i. (1), specially notices or redescribes *Calophæna cruciata*, B., fig. 22, *lævigata*, B., *bicincta*, Dej. (= *bifasciata*, Latr.), var. *ligata*, fig. 21, pl. vi. p. 163, and *arcuata*, Guér., var. *complanata*, *Galerita æquinoctialis*, Chaud. (var. *elegans*, Chaud.), p. 164, *nigra*, Chevr., var. from Guatemala, pl. vi. fig. 23, *beauvoisi*, Chaud., *rufipennis*, Dej. (= *insularis*, Cast., *thoracica*, Chevr., and *erythrodera*, Brullé), *mexicana*, Chevr. (= *atripes*, Lec.), p. 165, and *Ancistroglossus dimidiaticornis*, Chaud., pl. vii. fig. 1, p. 167.

Galerita janus, Fabr. Transformations described; Coquillett, Rep. Ins. Ill. xi. p. 63. Pupa described and figured; Schaupp, Bull. Brooklyn Soc. v. p. 18, pl. i. figs. 6 & 6*a*.

New species :—

Drypta fulvicola, Bates, Tr. E. Soc. 1883, p. 279, Japan; *D.* (*Desera*) *pyriformis*, Quedenfeldt, B. E. Z. xxvii. p. 250, Malange.

Calophæna vitticollis, Bates, Biol. Centr. Am. *Col.* i. (1) p. 164, Panama.

Galerita forreri, id. *l. c.* p. 165, pl. vii. fig. 2, Mexico; *G. seminigra*, Chaudoir, Col. Nov. i. p. 17, Ashanti; *G. attenuata*, Quedenfeldt, *l. c.* p. 250, Quango.

Planetes secernendus, Oberthür, Notes Leyd. Mus. v. p. 217, Sumatra.

Diaphorus högei [*hœgii*], Bates, *l. c.* p. 166, pl. vi. fig. 24, Mexico.

Helluonides.

Acanthogenius (*Macrochilus*) *lugubris*, Schaum, noticed; Dohrn, S. E. Z. xliv. pp. 280 & 281.

Simoglossus niger, Chaudoir, noticed by him; Col. Nov. i. p. 17.

Helluomorpha longicollis, sp. n., Bates, *l. c.* p. 167, pl. vii. fig. [illegible] Guatemala.

[illegible], is d[illegible] ent. Z. [illegible] tive to

Brachynides.

Pheropsophus biplagiatus and *Brachynus cinctipennis* and *sallæi* fig[illegible], Bates, Biol. Centr. Am. *Col.* i. (1) pl. vii. figs. 5, 4, & 6. *B. convexus*, Chaud., = *mexicanus*, Dej.; *bicolor*, Chaud., = *elongatulus*, Chaud., var.; and *ventralis*, Mannerh., = *geniculatus*, Dej.: *id. l. c.* pp. 169 & 170.

Pheropsophus kersteni, Gerst. Variation in shoulder-spots noticed; Dohrn, S. E. Z. xliv. p. 281.

Brachynus fanius and *siculus*, Patti, discussed and redescribed; Ragusa, Nat. Sicil. iii. pp. 13–16.

Brachynus æneicostis, Bates, Tr. E. Soc. 1883, p. 279, Japan; *B. hageni*, Oberthür, Notes Leyd. Mus. v. p. 217, Sumatra; *B. frontalis*, Chaudoir, Col. Nov. i. p. 18, Fly River, New Guinea: spp. nn.

Lebiides.

Bates, Biol. Centr. Am. *Col.* i. (1), figures or specially notices *Nemototarsus fallax*, Dej., var. (?), p. 174; *Pinacodera atrata* (= *nigrita*, Chaud., and varr. *amblygona* and *angulifera*, Bates), fig. 3, *cribrata*, Chaud., fig. 1, pl. viii., *Apenes pallidipes*, Chevr., pl. vii. fig. 24 (= *mexicanus* and *marginipennis*, Chaud.), *circumcincta*, Chaud., pl. viii. fig. 4, *obscura*, Chaud, pl. vii. fig. 25, and *comis*, Bates, pp. 181–190; *Plochionus pallens*, Fabr. (= *bonfilsi*, Dej., and *boisduvali*, Gory), *Onota angulicollis*, Reiche, fig. 19, *Otoglossa rufitarsis*, Chaud. (= *cœlestina*, Bates), *obscurella*, Bates, *Micragra ænea*, fig. 12, *Hyboptera tuberculata*, Dej., fig. 23, pl. viii. *Aspasiola rutilans*, Chaud., and var. *ignea*, *Philophuga viridicollis*, Lec. (= *purpurea*, *subcordata* and *viridis*, Chevr.), *Callida lætipennis*, Bates, *similis*, Reiche (= *similata*, Chaud., and *subærea*, Motsch.), *jansoni*, Bates, fig. 15, *micella*, Chaud., *metallescens*, Chaud. (= *planulata*, Lec.), fig. 10, and var. *atrata*, *onypterygioides*, Chaud. (= *aurata*, Motsch), fig. 18, *semirubra*, Bates, *amethystina*, Fabr. (= *splendida*, Gory, *auricollis*, Cast., *festiva*, Brullé, and *dimidiata*, Reiche), *bella*, Chaud., fig. 11, pl. ix. *cordicollis*, Putz. (= *cyanoptera*, Lec.), *basalis*, Putz. (= *semirufa*, Motsch.), *pallidipennis*, Chaud. (= *brunnea* and *flava*, Chevr., and *testacea*, Reiche), pp. 190–215; *Loxopeza chloroptera*, Chaud. (= *nigriventris*, Putz.), *Lebia quadricolor*, Chevr., fig. 7, *brachynoides*, Reiche, fig. 8, *marginicollis*, Dej. (= *limbicollis*, Motsch, and *affinis*, Dej.), *callizona*, Bates, fig. 17, *bitæniata*, Chevr. (= *bicincta*, Cast., and *femorata*, Motsch.), *charina*, Bates, fig. 18, *variegata*, Dej., *anchora*, Chevr. (= *bonellii*, Putz.), fig. 20, pl. x., *soror*, Chaud., fig. 2, *centro-maculata*, Putz., fig. 3, *chlorotica*, Dej., fig. 6, *latifascia*, Chaud., fig. 7, *nigriceps*, Chaud., fig. 8, *xanthopleura*, Chaud., fig. 9, *biannulata*, Chaud., fig. 13, *corcula*, Bates, fig. 17, *discopicta*, Chaud., fig. 20, *rugatifrons*, Chaud., fig. 24, *vicina*, Chaud., fig. 25, pl. xi., *bivittata*, Fabr. (= *quadrivittata*, Dej.), *hilaris*, Chaud., fig. 6, *Lia quadrinotata*, Chevr., fig. 7, and *quadriannulata*, Bates, fig. 9, pl. xii. pp. 220–245; *Agra oblongo-punctata*, Chevr., fig. 14, *resplendens*, Chaud., fig. 15, *fada*, Chevr., fig. 17, *læticolor*, Bates, *mexicana*, Buq., *chrysopteryx*, Bates, fig. 22, *panamensis*, Bates, *rufo-ænea*, Chevr., *dimidiata*, Chevr., fig Tr. *virgata*, Chevr., fig. 24, and *obscuripes*, Chaud., pp. 245–254, pl. xii.

Dolida analis, Chaud., and allies, tabulated; Quedenfeldt, B. E. Z. Notes pp. 251 & 252.

Craindis rufescens, Gebl., and *simplex*, Zoubk., noticed; Kraatz, Deutsche E. Z. xxvii. p. 338, note. *C. daimio*, Bates, figured; Waterhouse, Aid, ii. pl. cxxv. fig. 2.

Metabletus exclamationis, Ménétr., = *fusco-maculatus*, Motsch., = *vir-*

gatus, Reiche., = ?*patruelis*, Chaud. ; Von Heyden, Deutsche E. Z. xxvii. p. 354.

Amblystomus. Revision of European species (8) ; the known species are as follows : *A. mauritanicus*, Dej. (= *solskii*, Reiche), and var. *albipes*, Sturm. (= *ruficornis*, Schauf.), *A. metallescens*, Dej. (= *dilatatus*, Chaud., and *majoricensis*, Schauf.), *A. niger*, Heer, *A. escorialensis*, Gaut., *A. picinus*, Baudi (= *macedo*, Schauf.), and *A. raymondi*, Gaut. (= *sardous*, Baudi); Reitter, Wien. ent. Z. ii. pp. 139–143.

Ochropisus, g. n., Bates, Biol. Centr. Am. *Col.* i. (1) p. 176. Allied to *Phlœotherates* ; eyes scarcely prominent, head with no transverse depression, hind tibiæ finely grooved on the outer edge, claws finely serrated. Types, *O. caudalis*, pl. vii. fig. 10, and *bembidioides*, spp. nn., *ibid.*, Panama.

New species :—

Agra eurypelma, fig. 11, Mexico, p. 245, *insidiosa*, British Honduras, *castanicipes*, fig. 12, *macracantha*, Panama, *æneola*, fig. 13, British Honduras, Guatemala, p. 246, *soccata*, Panama, p. 247, *regularis*, fig. 16, Guatemala, *rufiventris*, p. 248, *semifulva*, fig. 18, Panama, *fulvicauda*, Nicaragua, p. 249, *multisetosa*, fig. 19, Panama, *elaina*, fig. 20, British Honduras, Panama, *oliviella*, Guatemala, p. 250, *purpurea*, fig. 21, Panama, p. 251, *ictina*, Mexico, British Honduras, Guatemala, *auro-nitens*, Guatemala, p. 252, and *championi*, Panama, p. 253, Bates, Biol. Centr. Am. *Col.* i. (1) pl. xii.

Callida cupreo-micans, Oberthür, Notes Leyd. Mus. v. p. 218, Sumatra ; *C. sericinitens*, fig. 3, British Honduras, Guatemala, p. 203, *aurescens*, fig. 4, *lampra* (= *dives*, pt., Chaud.), fig. 2, Guatemala, *pulcherrima*, fig. 7, Panama, *aureola*, fig. 6, Guatemala, p. 204, *tetrapora*, fig. 13, Panama, *ignobilis*, Mexico, Guatemala, p. 205, *cyanippe*, Mexico, p. 206, *variolosa*, fig. 14, Guatemala, *sumptuosa*, fig. 20, Mexico, *regina*, fig. 16, Guatemala, p. 207, *semifacta*, Mexico, British Honduras, Guatemala, p. 208, *tropicalis*, fig 5, Mexico, *chryseis*, fig. 17, Guatemala, p. 209, *scintillans*, *championi*, fig. 8, p. 210, *semicincta*, fig. 9, Panama, *flohri*, fig. 19, p. 211, *fimbriata*, *circumcincta*, fig. 12, pl. ix. p. 212, *hœgei* [*hœgii*] and *rustica*, Mexico, p. 213, Bates, *l. c.*

Cymindis raffrayi, Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 89, Abyssinia.

Pinacodera chalcea, Bates, *l. c.* p. 187, pl. vii. fig. 23, Guatemala.

Apenes peryphoides, id. *l. c.* p. 190, pl. viii. fig. 2, Guatemala.

Demetrias marginicollis, id. Tr. E. Soc. 1883, p. 285, Japan.

Lachnoderma asperum, id. *ibid.* pl. xiii. fig. 2, Japan.

Axinopalpus mexicanus, Mexico, and *jucundus*, Guatemala, *id.* Biol. Centr. Am. *Col.* i. (1) p. 193, pl. viii. figs. 6 & 8.

Dromius ephippiatus, Fairmaire, C.R. ent. Belg. xxvii. p. clvi., I. *D. prolixus* (= *quadraticollis*, Bates, *nec* Mor.), p. 282, *campanulatus*, *viceps*, and *crassipalpis*, Bates, Tr. E. Soc. 1883, p. 283, Japan ; *D. flo*, Mexico, and *guatemalenus*, pl. viii. fig. 5, Guatemala, *id.* Biol. Centr. Am. *Col.* i. (1) pp. 193 & 194.

Blechrus platensis (Chaud., MS.), Berg, S. E. Z. xliv. p. 393, Buenos Aires.

Apristus mexicanus, Mexico, Guatemala, and *longulus*, pl. viii. fig. 7, Panama, Bates, *l. c.* pp. 191 & 192.

Cryptobatis chontalensis, id. *l. c.* p. 202, pl. viii. fig. 20, Chontales.

Philophuga brachinoides [*brachy-*], id. *ibid.* pl. ix. fig. 1, Mexico.

Lebia discigera, Chaudoir, Col. Nov. i. p. 18, S. Africa; *L. duplex*, p. 286, *sylvarum* and *iolanthe*, p. 287, Bates, Tr. E. Soc. 1883, Japan; *L. charilla*, fig. 9, Mexico to Panama, *flammea*, p. 223, *dugesi*, Mexico, *ignita*, fig. 10, Guatemala, *cœlina*, fig. 11, Panama, *xanthogona*, Mexico, p. 224, *croceicollis*, fig. 13, Mexico, Guatemala, *goniessa*, fig. 12, *microtes*, p. 225, *fimbriolata*, fig. 14, Guatemala, *cymindoides*, Mexico, *oliviella*, Panama, p. 226, *flohri*, Mexico, *retusa*, fig. 15, Guatemala, Panama, *pœcilura*, fig. 16, Panama, p. 227, *clio*, fig. 19, p. 229, *scalpta*, fig. 21, pl. x., *duillia*, fig. 1, pl. xi., Mexico, p. 230, *rhodope*, fig. 24, *rufilia*, fig. 25, both from Mexico and Guatemala, *neanthe*, fig. 22, British Honduras, *calliope*, fig. 23, pl. x., Mexico, Guatemala, p. 231, *arietis*, fig. 4, *chelostigma*, fig. 5, Panama, p. 232, *bivitticollis*, fig. 10, Guatemala, Panama, *chiriquensis*, fig. 11, *biforis*, fig. 12, Panama, p. 234, *tolteca*, fig. 14, Mexico, *maya*, fig. 15, Guatemala, *inconstans*, fig. 16, Guatemala, p. 235, *cordelia*, fig. 18, p. 236, *sara*, fig. 19, *chalybe*, Mexico, p. 237, *sinanja*, fig. 21, Guatemala, *mirabilis*, fig. 22, Panama, *melantho*, fig. 23, pl. xi., Mexico, and var. *macra*, Ega, p. 238, *ditissima*, Ega, p. 239, note, *calliparis*, fig. 1, Guatemala, *histrionica* (with varr. *scutellata*, Chevr., and *nigro-signata*, Duges), figs. 2 & 3, Mexico, Guatemala, p. 240, *extrema*, Panama, p. 241, *heraldica*, Guatemala, *coptoderina*, fig. 4, Panama, and *mesostigma*, fig. 5, pl. xii., Mexico, p. 242, *id.* Biol. Centr. Am. *Col.* i. (1).

Lia championi, p. 243, *melanocrepis*, fig. 10, Panama, *ocelligera*, fig. 8, Mexico, British Honduras, Guatemala, *zunilensis*, Guatemala, p. 244, and *decolor*, Panama, p. 245, *id. l. c.* pl. xii.

Loxopeza högei [*hœgii*], fig. 1, *xanthogaster*, Mexico, p. 218, *guatemalena*, Guatemala, *costulata*, *urania*, fig. 2, *translucens*, fig. 4, p. 219, *cyane*, fig. 3, *exarata*, fig. 5, Mexico, and *eburata*, fig. 6, Panama, p. 221, *id. l. c.* pl. x.; *L. angustula*, Chaudoir, Col. Nov. i. p. 19, Peru.

Amblystomus levantinus, Ionian Islands, Morea, and *rectangulus*, Dalmatia, Corfu, Syria, Reitter, Wien. ent. Z. ii. pp. 140 & 143.

Tetragonoderus aricollis and *luridus*, Quedenfeldt, B. E. Z. xxvii. pp. 252 & 253, pl. iii. figs. 5 & 6, Malange; *T. intermixtus*, Mexico, Guatemala, *simplex*, Guatemala, and *pœcilus*, pl. vii. fig. 7, Mexico, Guatemala, Bates, *l. c.* p. 172.

Nem [*at*] *otarsus rhombifer*, pl. vii. fig. 8, and *limbicollis*, id. *l. c.* p. 173, both from Mexico and Guatemala.

Perigona acupalpoides, p. 264, *discipennis*, *sinuata*, and *tachyoides*, p. 265, *id.* Tr. E. Soc. 1883, Japan.

Dolichoctis ornatellus, id. *l. c.* p. 282, Japan; *D. tenuilimbata*, Oberthür, Notes Leyd. Mus. v. p. 219, Sumatra.

Crossoglossa politissima, Chaudoir, *l. c.* p. 20, New Caledonia.

Gallerucidiides.

Gallerucidia crotyloides, Mexico, Guatemala, and *championi*, pl. ix.

fig. 21, Guatemala, spp. nn., Bates, Biol. Centr. Am. *Col.* i. (1) pp. 215 & 216.

Pericalides.

Bates, Biol. Centr. Am. *Col.* i. (1) pp. 175–216. specially noticed or figured *Stenognathus quadricollis*, Chaud., fig. 9, *Phlœoxena graphiptera*, Chaud., var., *Catascopus obscuro-viridis*, Chevr., *chontalensis* and *angulicollis*, fig. 14, Bates, *Coptodera elongata*, Putz., fig. 15, *scintillans*, Bates, *acutipennis*, Buq. (= *spinipennis*, Bates), *flavo-disca*, Chaud., fig. 16, and var. *immaculipennis*, *cupreo-tincta*, Bates (= *amazonica*, Chaud.), fig. 17, *Stenoglossa transversa*, Reiche (= *atriceps*, Bates), *vigro-striata*, Reiche (= *variegata*, Chaud., *pallida*, Bates, and *Dromius multiguttatus*, Putz.), *Eurycoleus belti*, Bates, fig. 19, *Pentagonica trivittata*, Dej. (= *Rhombodera virgata*, Reiche), *bifasciata*, Chaud., fig. 24, pl. ix.

Pamponerus, Fairmaire, preoccupied, renamed by him *Holoponerus*; Ann. Ent Belg. xxvii. (2) p. 2.

Ectinochila, g. n., Chaudoir, Col. Nov. i. p. 21. Allied to *Stenoglossa*; ligula much shorter, mentum not dentated, &c. Type, *E. tessellata*, spc n., *l. c.* p. 22, Moreton Bay.

New species:—

Euproctus metricus, Mexico, *fenestrellus*, fig. 10, Guatemala, p. 194, *quadrinus*, fig. 11, Panama, *ornatellus*, fig. 15, Guatemala, *deliciolus*, fig. 13, Panama, p. 195, *subdeletus*, fig. 9, Mexico, Guatemala, *sigillatus*, fig. 14, Mexico, and *abjectus*, fig. 12, Mexico, Guatemala, p. 196, Bates, Biol. Centr. Am. *Col.* i. (1) pl. viii.

Eurycoleus octo-signatus and *ornatus*, pl. vii. fig. 20, *id. l. c.* p. 186, Mexico.

Phlœoxena megalops, Guatemala, Panama, and *högei* [*hægii*], Mexico, *id. l. c.* pp. 177 & 178, pl. vii. figs. 11 & 12.

Menidius circumseptus, *incultus*, Guatemala, and *formosus*, Mexico, Guatemala, *id. l. c.* p. 197, pl. viii. figs. 16-18.

Otoglossa marginella, id. *l. c.* p. 199, pl. viii. fig. 24, Panama.

Aspasiola lemoides, id. *l. c.* p. 201, pl viii. fig. 21, Panama.

Pentagonica angulosa, id. Tr. E. Soc. 1883, p. 286, Japan; *P. gonostigma*, fig. 22, *omostigma* (wrongly *homostigma*, fig. 23), Panama, *picticornis*, fig. 25, pl. ix., Guatemala, *semifulva*, Mexico, Guatemala, *maculicornis*, Panama, p. 217, and *albipes*, Guatemala, Panama, p. 218, *id.* Biol. Centr. Am. *Col.* i. (1).

Coptodera piligera, Chaudoir, *l. c.* p. 20, Mou-pin; *C. japonica*, Bates, Tr. E. Soc. 1883, p. 281, pl. xiii. fig. 4, Japan; *C. championi*, Panama, p. 180, *chloris*, Mexico, p. 182, and *pœcila*, pl. vii. fig. 18, Panama, p. 183, *id.* Biol. Centr. Am. *Col.* i. (1).

Stenoglossa lineata, id. *l. c.* p. 184, pl. vii. fig. 21, Mexico to Pan[illegible]

Lelis insculpta, id. *l. c.* p. 185, pl. vii. fig. 22, Panama.

Lioptera erotyloides, pl. xiii. fig. 5, Japan, p. 280, and *plato*, N. B[illegible] p. 281, note, *id.* Tr. E. Soc. 1883.

Catascopus ignicinctus, id. *l. c.* p. 280, Japan; *C. gracilis*, Oberthür, Notes Leyd. Mus. v. p. 220, Sumatra, Mindanao; *C. laticollis*, Macleay,

P. Linn. Soc. N. S. W. viii. p. 410, Cape York (?); *C. cupricollis*, Chaudoir, Col. Nov. i. p. 24, Fly River, New Guinea; *C. guatemalensis*, Bates, Biol. Centr. Am. *Col.* i. (1) p. 178, pl. vii. fig. 13, Guatemala.

Pseudomorphides.

Pseudomorpha, Kirby. Synopsis of N. America species; Horn, Tr. Am. Ent. Soc. x. pp. 273–275.

Pseudomorpha pilatii, Chaud., noticed and figured; Bates, *l. c.* p. 255, pl. xii. fig. 25.

Pseudomorpha augustata [sic], sp. n., Horn, *l. c.* p. 274, pl. ix. fig. 6, Arizona.

Ozænides.

Pseudozæna alternata, Bates, = *Acanthophthalmus tricostata*, Montr.; Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 3.

Graphipterides.

Graphipterus. List of species taken by Fritsch in S. Africa, including a var. of *G. suturalis*; Chaudoir, Col. Nov. i. p. 26.

Graphipterus fritschi and *cinctus*, id. *l. c.* p. 25, S. Africa; *G. albomarginatus*, Quedenfeldt, B. E. Z. xxvii. p. 253, Malange: spp. nn.

Anthiides.

Anthia mannerheimi, Chaud., noticed; Von Heyden, Deutsche E. Z. xxvii. p. 354. *A.* (*Polyhirma*) *graphipteroides*, Guér., var. noticed; Dohrn, S. E. Z. xliv. p. 281.

Anthia septemcostata, pp. 281 & 357, *æmiliana*, p. 358, *westermani*, p. 359, *A.* (*Polyhirma*) *neutra* [noticed at p. 263 as *A.* (*P.*) *fovesta*, Perr.], p. 360, *id. l. c.*, Zambesi; *A. pachyoma*, Chaudoir, Col. Nov. i. p. 26, Transvaal: spp. nn.

Polyhirma boucardi, Transvaal, and *fritschi*, S. Africa, *id. l. c.* p. 27, spp. nn.

Morionides.

Morio japonicus, sp. n., Bates, Tr. E. Soc. 1883, p. 242, Japan.

Stereostoma batesi, sp. n., Quedenfeldt, B. E. Z. xxvii. p. 254, pl. iii. fig. 7, 7*a*, *b*, Malange.

Scaritides.

Anomoderus, Chaud., = *Anomophænus*, Fauv.; and as both names are pre-occupied, the genus is renamed *Scaritoderus*: Fairmaire, Bull. Soc. Ent. Ston(6) iii. p. lv., note.

Ani *ia batesi*, Lewis, figured; Waterhouse, Aid, ii. pl. cxxv. fig. 3.

Le *præcox*, Saulcy, var. *baudii* from Sicily described; Ragusa, Sil. ii. p. 246.

New species:—

Eutoma punctipenne [*-nis*], Macleay, P. Linn. Soc. N. S. W. viii. p. 411, ality unknown.

Carenum terræ-reginæ, Albania Downs, p. 411, *ianthinum*, *devisi*, and *pusillum*, locality unknown, p. 412, Macleay, *l. c.*

Mouhotia convexa, Lewis, Ent. M. M. xix. p. 193, and Waterhouse, Aid, ii. pl. cxxix. fig. 1, Laos.

Scarites passaloides, p. 256, *malangensis*, Malange, *strigiceps* and var. *lævipennis*, p. 257, and *cultripalpis*, pl. iii. fig. 8 (head), Quango, p. 258, Quedenfeldt, B. E. Z. xxvii.; *S. rapax*, Fairmaire, Le Nat. v. p. 364, Madagascar.

Scaritoderus loyolæ, Fairmaire, Bull. Soc. Ent. Fr. (6) iii. p. lv., India.

Scapterus riparius and *figuloides*, Gestro, Ann. Mus. Genov. xviii. pp. 299 & 301 (tibiæ figured), Burma.

Thlibops puncticollis, id. *l. c.* p. 302 (front tibiæ figured), Burma.

Dyschirius yezoensis and *glypturus*, Bates, Tr. E. Soc. 1883, pp. 232 & 233, Japan.

Clivina interstitialis, Kolbe, B. E. Z. xxvii. p. 18, Chinchoxo.

Holoprizus putzeysi, R. Oberthür, C.R. ent. Belg. xxvii. p. xl., Addah (Gold Coast).

Pamborides.

Tefflus megerlii, Fabr., and *delegorguii*, Guér., differentiated, with remarks on the other species of the genus, and the description of a new one; Quedenfeldt, B. E. Z. xxvii. pp. 269–276 (*cf.* also Dohrn, S. E. Z. xliv. pp. 283 & 284.

Pamborus viridi-aureus, sp. n., Macleay, P. Linn. Soc. N. S. W. viii. p. 409, Brisbane (?).

Tefflus hacquardi and *cribriceps* (pl. i. fig. 4, ined.), Chaudoir, Col. Nov. i. p. 29, Zanzibar; *T. brevicostatus*, Quedenfeldt, B. E. Z. xxvii. p. 275, pl. iii. fig. 14, Ushambala, 2° north of Bagamoyo: spp. nn.

Panagæides.

Epicosmus mandarinus, Schaum, noticed; Gestro, Ann. Mus. Genov. xviii. pp. 304 & 305.

Panagæus quadripustulatus, Sturm, var. *communimacula* from Santa Agnese described; Fiori, Atti Soc. Mod. xvii. p. 23.

New species:—

Eudema sundaicum, Oberthür, Notes Leyd. Mus. v. p. 221, Sumatra; *E. magnicolle*, Quedenfeldt, B. E. Z. xxvii. p. 260, pl. iii. fig. 9, Malange; *E. fuscicorne*, Kolbe, B. E. Z. xxvii. p. 18, Chinchoxo.

Brachyonychus punctipennis, Gestro, Ann. Mus. Genov. xviii. p. 305, Laos.

Stomonaxus lævicentris, Bates, Tr. E. Soc. 1883, p. 290, Japan.

Peronomerus auripilis, id. *l. c.* p. 235, Japan.

Dischissus borneensis, Frivaldsky, Term. füzetek, vi. p. 134, Bo

Chlæniides.

Chlænius maximiliani, Har., = *raffrayi*, Chaud.; *C. patricius*, Hope, redescribed, *C. viduus*, Horn, noticed, and *C. aberrans* (Chaud., MS.), Bates, redescribed: Chaudoir, Col. Nov. i. pp. 33 & 36. *C. pugni*, Came

redescribed; Gestro, Ann. Mus. Genov. xviii. pp. 306 & 307. *C. laticollis*, Say: pupa described and figured; Schaupp, Bull. Brooklyn Soc. v. p. 18, pl. i. fig. 5.

Hololius. Generic characters noticed; it has much affinity with the *Oodidæ*: Chaudoir, *l. c.* pp. 37 & 38.

Ectenognathus, Murray. Generic characters noticed; *id. l. c.* p. 37.

New genera and species :—

Sphærodes, Chaudoir, Ann. Soc. Ent. Fr. (6) ii. [1882] p. 519. Allied to *Prionognathus*, but nearly round and convex, and differing in the structure of the mouth. Type, *Oodes striatus*, Dej.

Holcocoleus, id. *l. c.* p. 521. Palpi long and very slender, the penultimate joint much longer than the last; ♂ with three first joints of front tarsi dilated and quadrate. Type, *Oodes sulcatulus*, Chaud. [This and the preceding genus were accidentally omitted from Zool. Rec. xix.]

Chlænius (*Vertagus*) *hacquardi* (pl. ii. fig. 10, ined.), Zanzibar, *C. pleuroderus*, E. Indies, p. 30, *stenotrachelus*, Natal, *neocaledonicus*, New Caledonia, p. 31, *fasciger*, Natal, *subelongatus*, Bagamoyo, p. 32, *mouhoti*, Laos, p. 33, *communimacula*, Natal, p. 34, and *zanzibaricus*, Bagamayo, p. 35, Chaudoir, Col. Nov. i.; *C. ovalipennis*, pl. iii. fig. 10, Quango, and *cuprithorax*, Malange, Quedenfeldt, B. E. Z. xxvii. pp. 260 & 261; *C. occultans* and *guineensis*, Kolbe, B. E. Z. xxvii. p. 16, Chinchoxo.

Licinides.

Dicælus dilatatus, Say. Pupa described; Schaupp, Bull. Brooklyn Soc. v. p. 18.

Cnemacanthides.

Broscosoma elegans, Bates, = *Miscodera denitzi*, Har.; Bates, P. E. Soc. 1883, p. xxxi.

Barypus pulchellus, Burm., noticed; Dohrn, S. E. Z. xliv. p. 105.

Broscosoma elegans, sp. n., Bates, Tr. E. Soc. 1883, p. 233, pl. xiii. fig. 7, Japan.

Barypus nigripennis, sp. n., Oberthür, Col. Nov. i. p. 38 (pl. ii. fig. 3, ined.), Monte Video.

Stomides.

Dispharicus gambianus, Waterh., var. or sp. n. (?) *quangoanus* from the Quango described and figured; Quedenfeldt, B. E. Z. xxvii. p. 262, pl. iii. fig. 11.

Stomis prognathus, sp. n., Bates, Tr. E. Soc. 1883, p. 252, Japan.

Anisodactylides.

Lecanomerus fuliginosus, Broun, figured; Waterhouse, Aid, ii. pl. xxviii. fig. 3.

Orthogonius hageni, Oberthür, Notes Leyd. Mus. v. p. 222, Sumatra; *O. alutaceus*, Malange, Quango, and *impunctipennis*, Malange, Quedenfeldt, B. E. Z. xxvii. pp. 264 & 265; spp. nn.

Anisodactylus limbatus, sp. n., Quedenfelt, B. E. Z. xxvi. p. 266, Malange.

Lecanomerus marginatus, sp. n., Sharp, Ent. M. M. xx. p. 25, New Zealand.

Harpalides.

Pseudophonus hospes, Sturm, var. *retowskii* from the Crimea described; Von Heyden, Deutche E. Z. xxvii. p. 310.

Harpalus semipunctatus, Dej. (= *limbo-punctatus*, Fuss), discussed; it is probably a local variety of *H. æneus*, Fabr.: Hübner, S. E. Z. xliv. pp. 175 & 176. *H. caliginosus*, Fabr., figured, to exhibit external structure; Horn, Bull. Brooklyn Soc. v. p. 84.

Acupalpus luridus and *exiguus*, Dej., are probably distinct; Rey, Rev. d'Ent. ii. p. 118.

Acinastes, Schaum. Generic characters discussed; Quedenfeldt, B. E. Z. xxvii. pp. 283–285.

New genera and species:—

Harpalidium, Kolbe, B. E. Z. xxvii. p. 17. *Harpalinæ*; mentum with no middle tooth; last joint of the palpi acuminate; elytra with the 3rd, 5th, and 8th interstices with seven deep points, and their sides very closely and thickly punctured. Type, *H. punctigerum*, sp. n., *ibid.*, Chinchoxo.

Iridessus, Bates, Tr. E. Soc. 1883, p. 240. Allied to *Stenolophus*, but form of *Harpalus*. Types, *H. lucidus*, Mor., and *H. relucens*, Bates.

Artabas, Des Gozis, MT. schw. ent. Ges. vi. [1882] pp. 287 & 288. Differs from all other French *Harpalinæ* in having from seven to nine setigerous pores along the lateral border of the thorax, that in the middle larger than all the others. Type, *H. punctato-striatus*, Dej.

Hypolithus murinus, Kolbe, B. E. Z. xxvii. p. 16, Chinchoxo.

Ophonus constrictus, Bates, Tr. E. Soc. 1883, p. 235, Japan.

Harpalus leptopus, p. 237, *chlorizans*, Japan, p. 238, *crates*, China, p. 239, note, and *variipes*, Japan, p. 239, *id.* l. c.; *H. maculiventris*, Quedenfeldt, B. E. Z. xxvii. p. 267, Malange; *H. latiusculus*, Kolbe, *l. c.* p. 17, Chinchoxo.

Dioryche ludifica, p. 16, *æmulatrix* and *tibialis*, p. 17, Kolbe, *l. c.*, Chinchoxo.

Stenolophus læviceps, id. *l. c.* p. 17, Chinchoxo; *S. agonoides*, Bates, *l. c.* p. 241, Japan; *S.* (*Acupalpus*) *angolensis*, Quedenfeldt, B. E. Z. xxvii. p. 267, Malange.

Trigonotomides.

Trigonotoma fulgidicollis, Cast., redescribed; Gestro, Ann. Mus. Genov. xviii. p. 309.

Trigonotoma comotti, sp. n., *id. l. c.* p. 308, Burma.

Triplogenius insignis, sp. n., *id. l. c.* p. 310, Sarawak, Labuan.

Drimostoma novæ-britanniæ, Fairmaire, Le Nat. v. p. 238, New Britain; *D. subsinuatum*, Chaudoir, Col. Nov. i. p. 38, Fly River, New Guinea: spp. nn.

Feroniides.

Feronia regularis, Fisch., and allies, discussed; Reitter, Deutsche E. Z. xxvii. pp. 76–80. *F. tieffenbachi*, Schaum, = *rebellis*, Reiche; *id.* Wien. ent. Z. ii. p. 178.

Omaseus niger, Schall. ♀ with left hind tarsus deformed; Engels, C.R. ent. Belg. xxvii. pp. cxxxviii. & cxxxix., fig.

Lophoglossus strenuus, Lec. On its very local habits; Fuchs, Bull. Brooklyn Soc. v. p. 81.

Steropus concinnus with malformed thorax; De Borre, C.R. ent. Belg. xxvii. p. cxxix.

Tanythrix. Reitter gives full analytical descriptions of *T. margine-punctata*, Dej., *edura*, Dej. (of which *T. heydeni*, Hopff., = *corpulenta*, Chaud., represents large ♀), and *senilis*, Schaum; Wien. ent. Z. ii. pp. 255–257. *T. edura* and *margine-punctata*, Dej., discussed; the latter = *edura*, Jacq. Duv., Chaud.; and *corpulenta*, Chaud., is the ♀ of the former: Von Heyden, Wien. ent. Z. ii. pp. 121 & 122.

Tapinopterus duponcheli, Dej., redescribed; Reitter, *l. c.* p. 181.

New species:—

Feronia svanetica, obtusangula, p. 78, and *rudestriata*, p. 79, Reitter, Deutsche E. Z. xxvii., Svanetia.

Trigonognatha aurescens, Japan, p. 243, and *maxima*, China, p. 243, Reitter, Tr. E. Soc. 1883.

Allotriopus hoplites, id. *l. c.* p. 244, Japan.

Eucamptognathus abaciformis, Fairmaire, Le Nat. v. p. 364, Madagascar.

Pœcilus lævis, Macleay, P. Linn. Soc. N. S. W. viii. p. 414, Port Darwin.

Lagarus dulcis, Bates, *l. c.* p. 251, Japan.

Pedius tauricus, Von Heyden, Deutsche E. Z. xxvii. p. 71, Tauria.

Hypherpes colonus, Bates, *l. c.* p. 244, Japan.

Tanythrix heydeni, Hopffgarten, Wien. ent. Z. ii. p. 119, Siebenbürgen (*cf.* also Reitter, *tom. cit.* p. 180).

Tapinopterus punctato-striatus, Von Heyden, Wien. ent. Z. ii. p. 119, Greece (= *protensus*, Schaum, sec. Reitter, *tom. cit.* pp. 180 & 181).

Pterostichus walteri, Reitter, Wien. ent. Z. ii. p. 224, Montenegro; *P. macrogenys, pachinus, asymmetricus*, p. 245, *spiculifer, mirificus*, p. 246, *P.* (*Omaseus*?) *polygenus*, p. 247, *P. sejunctus, P.* (*Omaseus*?) *defossus*, p. 248, *P.* (*O.*) *leptis*, p. 249, and *P.* (*O.*) *ambigenus*, p. 250, Bates, *l. c.* Japan; *P.* (*Steropus*) *helmsi*, Sharp, Ent. M. M. xx. p. 25, New Zealand.

Tibarisus robustus, Macleay, *l. c.* p. 414, locality unknown.

Zabrus arragonensis, Arragon, *taygetanus*, Greece, *forcipennis*, Asia Minor, *hellenicus*, Greece, and *balcanicus*, Balkans, Von Heyden, Deutsche E. Z. xxvii. pp. 305–309.

Bradytus macros, Bates, *l. c.* p. 241, Japan.

Amara (*Celia*) *viridescens*, Reitter, Rev. mens. Ent. i. p. 70, Caucasus.

Anchomenides.

Calathus vage-striatus and *parvicollis*, Fairmaire, redescribed by him; Ann. Soc. Ent. Fr. (6) iii. p. 90.

Pristodactyla caucasica, Chaud., redescribed; Reitter, Deutsche E. Z. xxvii. pp. 79 & 80.

New genera and species :—

Eucalathus, Bates, Tr. E. Soc. 1883, p. 253. Allied to *Calathus*. To include *Pristonychus æneolus*, Bates, probably *Calathus nitidulus*, Mor., and *E. colpodoides* and *atricolor*, spp. nn., *l. c.* pp. 254 & 288, Japan.

Trephionus, id. *l. c.* p. 255. Allied to *Calathus* and *Pristonychus*, but with a superficial resemblance to *Anchomenus*. Type, *T. nikkoensis*, sp. n., *ibid.*, Japan.

Tarastethus, Sharp, Ent. M. M. xx. p. 23. Differs from *Cyclothorax* by the convex form, the remarkably abbreviate metasternum, and the structure of the male tarsi. Types, *T. puncticollis* and *læviventris*, spp. nn., *l. c.* p. 24.

Pristodactyla crocata, Bates, Tr. E. Soc. 1883, p. 288, Japan.

Agonum robustum, Quedenfeldt, B. E. Z. xxvii. p. 268, Malange.

Anchomenus (*Platynus*) *xestus*, *callides*, p. 256, *A.* (*Agonum*) *sculptipes*, *A.* (*A.*) *suavissimus*, p. 257, *A.* (*A.*) *oguræ*, and *A.* (*A.*) *charillus*, p. 258, Bates, *l. c.*, Japan.

Platynus nivalis, Santa Fé, and *sulcipennis*, Florida, Horn, Tr. Kansas Ac. vii. [1881] pp. 74 & 75.

Megalonychus subæneus, Kolbe, B. E. Z. xxvii. p. 16, Chinchoxo.

Crepidactyla melantho, Bates, *l. c.* p. 254, Japan.

Colpodes bentonis, p. 258, *mutator*, *integratus*, p. 259, *astictus*, *enoloi*, *phinomus*, p. 260, *limodromoides*, *elainus*, p. 261, *chloreis*, p. 2[illegible] *paurelius*, *rubriolus*, p. 263, *eurydamas*, p. 288, and *pryeri*, p. 289, *id. l. c.*, Japan.

Trechides.

Anophthalmus, Sturm. Synopsis of N. American species; Horn, Tr. Am. Ent. Soc. x. pp. 270–272. *A. acherontius*, Schauf., = *reitteri*, Mill., according to Reitter, Bull. Soc. Ent. Fr. (6) iii. pp. viii & ix.

Trechus oreas and *vicarius*, Bates, Tr. E. Soc. 1883, pp. 266 & 267, Japan; *T. hydropicus*, Horn, Tr. Am. Ent. Soc. x. p. 273, Virginia; *T.* (*Anophthalmus*) *villardi*, Bedel, Bull. Soc. Ent. Fr. (6) iii. p. xxxvii., France; *T.* (*A.*) *dacicus*, Frivaldsky, Term. füzetek, vii. p. 9, Hungary: spp. nn.

Anophthalmus nakeralæ, Reitter, Rev. mens. Ent. i. p. 71, Caucasus; *A. audax*, Horn, *l. c.* p. 272, Ronald's Cave, N. America: spp. nn.

Pogonides.

Patrobus longicornis, Say. Larva figured with details; Bull. Brooklyn Soc. v. p. 18, pl. i. figs. 2, 2*a–d*.

Penetretus ambiguus and *dilatatus*, spp. nn., Bates, Tr. E. Soc. 1883, pp. 289 & 290, Japan.

Anchonoderides.

Bates, Biol. Centr. Am. *Col.* i. (1), redescribes or specially notices *Lachnophorus semirufus*, B., fig. 16, p. 154, *sculptifrons*, B., fig. 17, *longulus*, B., p. 155, *Euphorticus pubescens*, Dej. (= *Lachnophorus niger*,

Gory, and *lævicollis*, Reiche), *leucoscelis*, B., p. 156, *Calybe belti*, B., and *Ega sallæi*, Chevr., fig. 15, pl. vi. p. 157.

Lachnophorus humeralis, pl. vi. fig. 14, *guttulatus*, both from Guatemala and Panama, p. 153, *corrosus*, Panama, and *subauratus*, Guatemala, p. 154, spp. nn., Bates, Biol. Centr. Am. *Col.* i. (1).

Selina ritsemæ, sp. n., Oberthür, Notes Leyd. Mus. v. p. 223, Sumatra.

Bembidiides.

Bembidium varium, Oliv., noticed as new to Sweden; Sahlberg, Medd. Soc. Fenn. ix. p. 150.

Amphizoa, Sharp, discussed as an isolated form; Horn, Tr. Am. Ent. Soc. x. p. 275.

New genera and species :—

Geocharis, Ehlers, Deutsche E. Z. xxvii. p. 31. Allied to *Anillus*; ligula connected with the paraglossæ, anterior margin bilobed, lobes rounded. Types, *A. cordubensis* and *massinissæ*, Dieck.

Dicropterus, id. *l. c.* p. 32. *Bembidiidæ*; exact affinities not stated. Type, *Scotodipnus brevipennis*, Friv.; add *D. quadricollis*, sp. n., *ibid.*, Subiaco.

Acrotyphlus guadarramus, id. *l. c.* p. 32, Mountains of Guadarrama.

Trichys reflexicollis and *euglyptus*, Bates, Tr. E. Soc. 1883, p. 268, Japan.

Bembidium convergens (Chaud., MS.) and *chaudoiri* (*luridipenne*, Chaud., MS., *nec* Schaum), Berg, S. E. Z. xliv. pp. 394 & 395, Buenos Aires; *B.* (*Lopha*) *pædiscum*, *B. tetraporum*, *aureo-fuscum*, p. 270, *pliculatum*, *B.* (*Peryphus*) *lucillum*, p. 271, *B.* (*P.*) *amaurum*, *B. nikkoense*, p. 272, *B.* (*P.*) *cnemidotum*, *B.* (*P.*) *oxyglymma*, p. 273, *B.* (*P.*) *eurygonum*, *B.* (*P.*) *sanatum*, p. 274, *B.* (*P.*) *semiluitum*, *B. leucolenum*, p. 275, *B.* (*Hydrium*) *pogonoides*, *B. æneipes*, p. 276, and *B. chloropus*, p. 277, Bates, *l. c.*, Japan

Cillenum yokohamæ, id. *l. c.* p. 268, Japan.

Dytiscidæ.

Everts, E. Bijdrage tot de kennis der in Nederland voorkomende *Haliplidæ*. Tijdschr. Ent. xxvi. pp. 87–103.

17 species discussed, belonging to the 3 genera *Peltodytes*, Régimb. (1) *Haliplus*, Latr. (15), and *Brychius*, Thoms. (1).

Kolbe, H. J. Ueber die madagascarischen Dytisciden des königl. entomologischen Museums zu Berlin. Arch. f. Nat. xlix. pp. 383–427.

The paper commences with a long discussion on the origin and characteristics of the fauna of Madagascar. 69 species from Madagascar and the adjacent islands are enumerated, 43 being described from specimens.

Analysis of Sharp's *Dytiscidæ*; Bergroth, S. E. Z. xliv. pp. 129–135.

Critical and synonymic notes (too numerous for detailed notice) on the North American *Dytiscidæ* described by Sharp; Horn, Tr. Am. Ent. Soc. x. pp. 276–282.

On rearing larvæ of *Dytiscidæ*; Barbier, Feuill. Nat. iii. p. 103.

Pachytes elegans, Montr., *australis* and *caledoniæ*, Clark, and *illigeri*, Perr., are synonyms, p. 339; *Rhantus pulverosus*, Steph., and ? *montrouzieri*, Luc., = *punctatus*, Fourcr., p. 342; *Cybister temmenki*, Aubé, *gostchi*, Hoch., *immaculatus*, *novæ-caledoniæ*, and *artensis*, Montr., = *tripunctatus*, Oliv., pp. 345 & 346: Fauvel, Rev. d'Ent. ii.

Hydroporus granularis, Linn., and *bilineatus*, Sturm, discussed; Sahlberg, Medd. Soc. Fenn. ix. pp. 133 & 134.

Canthydrus auritus, Reg., = *semperi*, Wehncke; Wehncke, Deutsche E. Z. xxvii. p. 149.

Laccophilus insignis, Sharp, and *pictus*, Lap., noticed and figured; Horn, Tr. Am. Ent. Soc. x. pp. 277 & 283, pl. ix. figs. 1 & 2.

Agabus chalconotus, Panz., and *fusco-æneseens*, Régimb., discussed; the latter is a well-marked form, but not truly distinct: Baudi & Régimbart, Nat. Sicil. iii. pp. 7, 8, 38, & 39.

Dytiscus. Longevity in *D. raseli* (amounting in one case to 5½ years); the ova apparently only develop, even after fertilization, under favourable conditions; cannibalism and voracity of *D. lapponicus*: Sharp, Ent. M. M. xix. pp. 260 & 261. *D. latissimus*: structure, colouring, and ferocity of male; Doebner & Dohrn, S. E. Z. xliv. pp. 388–390.

Eunectes succinctus, Klug, = *sticticus*, Linn., var.; Dohrn, S. E. Z. xliv. pp. 361 & 362.

Hydaticus clairvillii, Montr., and *dorsalis*, Luc., = *gorii* and *co[illegible] guineus*, Aubé, respectively; *H. congestus*, Klug, and *rochasi*, Montr[illegible] *signatipennis*, Cast.: Fauvel, Rev. d'Ent. ii. p. 344.

Hydatonychus, g. n., Kolbe, Arch. f. Nat. xlix. p. 402. Allied to *Hydrovatus*; middle joints of antennæ much thickened, front claws extremely developed. Type, *H. crassicornis*, sp. n., *l. c.* p. 403, Madagascar.

New species:—

Haliplus nigro-lineatus, Monte Video, *siculus*, Sicily, p. 145, and *brandeni*, St. Domingo, p. 146, Wehncke, Deutsche E. Z. xxvii.

Cnemidotus mexicanus, id. *l. c.* p. 145, Mexico.

Hygrobia davidi, Bedel, Bull. Soc. Ent. Fr. (6) iii. p. xxiii., Kiang-Si, China.

Derovatellus orientalis, Wehncke, *l. c.* p. 149, Borneo.

Bidessus perexiguus and *plagiatus*, Kolbe, Arch. f. Nat. xlix. p. 407, Madagascar; *B. noteroides*, Régimbart, Notes Leyd. Mus. v. p. 227, Java.

Pachydrus ritsemæ, id. *l. c.* p. 226, Brazil.

Hydrovatus dilutus, *cruentatus*, and *subpunctatus*, Kolbe, *l. c.* pp. 403–405, Madagascar.

Hydroporus pectoralis, Sahlberg, Medd. Soc. Fenn. ix. p. 133, Finland (in the male, the metasternum, the inner side of the hind coxæ, and trochanters are clothed with a thick felt of short silky hair, which, [illegible] the female, extends to the suture of the elytra); *H. palliatus*, Cal[illegible] *picturatus*, fig. 4, p. 283, and *quadrimaculatus*, fig. 5, Western [illegible] p. 284, Horn, Tr. Am. Ent. Soc. x. pl. ix.; *H.* (*Deronectes*) *septemv*[illegible] Régimbart, *l. c.* p. 228, Bahr-el-Abiad.

Hydrocoptus koppi, Addah, West Africa, and *sharpi*, Borneo, Wehncke, *l. c.* pp. 146 & 147.

Noterus granulatus, Régimbart, *l. c.* p. 225, China.

Hydrocanthus micans, Wehncke, *l. c.* p. 149, Addah, West Africa; *H. gracilis*, Kolbe, *l. c.* p. 400, Madagascar.

Canthydrus bisignatus, *maculatus*, *koppi*, Addah, West Africa, p. 148, and *javanus*, Java, p. 149, Wehncke, l. c.; *C. serialis*, Fauvel, Rev. d'Ent. ii. p. 336, Noumea, New Caledonia.

Laccophilus assimilis, Régimbart, *l. c.* p. 226, Sumatra, Java; *L. seminiger*, Fauvel, *l. c.* p. 337, Kanala, New Caledonia; *L. lateralis*, Horn, *l. c.* p. 282, pl. ix. fig. 3, Arizona.

Lacconectus ritsemæ, Régimbart, *l. c.* p. 229, Java.

Rhantus alutaceus, Fauvel, *l. c.* p. 343, New Caledonia.

Platynectes procerus, Régimbart, *l. c.* p. 229, Java.

Copelatus elongatus, Kolbe, *l. c.* p. 411, Madagascar; *C. hæmorrhoidalis*, Aru, p. 229, *javanus*, Java, p. 230, *melanogrammus*, Timor, p. 231, and *fragilis*, Java, p. 232, Régimbart, *l. c.*

Cybister sumatrensis, id. *l. c.* p. 233, Sumatra; *C. convexisculus*, Kolbe, *l. c.* p. 420, Madagascar.

Trogus punctipennis, Taschenberg, Z. Naturw. lvi. p. 176, Socotra.

Hydaticus sellatus, Régimbart, *l. c.* p. 233, Celebes; *H. concolor* and *ornatus*, Kolbe, *l. c.* pp. 414 & 415, Madagascar.

Phil-aphoderes occidentalis, Horn, *l. c.* p. 281, California, Washington Fauvel, tory.

Hydr

GYRINIDÆ.

RÉGIMBART, M. Essai monographique de la famille des *Gyrinidæ*. 2e partie. Ann. Soc. Ent. Fr. (6) iii. pp. 121–190, pl. vi.

The paper commences with a description of the maxilla (composed of basal joint, stipes, triangular plate, squama, inner and outer lobes, mala interna and mala externa, and maxillary palpus) and of the front legs in the *Dytiscidæ* and *Gyrinidæ*. The second family of the *Gyrinidæ* (the *Gyrinini*) is then discussed, including only the two genera *Aulonogyrus*, Motsch., and *Gyrinus*, Geoffr., the species being fully described. The plate illustrates generic details. The following known species are illustrated or specially noticed:—*A. splendidulus*, Aubé, figs. 73 & 78, *concinnus*, Klug (=*striatus*, Aubé, *nec* Fabr.), figs. 71 & 80, *caffer*, Aubé (? = *flavipes*, Boh.), *Gyrinus minutus*, Fabr. (= *rockinghamensis*, Lec.), *urinator*, Ill., figs. 65*a–e* & 72, *fraternus*, Coup., fig. 82, *aquiris*, Lec. (= *limbatus*, Aubé), fig. 83, *plicifer*, Lec., fig. 84, *elongatus*, Aubé, fig. 85, *caspius*, Ménétr. (= *distinctus* and *libanus*, Aubé, and *colymbus*, Erichs.), *bicolor*, Fabr., fig. 86, *nitidulus*, Fabr., fig. 87, *convexiusculus*, Macl. (= *nitidulus*, p. Aubé), fig. 88, *curtus*, Motsch. (= *japonicus*, Sharp), *dejeani*, Brullé (= *æneus*, Aubé), *pernitidus*, Lec., fig. 74, *marinus*, Gyll. (= *opacus*, Sahlb., and *æneus*, Thoms.), fig. 89, *pectoralis*, Lec., p. 90, *borealis*, Aubé, fig. 76, *parcus*, Say (= *chilensis*, Aubé), *ovatus*, Aubé, fig. 93, *gibbus*, Aubé (= *apicalis*, Sharp), fig. 92, *crassus*, Aubé, fig. 95, and *chalybæus*, Perty, fig. 96.

——. Les Gyrinides d'Europe. Mém. Soc. L. N. Fr. 1883, pp. 107–120.

15 species described, belonging to 2 genera.

Pachytes elegans, Montr., *australis* and *caledoniæ*, Clark, and *illigeri*, Perr., are synonyms, p. 339; *Rhantus pulverosus*, Steph., and ? *montrouzieri*, Luc., = *punctatus*, Fourer., p. 342; *Cybister temmenki*, Aubé, *gestchi*, Hoch., *immaculatus*, *novæ-caledoniæ*, and *artensis*, Montr., = *tripunctatus*, Oliv., pp. 345 & 346: Fauvel, Rev. d'Ent. ii.

Hydroporus granularis, Linn., and *bilineatus*, Sturm, discussed; Sahlberg, Medd. Soc. Fenn. ix. pp. 133 & 134.

Canthydrus auritus, Reg., = *semperi*, Wehncke; Wehncke, Deutsche E. Z. xxvii. p. 149.

Laccophilus insignis, Sharp, and *pictus*, Lap., noticed and figured; Horn, Tr. Am. Ent. Soc. x. pp. 277 & 283, pl. ix. figs. 1 & 2.

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Hydrovatus dilutus, *cruentatus*, and *subpunctatus*, Kolbe, *l. c.* pp. 403–405, Madagascar.

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Hydrocoptus koppi, Addah, West Africa, and *sharpi*, Borneo, Wehncke, *l. c.* pp. 146 & 147.

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Canthydrus bisignatus, *maculatus*, *koppi*, Addah, West Africa, p. 148, and *javanus*, Java, p. 149, Wehncke, l. c.; *C. serialis*, Fauvel, Rev. d'Ent. [illegible]336, Noumea, New Caledonia.

ii. p. [illegible]*philus assimilis*, Régimbart, *l. c.* p. 226, Sumatra, Java; *L. seminiger*, Fauvel, *l. c.* p. 337, Kanala, New Caledonia; *L. lateralis*, Horn, l. c. p. 282, pl. ix. fig. 3, Arizona.

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Cy[illegible]ter sumatrensis, id. *l. c.* p. 233, Sumatra; *C. convexisculus*, Kolbe, [illegible] 420, Madagascar.

Progus punctipennis, Taschenberg, Z. Naturw. lvi. p. 176, Socotra.

Taticus sellatus, Régimbart, *l. c.* p. 233, Celebes; *H. concolor* and *H[illegible]* Kolbe, *l. c.* pp. 414 & 415, Madagascar.

[illegible]ornphoderes occidentalis, Horn, *l. c.* p. 281, California, Washington [illegible]tory.

GYRINIDÆ.

RÉGIMBART, M. Essai monographique de la famille des *Gyrinidæ*. 2e partie. Am. Soc. Ent. Fr. (6) iii. pp. 121–190, pl. vi.

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CUVIVIER, cation xxvi

——. Les Gyrinides d'Europe. Mém. Soc. L. N. Fr. 1883, pp. 107–120.

15 species described, belonging to 2 genera.

Dineutes leucopoda, Montr., = *australis*, Fabr.; Fauvel, Rev. d'Ent. ii. p. 348.

New species :—

Enhydrus albertisi, Régimbart, Ann. Mus. Genov. xviii. p. 70, Fly River, New Guinea.

Aulonogyrus wehnckii, Angola, p. 125, *elegantissimus* (Chevr., MS.), figs. 70, 75 & 77, Madagascar, p. 126, *subparallelus*, fig. 79, Cape, p. 128, *convexiusculus*, Delagoa Bay, p. 129, *abyssinicus*, Abyssinia, p. 132, *sharpi*, Caffraria, p. 136, *virescens*, Abyssinia, p. 138, *bedeli*, Gold Coast, Angola, *zanzibaricus*, Zanzibar, p. 139, *algoensis*, Algoa Bay, and *goudoti* (Dupont, MS., = *corinthius*, Chevr.), fig. 81, Madagascar, p. 140, Régimbart, Ann. Soc. Ent. Fr. (6) iii. pl. iv.

Gyrinus fairmairii, Mesopotamia, Bagdad, *tenuistriatus* (Chevr., MS.), Philippines, p. 144, *chalcopleurus*, Cape, p. 145, *rufiventris*, Cape, Madagascar, p. 146, *cubensis*, Cuba, p. 151, *oceanicus*, Philippines, *aegyptiacus*, Egypt, p. 155, *wankowiczi*, Minsk, p. 157, *[illegible]*, p. 159, *simoni*, Australia, p. 163, *ceylonicus*, Ceylon, p. [illegible], Java, p. 165, *caledonicus* (Fauvel, MS.), New Caledonia, [illegible], p. 167, *luctuosus*, Mesopotamia, Arabia, p. 168, *corpulentus*, [illegible], p. 178, *rugifer*, Guadeloupe, p. 179, *colombicus*, Colombia, p. [illegible], fig. 91, p. 181, *aequatorius*, Ecuador, p. 182, *plicatus* (Chevr., MS.), *obtusus*, Sharp, *nec* Say), Mexico, *opalinus* (Chevr., MS.), Brazil, p. [illegible], *sericeo-limbatus* (Deyr., MS.), Celebes, Philippines, Java, p. 185, and *violaceus*, fig. 94, Monte Video, p. 187, *id.-l. c.* pl. [illegible].

Dineutes pectoralis, id. Ann. Mus. Genov. xviii. p. 70, Aru, New Guinea.

Orectochilus gestroi, angulatus, p. 72, *pubescens*, p. 73, *pusillus*, p. 74, *id. l. c.*, Sarawak; *O. angustior*, Kolbe, B. E. Z. xxviii. p. 18, Chinchoxo.

Hydrophilidæ.

Sharp, D. Revision of the species included in the genus *Tropisternus* (fam. *Hydrophilidæ*). Trans. R. Soc. 1883, pp. 91–117.

33 species of *Tropisternus* and 2 of an allied genus are admitted, several others being noticed as doubtful. General remarks on structure are prefixed, and *Tropisternus* is divided into several sections and groups. The following synonymy occurs:—*T. scutellaris*, Cast. (= *Hydrophilus lepidus*, Brullé), *chalybeus*, Cast (= *nitudus*, Cast., and *Hydrophilus chalybeatus*, Curt.), *sublaevis*, Lec. (= *H. quadristriatus*, Horn), *dorsalis*, Brullé (= *H. limbalis*, Lec.). All the species are fully described.

Hydrophilus piceus and *atterimus*. Notes on structure; Doebner & Dohrn, S. E. Z. xliv. pp. 390 & 391.

Hydrobius, Leach. Table of Dutch species; Everts, Tijdsch. Ent. xxvi. pp. cxliv.–cxlvi. *H. fuscipes* and *rottenbergi* differ [illegible]; Wiepken, Abh. Ver. Brem. viii p. 101.

Berosus. Table of French species; Rey, Rev. d'Ent. ii. pp. 90 [illegible], *B. externespinosus*, Fairm., probably = *australis*, Muls.; Fauvel, Rev. d'Ent. ii. p. 356.

Limnobius and *Hydroscapha* differentiated, and the French species of the former tabulated; *L. furratus*, *nitidus* and *picinus*, Bedel, = *nitidus*, Muls., *sericans*, Rey, and *atomus*, Muls., respectively: Rey, Rev. d'Ent. ii. pp. 84–88. Sharp criticises Rey's remarks on *Hydroscapha*; op. cit. p. 117.

Spercheus priscus, Sharp, = *mulsanti*, Perr.; Fauvel, Rev. d'Ent. ii. p. 351.

Dactylosternum roussetti and *abdominale*, Woll., = *insulare*, Lap.; *id. l. c.* p. 358.

New genera and species :—

Pleurhomus, Sharp, Tr. E. Soc. 1883, p. 114. Allied to *Tropisternus*; epipleura not folded in till just before the extremity. Types, *T. obscurus*, Sharp, and *P. sahlbergi*, sp. n., *l. c.* p. 115, Santa Rita, Brazil.

Allocotocerus, Kraatz, Deutsche E. Z. xxvii. p. 14. Allied to *Amphiops*; eyes not divided, very prominent, scutellum sublinear. Type, *A. bedeli*, sp. n., *l. c.* p. 15, New Guinea.

Tropisternus proximus, Cuba, p. 97, *parananus*, Parana, p. 99, *breviceps*, Brazil, p 100, *flavipalpis*, Mexico, p. 102, *robustus*, Ecuador, p. 103, and *lancifer*, Colombia, p. 113, Sharp, Tr. E. Soc. 1883.

Hydrus caledonicus, *artensis*, p. 353, *nitescens* and *pullus*, p. 354, Rev. d'Ent. ii., New Caledonia.

Oxenus elevatus, id. *l. c.* p. 355. Yahoué, New Caledonia.

Berosus guttalis (= *spinosus* var. *B*, Muls.), Rey, *l. c.* p. 88, Nîmes; *B. albipes*, Isle of Nou, and *distigma*, Vata, Fauvel, *l. c.* p. 356.

Limnobius aluta and *sericans* (= *nitidus*, Bed., *nec* Muls.), Rey, *l. c.* p. 88, France.

Ochthobius caudalis, Frivaldsky, Term. füzetek, vii. p. 10, Transylvania; *O. velutinus*, Fairmaire, C.R. ent. Belg. xxvii. p. xlii., Biskra.

Hydræna cordata, Schaufuss, Rev. mens. Ent. i. p. 3, Portugal; *H. densa*, Fauvel, *l. c.* p. 350, Kanala.

Paracymus metallescens, id. *l. c.* p. 352, New Caledonia, Australia.

Dactylosternum auripes, id. *l. c.* p. 358, New Caledonia.

STAPHYLINIDÆ.

FAUVEL, A. Les Staphylinides de l'Afrique boréale. Bull. Soc. L. Norm. (3) ii. [1878] pp. 83–166.

——. Les Staphylinides de l'Amérique du Nord. *L. c.* [1878] pp. 157–266.

As these important papers have previously escaped notice in the Record, it has been thought desirable, owing to the many new genera and species which they include, to give them a place here. The second includes descriptions of known as well as of new species.

DUVIVIER, A. Énumération des Staphylinides décrits depuis la publication du Catalogue de Gemminger et de Harold. Ann. Ent. Belg. xxvii. (2) pp. 91–215.

The Munich Catalogue included 266 genera and 4130 species; we have now 371 genera and about 6649 species.

Quedenfeldt, M. Beiträge zur Kenntniss der Staphylinen-Fauna von Süd-Spanien, Portugal, und Marokko. 1. Reisebericht. B. E. Z. xxvii. pp. 149–163.

Saulcy, F. de. Description de plusieurs espèces aveugles de Staphylinides. Bull. Soc. Metz (2) xv. [1878] pp. 113–125.

13 species are described, the known ones being :—*Mayetia sphærifera*, Muls. & Rey, *Leptotyphlus sublævis*, Fauv., *exilis*, M. & R., *Cylindrogaster corsicus*, Perr., and *Octavius insularis*, Fauv.

Sharp, D. Biologia Centrali-Americana [*cf.* Godman, F. Ducane, & Salvin, O, *Insecta*, General Subject]. *Coleoptera*, vol. i. pt. 2, pp. 145–312, pls. v.–vii.

Includes *Staphylinidæ* from *Aleochara* to *Tachyporus*.

Aleocharides.

Sharp, Biol. Centr. Am. *Col.* i. (2) notices or figures *Aleochara bimaculata*, Grav., and varr. *duplicata*, Erichs., and *alticola* (n.), *notula*, Er. (= *signaticollis*, Fairm.), *verberans*, Er., *Myrmedonia flavicornis*, Solsky, pl. v. fig. 17 (*Tachyusa picticornis* and *extranea*, Sharp, belong to *Myrmedonia*), *Epipeda rufa*, Sharp, pl. vi. fig. 11, and *Gyrophæna pumila*, Sharp (pp. 147, 148, 200, 225, 240, & 254).

Captures of ants and ants' nest beetles (*Myrmedonia*, &c.); E. S[illegible], Ent. M. M. xx. pp. 18 & 19.

Aleochara anthomyiæ, Sprague, noticed and figured as destructive to the cabbage-fly (*Anthomyia brassicæ*, Bouché); Lintner, Rep. Ins. N. Y. i. p. 188, fig. 53.

Lomechusa strumosa, Fabr. (?). Larva described and figured ; Sahlberg, Medd. Soc. Fenn. ix. pp. 89–93, 147, & 148, pl. i.

Callicerus atricollis, Aubé, var. *fulvicornis* from Herzegovina and S. Hungary described ; Eppelsheim, Wien. ent. Z. ii. p. 255.

Atheta autumnalis, Muls., recorded as new to Finland ; *id. l. c.* p. 148.

Diglossa submarina, Fairm. (*sinuaticollis*, Rey). Supposed occurrence in Ireland ; Fowler, Ent. M. M. xx. p. 168.

Myllæna. British species discussed and redescribed ; 12 are admitted, including 5 new to Britain, 2 of which are new to science : Matthews, Cist. Ent. iii. pp. 33–44.

New genera and species :—

Maseochara, Sharp, Biol. Centr. Am. *Col.* i. (2) p. 154. Allied to *Polystoma*, Rey, but middle coxal cavities quite complete. To include *Aleochara semivelutina*, Solsky, and *M. opacella* (types), pl. v. fig. 2, p. 154, *robusta*, *gracilis*, Mexico, *depressa*, Guatemala, p. 155, and *duplicata*, Mexico to Panama, p. 156, spp. nn.

Ambodina, id. *l. c.* p. 157. Allied to *Microglossa* and *Aleochara* ; middle coxæ widely separated, palpi with no supplementary joint. Type, *A. granulata*, sp. n., *ibid.*, Mexico.

Ocyota, id. *l. c.* p. 163. Allied to *Homalota* ; intermediate coxæ more separated, and metasternum produced far forward between the coxæ. Type, *O. dubia*, sp. n., *ibid.*, Guatemala.

Tinotus, Sharp, *l. c.* p. 170. Allied to *Aleochara*; palpi with no definite supplementary joint, front tarsi apparently 4-jointed. Types, *T. cavicollis*, pl. v. fig. 6, and *flavescens*, spp. nn., *l. c.* pp. 170 & 171, Guatemala.

Leptonia, id. *l. c.* p. 196. Differs from *Myrmedonia* by the structure of the hind tarsi, and from *Thamiaræa* and *Homalota* by the more widely separated middle coxæ, with short, broad, mesosternal lobe. To include *Calodera syntheta*, Sharp, and *L. picta* (type), sp. n., *ibid.*, pl. v. fig. 15, Mexico to Panama.

Sceptobius, id. *l. c.* p. 211. Affinities doubtful; apparently related to *Falagria* and *Drusilla*. Type, *S. dispar*, sp. n., *l. c.* p. 212, pl. [illegible] fig. 23, Mexico.

Falagonia, id. *l. c.* p. 212. Allied to *Drusilla*, Rey, [illegible] of mesosternum simply margined. To include *F. mexicana* (type) from [illegible] v. fig. 24, Mexico, and *crassiventris*, Guatemala, Panama, spp. nn., [illegible], p. 213.

Platonica, id. *l. c.* p. 214. Intermediate between *Calodera* and *Homalota*. To include *P. major* (apparently the type?), Costa Rica, *sallæ*, pl. v. fig. 25, Mexico, p. 215, *intermedia*, Guatemala, Panama, *acuminata*, Mexico, p. 216, *centralis*, Guatemala, *latifrons*, pl. vi. fig. 1, p. 217, *chiriquensis*, Panama, and *fuscicollis*, Guatemala, p. 218, spp. nn.

Chodrus, id. *l. c.* p. 224. Allied to *Porus* (?). Type, *C. fodiens*, sp. n., *l. c.* p. 225, pl. vi. fig. 4, Panama.

Rechota, id. *l. c.* p. 228. Allied to *Gnypeta*; head slightly narrowed behind; neck broad; intermediate coxæ rather distant; apex of mesosternum and anterior point of metasternum truncate; hind tarsi slender; basal joint nearly as long as the two following joints together. Type *R. impressa*, sp. n., *l. c.* p. 229, pl. vi. fig. 5, Guatemala.

Merona, id. *l. c.* p. 229. Allied to *Falagria*; prosternum small; supracoxal portion truncate, prosternal portion membranous; intermediate coxæ somewhat widely separated; mesosternum hardly produced between the coxæ, and truncated at the tip. To include *F. venustula*, Er., ? *dete ciata*, Er., and *M. fragilis*, pl. vi. fig. 6, *brevicollis* and *polita*, spp. nn., *l. c.* p. 230, Guatemala.

Neolara, id. *l. c.* p. 231. Allied to *Merona*; prosternum with the antecoxal portion distinctly marked off from the supracoxal portion, the latter attenuated behind, its apex projecting downwards as a slender spine; mesosternum constricted behind the front margin; intercoxal process quite short, and truncated behind. Type, *N. centralis*, sp. n., *ibid.* pl. vi. fig. 7, Guatemala, Nicaragua, Panama.

Cilea talia, id. *l. c.* p. 235. Allied to *Falagria*; mesosternum with the hind margin free, not produced backwards in the middle between the coxæ. To include *C. crenata*, Mexico, Guatemala, p. 235, *granigera*, pl. vi. fig. 8, *debilis*, both from Guatemala and Panama, p. 236, and *dubia*, Guatemala, p. 237, spp. nn.

Stenagria, id. *l. c.* p. 237. Allied to *Falagria*; antecoxal portion of the prosternum much larger. To include *S. gracilipes* (type), pl. vi. fig. 9, Mexico to Panama, p. 238, *opacula*, Mexico, *constricta*, p. 239, and *humeralis*, Guatemala, p. 240, spp. nn.; add *Falagria parœ*, Sharp, *ibid.* pl. vi. fig. 10.

Brachychara, Sharp, Biol. Centr. Am. *Col.* i. (2) p. 267. Placed after *Brachida*, but with some affinities to the *Tachyporini*. Types, *B. crassa*, pl. vi. fig. 14, and *brevicornis*, spp. nn., *l. c.* pp. 267 & 268.

Hoplomicra, id. *l. c.* p. 273. Intermediate between *Diestota* and *Gyrophæna*; but with incomplete middle acetabula. Type, *H. clavicornis*, sp. n., *l. c.* p. 274, Guatemala.

Euvira, id. *l. c.* p. 278. Nearest to *Autalia* and *Eudera*; head exserted; neck short and rather narrow; intermediate coxæ small, near together, but not contiguous; the acetabulæ distinct; tibiæ and tarsi slender, fore and mid tarsi 4-jointed, hind tarsi 5-jointed. To include *E. nigra*, Nicaragua, *longula*, Mexico, Guatemala, p. 279, *fuscipes*, *godmani*, pl. vi. fig. [illegible], Guatemala, p. 280, *minuta*, Mexico, Guatemala, and *debilis* and *difficilis*, Guatemala, p. 281, spp. nn.

Gansia, id. *l. c.* p. 282. Allied to *Euvira* and *Autalia*; slender; intermediate coxæ distant; [illegible] distinct; [illegible] not inflexed. Types, *G. bicolor*, pl. vi. fig. 20, and *tibialis*, spp. nn., *l. c.* p. 283, Guatemala.

Tachiona, id. *l. c.* p. 284. An aberrant form of *Bolitocharides*. Type, *T. deplanata*, sp. n., *ibid.*, Mexico.

Bamona, id. *l. c.* p. 287. Allied to *Diglossa* and *Pronomæa*. Trophi ordinary, middle coxæ contiguous. To include *B. concolor*, Panama, *gracilis*, pl. vi. fig. 22, *marginata*, p. 288, *minuta*, *brevicornis*, p. 289, *plebeia*, *parallela*, and *robusta*, Guatemala, p. 290, spp. nn.

Saphoglossa, id. *l. c.* p. 291. Allied to *Pachyglossa*, Fauv., but with widely separated middle coxæ. Type, *S. pictipennis*, sp. n., *ibid.* pl. vi. fig. 23, Guatemala.

Barychara, id. *l. c.* p. 292. Apparently connects *Euryglossa* and *Saphoglossa* with *Oligota*. Type, *B. filicornis*, sp. n., *ibid.* pl. vi. fig. 24, Guatemala.

Mayetia corsica, Corsica, and *atomus*, Sardinia, Saulcy, Bull. Soc. Metz, xv. [1878] p. 118.

Bolitochara eximia, Eppelsheim, Wien. ent. Z. ii. p. 251, Hungary.

Oxysoma oberthueri, Fauvel, Bull. Soc. L. Norm. (3) ii. [1878] p. 155, Algeria, Smyrna.

Ilyobates merkli, Eppelsheim, *l. c.* p. 254, South Hungary.

Aleochara centralis, pl. v. fig. 1, Mexico to Panama, p. 146, *serrulata*, Mexico, Bahia, *pauper*, p. 147, *lacertina*, Mexico, p. 148, *quadrata*, Mexico, *mexicana*, Mexico, Guatemala, p. 149, *oxypodia*, Guatemala, Panama, p. 150, *simulatrix*, Guatemala, *funestior*, Guatemala, Panama, p. 151, *miradoris*, *sallæi*, Mexico, p. 152, *torquata*, Guatemala, Panama, and *angusticeps*, Guatemala, p. 153, Sharp, *l. c.*

Microglossa mexicana, id. *l. c.* p. 157, Mexico.

Polylobus advena, id. *l. c.* p. 158, Panama.

Oxypoda clavigera, Panama, *certata*, p. 159, *championi*, *plebeia*, p. 160, *inepta*, *carinata*, *microps*, fig. 3, p. 161, *palpalis*, fig. 4, pl. v., Guatemala, p. 162, *id.* l. c.; *O. vulnerata* and *magnicollis*, Fauvel, *l. c.* [1878] pp. 144 & 145, Algeria.

Phlœopora fenestrata, Guatemala, p. 164, *glabra*, Guatemala, Panama, *alticola*, pl. v. fig. 5, Guatemala, *sinuata*, Panama, p. 165, *rufipennis*, Guatemala, Panama, *læticula*, p. 166, *furcata*, *crassula*, p. 167, *flavipennis*, *debilis*, *minima*, p. 168, and *rufula*, Guatemala, p. 169, *id. l. c.*

Oealea dejecta, id. *l. c.* p. 169, Guatemala.

Leptusa bodemeyeri, Hungary, and *lederi*, Caucasus, Eppelsheim, *l. c.* p. 252 & note.

Ocyusa crassa, id. *l. c.* p. 302, South Hungary.

Philotermes laxicornis, Sharp, *l. c.* p. 171, pl. v. fig 7, Guatemala.

Homalota pellucida, Algeria, Spain, p. 137, *insignicollis*, Algeria, Corsica, Spain, p. 139, *inermis*, Algeria, Corsica, *opacicollis*, Algeria, Mesopotamia, p. 140, *vulnerata*, p. 144, and *magnicollis*, Algeria, p. 145, Fauvel, *l. c.* [1878] ; *H. consors*, fig. 8, Guatemala, p. 172, *consimilis*, Guatemala, Panama, *dissimilis*, p. 173, *centralis*, *alticola*, p. 174, *libera*, *guatemalæ*, p. 175, *vexata*, *carinata*, p. 176, *pectoralis*, *evanescens*, p. 177, *longifrons*, Guatemala, *diffinis*, Panama, p. 178, *semiobscura*, *spergula*, Guatemala, p. 179, *despecta*, Panama, *colorata*, *heterocera*, Guatemala, p. 180, *cognata*, Guatemala, Nicaragua, p. 181, *leucoptera*, Guatemala, Panama, *perdita*, British Honduras, Guatemala, Nicaragua, p. 182, *sallæi*, Mexico, *termini*, Tr. R., fig. 9, Guatemala, Nicaragua, Panama, p. 183, *chiriquensis*, Panama, *Leca* p. 184, *sobrina*, Guatemala, p. 185, *pumila*, *jugicola*, *montium*, *mundula*, *hirtiventris*, p. 187, *quæsticula*, *thoracica*, p. 188; *flavicauda*, fig. 10, *læticula*, p. 189, *annulata*, Guatemala, *longipennis*, Mexico, p. 190, *mollis*, *discrepans*, Guatemala, p. 191, *basiventris*, Panama, *championi*, fig. 11, Guatemala, p. 192, *godmani*, fig. 12, *ruficentris*, p. 193, *trisignata*, fig. 13, *cingulifera*, p. 194, *prolixa*, fig. 14, pl. v., Guatemala, p. 19[illegible] Sharp, l. c. ; *H. skalitzkii*, Oliviera, Rev. Soc. Porto, iii. p. 14, Portugal; *H.* (*Geostiba*) *chyzeri* and *H.* (*Anopleta*) *excisa*, Croatia, Bohemia, Eppelsheim, *l. c.* pp. 270 & 301.

Sipalia plicatella, Algeria, S. Europe, and *dayensis*, Algeria, Fauvel, *l. c.* [1878] p. 157.

Thamiaræa salvini, pl. v. fig. 16, Panama, p. 197, *cognata* and *variegata*, Guatemala, p. 198, Sharp, *l. c.*

Myrmedonia fauveli, North America, p. 199, *confinis*, *setigera*, Guatemala, p. 200, *brevicollis*, Nicaragua, *diluta*, Mexico, p. 201, *laxicornis*, Guatemala, *fragilis*, Panama, p. 202, *plebeia*, *filicornis*, *homalotoides*, p. 203, *lævior*, fig. 18, p. 204, *docilis*, Guatemala, *pusilla*, Panama, p. 205, *fallax*, Guatemala, *godmani*, fig. 19, p. 206, *breviceps*, *longipes*, fig. 20, p. 207, *teres*, p. 208, and *mimula*, fig. 21, pl. v., Panama, p. 209, *id.* l. c. ; *M. triangulifera*, Fairmaire, C R. ent. Belg. xxvii. p. xli., Philippeville (Algeria) ; *M. mamillata*, *hamulata* and *læviuscula*, Fauvel, *l. c.* pp. 152–[illegible] Algeria.

[illegible]t. ii. [illegible]*bius lativentris*, pl. v. fig. 22, Guatemala, and *similis*, Panama, noticed; [illegible] c. pp. 210 & 211.

Ancyle[illegible]*andria gemina*, fig. 2, Guatemala, p. 219, *digna*, Panama, *brevicollis*, Medd. [illegible]emala, p. 220, *rufa*, fig. 3, pl. vi., *picea*, Panama, p. 221, *flavicans*, [illegible]exico, *vestita*, Guatemala, p. 222, *peltata*, Mexico, *lugubris*, Mexico to [illegible]anama, p. 223, *debilis*, Guatemala, p. 224, *id. l. c.*

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Tachyusa sparsa, Mexico, Guatemala, and *seticornis*, Mexico, Sharp, *l. c.* p. 226.

Gnypeta nigricans, Mexico, Guatemala, *fragilis*, Guatemala, p. 227, and *mexicana*, Mexico, p. 228, *id. l. c.*

Falagria infima (Fauv., MS.), Guatemala, St. Thomas, *nitidula*, p. 233, *inornata*, *quadrata*, Guatemala, p. 234, *id. l. c.*

Epipeda longula, Panama, *minuta*, Guatemala, *minor*, Panama, p. 241, *brevicornis*, *delicatula*, Guatemala, p. 242, *pumila*, Guatemala, Panama, *sordida*, p. 243, *punctiveps*, Guatemala, *debilis*, *longiceps*, Panama, p. 244, *angusticeps*, *discedens*, p. 245, *reyi*, pl. vi. fig. 12, and *linearis*, Guatemala, p. 246, *id. l. c.*

Diestota funesta, Mexico, p. 247, *crassa*, Guatemala, *laticornis*, Mexico to Panama, p. 248, *foveata*, Guatemala, *proxima*, Mexico, p. 249, *brevicornis*, *debilis*, p. 251, *docilis*, *nitens*, and *microps*, Guatemala, p. 251, *lativentris*, Nicaragua, *funebris*, Mexico, p. 252, *convexa*, Guatemala, Panama, p. 253, *id. l. c.*

Gyrophæna oblita, p. 254, *varians*, *fuscipes*, p. 255, *sordidula*, *similis*, p. 256, *apicicornis*, Guatemala, p. 257, *flavipes*, Mexico, *granulata*, Panama, *brevidens*, p. 258, *discoidalis*, Guatemala, p. 259, *pulens*, *humeralis*, Panama, p. 260, *miranda*, Mexico to Panama, p. 261, *chalybæa*, Nicaragua, *convexicollis*, Panama, p. 262, *jansoni*, Nicaragua, *trophiventris*, Panama, p. 263, *gracilicornis*, pl. vi. fig. 13, Guatemala, Panama, *sallæi*, Mexico, p. 264, *occulta*, Guatemala, p. 265, *id. l. c.*

Brachida modesta, Guatemala, Panama, p. 265, *sparsa*, *carinata*, Guatemala, and *geniculata*, Panama, p. 266, *id. l. c.*

Placusa minuta, Panama, *crassidens*, p. 269, *simplex*, Guatemala, *obliquata*, Guatemala, Panama, p. 270, *signata*, *monilicornis*, Guatemala, p. 271, *longicornis*, fig. 15, Panama, *longipes*, p. 272, and *crassula*, fig 16, pl. vi., Guatemala, p. 273, *id. l. c.*

Silusa hirtella, p. 274, *similis*, *vestita*, p. 275, *subtilis*, *maura*, p. 276, *opacella*, fig. 17, *gracilis*, fig. 18, pl. vi. p. 277, *parvula*, p. 278, *id. l. c.*, Guatemala.

Myllæna masoni, Oxfordshire, and *fowleri*, Sherwood Forest, Matthews, Cist. Ent. iii. pp. 38 & 39; *M. mollis*, p. 285, *fragilis*, *debilicornis*, *obtusa*, p. 286, and *robusta*, p. 287, Sharp, *l. c.*, Guatemala.

Dinopsis ferruginea, pl. vi. fig. 25, and *angusta*, id. *l. c.* pp. 294 & 295, Guatemala.

Oligota centralis, *lævipennis*, *polita*, p. 293, and *teres*, p. 294, *id. l. c.*, Guatemala.

Cephaloplectides.

Cephaloplectinæ, subfam. n., Sharp, Biol. Centr. Am. *Col.* i. (2 [illegible]. Differs from the *Tachyporinæ* by the following characters. [illegible] abruptly bent downwards in the middle, mouth placed entirely o[illegible]p. 50, under-surface; antennæ concealed; eyes wanting; prosternum produced behind into a very large process. For *Cephaloplectus*, g. n., *ibid.*; typ[1878] *C. godmani*, sp. n., *l. c.* p. 297, pl. vii. fig. 1, Panama.

Tachyporides.

Rey, C. Tribu des Brévipennes, 2e rameau. Tachyporiens et Trichophyens. Ann. Soc. L. Lyon, xxix. pp. 13–125, pls. i.–iv.

The plates represent details.

Sharp, Biol. Centr. Am. *Col.* i. (2) pp. 299, 305, & 308, pl. vii., notices and figures *Erchomus distans*, Sharp, fig. 3, *ignavus*, Sharp, fig. 7, and *Tachinoderus grandis*, Solsky, fig. 9.

Amblyopinus, Solsky, discussed; it is allied to *Habrocerus* in the *Tachyporini*; but *A. jansoni*, Matth., belongs to a new genus of *Staphylinini* near *Quedius*: Fauvel, Rev. d'Ent. ii. pp. 37–40.

Typhlocyptus, g. n., Saulcy, Bull. Soc. Metz (2) xv. [1878] p. 124. Differs from *Hypocyptus* by want of eyes and great length of maxillary palpi. Type, *T. pandellii*, sp. n., *ibid.*, Corsica.

New species:—

Hypocyptus debilis, Sharp, Biol. Centr. Am. *Col.* i. (2) p. 297, Guatemala.

Cilea fenestrata, id. *l. c.* p. 309, Guatemala.

Tachinus meridionalis, fig. 10, Panama, p. 309, *inornatus*, fig. 11, pl. vii., Tr. R.

Lacy, p. 310, and *nimborum*, Guatemala, p. 311, *id. l. c.*

Erchomus politulus, fig. 2, Mexico to Brazil, p. 298, *debilis*, Guatemala, *strigosus*, Mexico, Guatemala, *tachyporinus*, fig. 4, p. 299, *truncatus*, *glabripennis*, fig. 5, all from Guatemala and Nicaragua, p. 300, *chontalensis*, Nicaragua, *affinis*, *segnis*, Guatemala, p. 301, *dubius*, Guatemala, *sinuatus*, fig. 6, Nicaragua to Venezuela, p. 302, *apicicornis*, *ruficornis* (Dugès, MS.), Mexico, p. 303, *cinctiventris*, p. 304, *vicinus*, Guatemala, *flavipalpis*, Mexico to Panama, p. 305, *ventralis*, Guatemala, *gravidus*, fig. 8, Mexico, Panama, *impressus*, Panama, p. 306, and *mollis*, Guatemala, p. 307, *id. l. c.* pl. vii.

Tachinoderus major, id. *l. c.* p. 308, Panama.

Tachyporus mexicanus, fig. 12, Mexico, p. 311, *pectoralis*, *pallescens*, and *argutus*, fig. 13, pl. vii., Guatemala, p. 312, *id.* l. c.; *T. fascipennis*, Reitter, Rev. mens. Ent. i. p. 72, Elizabethpol, Caucasus.

Bolitobius (*Lordithon*) *dorsalis*, Rey, Ann. Soc. L. Lyon, xxix. p. 50, S. France.

Mycetoporus confinis, id. *l. c.* p. 75, Saint-Germain.

Staphylinides.

Philonthus astutus, Er.: supposed occurrence in Ireland; Fowler, Ent. M. M. xx. p. 168. *P. ventralis* with the third joint of the right hind tarsus furnished with a supplementary 3-jointed tarsus; Fauvel, Rev. d'Ent. ii. pp. 93 & 94. *P. varius*, Gyll., var. *bimaculatus* from Algeria noticed; *id.* Bull Soc. L. Norm. (3) ii. [1878] p. 125.

Ancylophorus wagenschieberi, Kies., noticed from Ladoga; Sahlberg, Medd. Soc. Fenn. ix. p. 128.

Cyrthotorax. Revision of genus: Fauvel, Bull. Soc. L. Norm. (3) ii. [1878] pp. 163–166. He admits 4 species—*C. buphthalmus*, Erichs. (= *cribripennis*, Chevr.), *erythrura*, Kraatz, and 2 new ones.

Myotyphlus, g. n., Fauvel, Rev. d'Ent. ii. p. 40. May be placed between *Quedius* and *Heterothops*. Type, *Amblyopinus jansoni*, Math.

New species :—

Philonthus hesperius and *rufo-cinctus*, Fauvel, Bull. Soc. L. Norm. (3) ii. [1878] pp. 124 & 126, both from Algeria and Spain.

Cyrtothorax vulneratus, Cochin China, and *carnifex*, Cambodia, *id. l. c.* p. 165.

Quedius declivus and *ustus* (= *mauro-rufus*, Luc.), *id. l. c.* p. 128 & 129, Algeria.

Othius xantholinoides, Fairmaire, C.R. ent. Belg. xxvii. p. cviii., Morocco.

Pæderides.

Lathrobium quadratum and *terminatum* are anatomically different ; Weise, Deutsche E. Z. xxvii. p. 333.

New species :—

Lathrobium (*Glyptomerus*) *cæcum*, Frivaldsky, Term. füzetek, vii. [1883] p. 99, Hungary.

Lithocharis ovaliceps, Fauvel, Bull. Soc. L. Norm. (3) ii. [1878] p. 99, Algeria.

Glyptomerus diecki, Saulcy, Bull. Soc. Metz (2) xv. [1878] p. 115, Palermo.

Scotonomus etruscus, id. *l. c.* p. 116, Tuscany.

Pæderus plagiator, Kolbe, B. E. Z. xxvii. p. 18, Chinchoxo.

Œdichirus foveicollis, Quedenfeldt, Wien. ent. Z. ii p. 117, Madagascar.

Stenides.

Stenus speculator, Erichs., = *boops*, Gyll. ; *providus*, Erichs., is distinct from *rogeri*, Kraatz ; and *inæqualis*, Muls. & Rey, is distinct from *cinerascens*, Erichs. ; *exploratus*, Fauv., = *subdepressus*, M. & R. ; *æqualis*, M. & R., may = *morio*, Grav. ; *gracilentus*, Fairm., = *cinerascens*, Erichs. (= *melanarius*, Steph.) ; *exiguus*, Erichs., ? = *pusillus*, Steph., var. ; *opacus*, Erichs., is distinct from *carbonarius*, Gyll. ; *macrocephalus*, Aubé, is distinct from *cautus*, Erichs. ; *aceris*, Steph., is only doubtfully synonymous with *arosus*, Erichs. ; *reitteri*, Weise, is distinct from *scaber*, Grav. ; *flavipalpis*, Thoms., may = *geniculatus*, Grav., var. ; *cavifrons*, M. & R., = *niveus*, Fauv., not *plantaris*, Erichs. ; and *insidiosus*, Solsky, ? = *tarsalis*, Ljungh : Rey, Ann. Soc. L. Lyon, xxix. pp. 146-149.

Evæsthetus fulvus, Motsch., differentiated from *ruficapillus*, Lac. ; Eppelsheim, Wien. ent. Z. ii. pp. 265 & 266.

Stenus brachycerus, Thoms., and *fasciculatus*, Sahlb., noticed ; Sahlberg, Medd. Soc. Fenn. ix. p. 160.

Cylindrogaster sardous, sp. n., Saulcy, Bull. Soc. Metz (2) xv. [1878] p. 122, Sardinia.

Leptotyphlus revelierii, sp. n., *id. l. c.* p. 120, Corsica.

Octavius raymondi, sp. n., *id. l. c.* p. 124, Sardinia.

Stenus excellens, sp. n., Eppelsheim, Wien. ent. Z. ii. p. 303, Dalmatia.

Megalops ornatus, Peru, and *acutangulus*, Java, spp. nn., C. O. Waterhouse, Ann. N. H. (5) xii. pp. 335 & 336.

Oxytelides.

Bledius bedeli, Fauvel, Bull. Soc. L. Norm. (3) ii. [1878] p. 99, Algeria; *B.* (*Pucerus*) *funestus*, Eppelsheim, Wien. ent. Z. ii. p. 271, Turkey: spp. nn.

Thinobius antennarius, sp. n., Fauvel, *l. c.* [1878] p. 261, Texas.

Homaliides.

New genera and species:—

Stachygraphus (Lec., MS.), Horn, Tr. Am. Ent. Soc. x. p 285. Allied to *Geodromicus*. Type, *S. maculatus* (Lec., MS.), sp. n., *ibid.* pl. ix. fig. 7.

Daya, Fauvel, Bull. Soc. L. Norm. (3) ii. [1878] p. 147. Allied to *Aleuonota*. Types, *D. occipitalis* and *seriata*, spp. nn., *l. c.* pp. 148 & 149, Algeria.

Ephelis, id. *l. c.* [1878] p. 219. Allied to *Coryphium*. To include *C. pallida*, *guttata*, and *notata*, Lec.

Tilea, id. *l. c.* [1878] p. 246. Allied to *Lesteva*; palpi, especially maxillary palpi, long and filiform. Type, *T. cavicollis*, sp. n., *ibid.*, British Columbia.

Lathrimæum pictum, id. *l. c.* [1878] p. 233, California.

Amphichroum sparsum, United States, p. 237, *scutatum*, p. 238, *puberulum*, p. 240, and *opaculum*, California, p. 241, *id. l. c.* [1878].

Arpedium cribratum, Michigan, Illinois, *schwarzi*, Ohio, and *angulare*, United States, *id. l. c.* [1878] pp. 224–226.

Homalium cribripenne, Algeria, Caucasus, p. 88, *diffusum*, Lake Superior, p. 207, *megarthroides*, California, p. 208, *hamatum*, Michigan, *humerosum*, p. 209, *punctiventre*, p 210, *fractum*, United States, p. 212, *texanum*, Texas, p. 213, *alutaceum*, California, p. 215, *cribrum*, Southern States, p. 216, and *theveneti*, California, p. 218, *id. l. c.* [1878]; *H. merkli*, Eppelsheim, Wien. ent. Z. ii. p. 305, Balkans.

Anthobium brachiale, Algeria, p. 87, *californicum*, California, p. 199, *convexum*, N. America, *aurifluum*, California, p. 201, and *horni*, Missouri, Georgia, p. 202, Fauvel, *l. c.* [1878].

Protinides.

Protinus sulcatus, sp. n., Fauvel, Bull. Soc. L. Norm. (3) ii. p. 195, California.

Piestides.

Trygæus princeps, Sharp, figured; Waterhouse, Aid. ii. pl. cxxxiii. fig. 3.

Triga, g. n., Fauvel, Bull. Soc. L. Norm. (3) ii. [1878] p. 182. Allied to *Eleusis*. Type, *Hypotelus picipennis*, Lec.

Micropeplides.

Micropeplus marietti, Duval, is distinct from *fulcus*, Erichs., but

margaritæ, Duval, seems to be founded on *marietti* ♂ and *fulvus* ♀; Rey, Ann. Soc. L. Lyon, xxix. pp. 364 & 365.

Micropeplus obsoletus, sp. n.; *id. l. c.* p. 365, Hautes-Pyrénées.

Pselaphidæ.

Reitter, E. Beitrag zur Pselaphiden- und Scydmæniden-Fauna von Java und Borneo. Verh. z.-b. Wien, xxxii. pp. 283–302.

Almost all the species mentioned are described as new.

Schaufuss, L. W. Pselaphinorum spuriorum Monographia. Ann. Mus. Genov. xviii. pp. 166–172.

The author establishes a new section, which he calls, "Pselaphini spurii," and characterizes as follows:—"Tarsi biunguiculati, unguibus pari longitudine, articulis numero inæqualibus. Abdomen segmentis sex supra visibilibus." He refers to it his *Espeson moratus* (genus and species redescribed), *Tamotus femoratus*, and *Tetratarsus plicatulus*, and figures the two first.

——. Pselaphidarum Monographiæ. I. Adranini. II. Clavigerodini. *L. c.* pp. 173–206.

The species are fully described, and the following are figured:—*Artic[illegible] fortnami* (details), *Fustiger amazonicus*, Westw., *F. festivus*, Schauf.

Saulcy, F. de. Species des Paussides, Clavigérides, Pselaphides et Scydménides de l'Europe et des pays circonvoisins (suite). Bull. Soc. Metz (2) xiv. [1876] pp. 25–100.

Includes the genus *Bryaxis* (64 species described, many new), divided into 3 subgenera: *Bryaxis* and *Reichenbachia*, Leach, and *Rybaxis*. The following synonymy occurs:—*B. nigricans*, Gredl., = *fossulata*, Reich.; *rufula*, Rott., = *aubei*, Tourn.; *furcata*, Fairm., = *reichii*, Motsch.; *rubra*, Motsch., = *melina*, Solsk.; *serrata*, Gredl., = *antennata*, Aubé; and *tuberiventris*, Raffr., = *hæmatica*, Reich.

Sharp, D. Revision of the *Pselaphidæ* of Japan. Tr. E. Soc. 1883, pp. 291–331.

The list is raised to 67 species, belonging to 17 genera, 9 of which are peculiar to Japan. The following known species are specially noticed:—*Centrotoma prodiga*, *Stipesa rudis*, *Lasinus spinosus*, *Batrisus modestus*, and *Bythinus japonicus*, Sharp.

Reitter replies to criticisms of Schaufuss relative to various *Pselaphidæ*; Bull. Soc. Ent. Fr. (6) iii. pp. ix., x., & lxxiv.–lxxvi.

Zeotyrus, Sharp, and *Tyrus*, Aubé. Generic characters contrasted; Reitter, Wien. ent. Z. ii. p. 95.

Hamotus. Species tabulated; *id.* Verh. z.-b. Wien, xxxii. pp. 374 & 375.

Jubus, Schauf., *Gamba*, Schauf., and *Arctophysis*, Reitt., are probably synonymous; Raffray, Rev. d'Ent. ii. pp. 244 & 245.

Pselaphus and allied genera tabulated; *id. l. c.* pp. 235 & 236. *P. multangulus*, Schaufuss, noticed by him; Ann. Mus. Genov. xviii. pp. 355 & 356.

Callithorax subtilis, Motsch., noticed; Schaufuss, *l. c.* p. 356.

Epicaris, Reitt., recharacterized; *id. l. c.* p. 370.

Batrisus. Table of Central and South American species; Reitter, *l. c.* pp. 377 & 378. *B.* (*Reichenbachia*) *rufa*, Schmidt, and *B. sphærica*, Motsch., discussed; *id. l. c.* pp. 287 & 291. *B. spinicollis* and *similis*, Sharp (preoccupied), renamed by him *armaticollis* and *affinis*; P. E. Soc. 1883, p. xxix. *B. longipennis*, Raffr., redescribed; Schaufuss, *l. c.* pp 387 & 388.

Machærites. A new species from Normandy discussed and described; Fauvel, Rev. d'Ent. ii. pp. 153-161.

Bryaxis chamæleon, Schauf., should be referred to *Tyrus*; Raffray, *l. c.* p. 238.

Centrophthalmus punctipennis and var. *inæqualis*, Schaufuss, noticed by him; *l. c.* pp. 359 & 360.

Enoptostomus siamensis, Schaufuss, noticed by him; *l. c.* p. 361.

Hybocephalus minimus and *squamosus*, Motsch. Genus and species redescribed; Schaufuss, *l. c.* pp. 353-355.

Bythinus sternbergi, Schmidt, = *nodicornis*, Aubé; *B. montripes* [sic], Reitt., = *œdipus*, Sharp, = *lusitanicus*, Saulcy: Reitter, Deutsche E. Z. xxxii. p. 74.

Tr. R. *Eplectus argus*, Reitter, noticed by him from St. Thomas; *l. c.* p. 43.

Lucaselaphanax setosus, Walk., = *Selina westermanni*, Motsch.; Oberthür, Notes Leyd. Mus. v. pp. 223 & 224.

Articerus odewahni and *bostocki*, Pasc., = *fortnami*, Hope, sexes (?), and *A. ponticus*, Sharp, = *syriacus*, Saulcy; Schaufuss, *l. c.* pp. 183 & 184. *A. stricticornis*, Reitter, referred by him to *Fustiger*; Wien. ent. Z. ii. p. 96.

Clavigerodini, subfam. n., Schaufuss, Ann. Mus. Genov. xviii. p. 205. New section of *Pselaphidæ*, with 3-jointed antennæ; formed for the genus *Clavigerodes*, Raffr.

New genera and species:—

Ephymia, Reitter, Deutsche E. Z. xxvii. p. 34. Allied to *Lasinus* (*Ctenistini*); antennæ hardly clavate, palpi with a small but distinct basal joint; no bifid frontal prominence. Type, *E. simoni*, sp. n., *l. c.* p. 34, St. Thomas and Water Island.

Taphrophorus, Gestro, Ann. Mus. Genov. xviii. p. 350. Allied to *Enoptostomus* and *Tmesiphorus*. Type, *T. doriæ*, sp. n., *l. c.* p. 351, Bogos; add *Tetracis* (?) *ventralis*, Raffr.

Schaufussia, Raffray, Rev d'Ent. ii. p. 238. Allied to *Rytus*, but last joint of maxillary palpi always more or less truncated at tip. Type, *Bryaxis brevis*, Schauf., of which *B. angustior*, Schauf., MS., appears to be the other sex.

Tyromorphus, id. *l. c.* p. 240. Allied to *Hamotus*, *Tyrus*, *Gerallus*, &c. Type, *T. nitidus*, sp. n., *l. c.* p. 241, pl. v. figs. 17 & 18, Australia.

Balega, Reitter, *l. c.* p. 43. Shape of *Sagola* and *Faronus*, but nearer *Gasola*. Type, *B. elegans*, sp. n., *ibid.*, St. Thomas.

Poroderus, Sharp, Tr. E. Soc. 1883, p. 294. Allied to *Ctenistes*. Types *C. armatus*, *medius*, and *similis*, Sharp.

Raphitreus, Sharp, Tr. E. Soc. 1883, p. 298. Allied to *Tmesiphorus*. Type, *T. speratus*, Sharp.

Labomimus, id. *l. c.* p. 300. Allied to *Lasinus*. Type, *L. reitteri*, sp. n., *ibid.*, Japan.

Mentraphus, id. Wien. ent. Z. ii. p. 225. Belongs to Reitter's 2nd group of *Pselaphini*. Type, *M. pselaphodes*, sp. n., *l. c.* p. 226, Mesopotamia.

Berlara, Reitter, Verh. z.-b. Wien, xxxii. p. 286. Intermediate between *Tribatus*, Motsch., and *Berdura*, Reitt.; differs from all the allied genera by the last joint of the palpi, which is large and thick, longer than broad, very irregularly furrowed, with a small notch on the outside, and a large one on the inside, which forms a sharp tooth beneath. Type, *B. crassipalpis*, sp. n., *l. c.* p. 287, Batavia.

Apharina, id. *l. c.* p. 295. Allied to *Mesogaster*; antennæ differently formed, and dorsal and ventral abdominal segments of equal length. Type, *A. simonis*, sp. n., *l. c.* p. 296, Batavia.

Comatopselaphus, Schaufuss, Ann. Mus. Genov. xviii. p. 368. Allied to *Batrisomorpha*; thorax rounded; last joint of the maxillary palpi oii. ovate, stout, with a bristle at the extremity. Type, *C. opacicollis*, sp. n., *l. c.* p. 369, Sarawak.

Triomicrus, Sharp, Tr. E. Soc. 1883, p. 325. Allied to *Tychus* [illegible] *Bryaxis*. To include *B. protervus*, Sharp, and *T. simplex*, sp. n., p. 326, Japan.

Berdura, Reitter, Deutsche E. Z. xxvii. p. 35. Allied to *Bryaxis* (subgenus *Reitenbachia*); abdomen short, abruptly sloping, with very narrow lateral margins. Type, *B. excisula*, sp. n., *l. c.* p. 36, St. Thomas.

Rybaxis [*Ryxabis*, Westw., 1870, also an anagram], Saulcy, Bull. Soc. Metz (2) xiv. pp. 28 & 96. Subgenus of *Bryaxis*. To include *Anthicus sanguinea*, Fabr. (= *nigro-pygialis*, Fairm., *formicariensis*, Gredl., and ? *limnophila*, Peyr.), and *B. gigas*, Baudi (= *doriæ*, Saulcy, MS.).

Acylopselaphus, Raffray, Rev. d'Ent. p. 237. Allied to *Centrophthalmus*, Schmidt; palpi with 4th joint very large, truncated at the extremity, with the inner apical angle furnished with a tuft of hairs; three last joints of antennæ very strongly clubbed, at least in one sex. Type, *A. mariæ*, sp. n., *ibid.* pls. v. fig. 11, & iv. figs. 12–14, Madagascar.

Aplodea, Reitter, *l. c.* p. 47. Allied to *Centrophthalmus*. To include *A. palpalis*, pl. i. figs. 1–3, and *elsbethæ*, spp. nn., *l. c.* p. 48, Valdivia, and *Pselaphus castaneus*, Blanch.

Bythinoplectus, id. *l. c.* p. 37. Allied to *Euplectus*; antennæ 9-jointed, the two basal joints thickened as in *Bythinus*; head as in *Panaphantus*. Type, *B. foveatus*, sp. n., *ibid.*, St. Thomas.

Acotreba, id. *l. c.* p. 52. Differs from *Panaphantus* and *Rhinosceptis* by the long parallel 4-jointed club of the antennæ. Type, *A. simoni*, sp. n., *ibid.* pl. i. figs. 4–6, Valdivia.

Autoplectus, Raffray, *l. c.* p. 248. Allied to *Panaphantus*, Kies. Type, *A. torticornis*, sp. n., *l. c.* p. 249, pl. v. figs. 26–29, Madagascar.

Aphilia, Reitter, Verh. z.-b. Wien, xxxii. p. 297. Allied to *Trimium*; form of *Philus* and *Zebus*; head small; scutellum smooth, unsculptured;

elytra smooth, with only an indistinct sutural stripe. Type, *A. femorata*, sp. n., *ibid.*, Borneo.

Euphalepsus, Reitter, *l. c.* p. 378. Allied to *Phalepsus*, Westw.; maxillary palpi very short and small; abdomen narrowly margined at the sides; [illegible] strongly depressed. To include *E. globipennis*, Mexico, *ovipennis*, p. 379, and *bistriatus*, Brazil, p. 380, spp. nn.

Diartiger, Sharp, *l. c.* p. 329. Allied to *Clavigerodes*. Types, *D. fossulatus* and *spinipes*, spp. nn., *l. c.* pp. 330 & 331, Japan.

Radama, Raffray, *l. c.* p. 230. Allied to *Fustiger*; 2nd joint of antennæ nearly as long as 3rd, but more slender. Types, *R. inflatus*, figs. 3 & 4, and *spinipennis*, figs. 5 & 6, spp. nn., *l. c.* pp. 231 & 232, pl. iv., Madagascar.

Schistodactylus, id. *l. c.* p. 243. An aberrant form of *Pselaphidæ*. Type, *S. phantasma*, sp. n., *l. c.* p. 244, pls. v. figs. 20–22, & iv. fig. 23, King George's Sound.

Acetalius, Sharp, *l. c.* p. 322. Affinities doubtful. Type, *A. dubius*, sp. n., *ibid.*, Japan.

Tmesimia sharpi, Raffray, Rev. d'Ent. ii. p. 233, pl. iv. figs. 7 & 8, Abyssinia.

Bythinistes mimeticus, p. 295, *discedens* and *breviceps*, p. 296, Sharp, Tr. Ent. Soc. 1883, Japan; *C.* (*Sognorus*) *gibbiventris*, Reitter, Verh. z.-b. Ges. Wien, xxxii. p. 283, Batavia.

Tmesiphorus crassicornis and *princeps*, Sharp, *l. c.* p. 299, Japan; *T. umbrosus*, Raffray, *l. c.* p. 234, pl. iv. fig. 9, Burma.

Tyrus japonicus, Sharp, *l. c.* p. 302, Japan.

Hamotus conjunctus, Petropolis, *micans*, Colombia, Venezuela, p. 371, *aubeanus*, Petropolis, *tenuicornis*, *globifer*, p. 372, *auricapillus*, *frontalis*, Venezuela, *subpunctulatus*, Colombia, *transversalis*, Colombia, Venezuela, p. 373, and *inæqualis*, Petropolis, p. 374, Reitter, l. c.; *H. nodicollis*, Raffray, *l. c.* p. 240, Mexico.

Filiger vestitus, id. *l. c.* p. 242, pl. v. fig. 19, Abyssinia.

Jubus schaufussi, p. 245, *longipennis*, Santa Fé de Bogota, *laticollis*, Caracas, p. 246, and *reitteri*, Santa Fé de Bogota, p. 247, *id. l. c.*

Zethopsus dohrni, id. *l. c.* p. 248, pl. v. figs. 24 & 25, "Bimanie."

Sagola microcephala, Reitter, Deutsche E. Z. xxvii. p. 53, pl. i. fig. 7, Valdivia.

Pselaphus gestroi and *breviceps*, Schaufuss, Ann. Mus. Genov. xviii. pp. 356 & 358, Macassar; *P. debilis* and *lewisi*, Sharp, *l. c.* pp. 328 & 329, Japan; *P. sulcifrons*, Raffray, *l. c.* p. 236, pl. iv. fig. 10, Abyssinia; *P. pilipalpis*, Reitter, Notes Leyd. Mus. v. p. 9, Sumatra; *P. pilicollis*, *lativentris*, p. 293, and *parvipalpis*, p. 294, *id.* Verh. z.-b. Wien, xxxii., Batavia.

Batrisus celebensis, Macassar, p. 373, *gestroi*, New Guinea, p. 374, *indus*, p. 375, *septemdentatus*, Sarawak, p. 376, *margaritifer*, p. 377, *grouvellii*, Sumatra, p. 378, *grypochirus*, p. 379, *sarawakensis*, *angulipes*, Sarawak, p. 381, *physoderes*, Sumatra, p. 383, *nephriticus*, Macassar, p. 384, *achillii*, Java, p. 386, *holosericeus*, Sumatra, p. 387, *morus*, Macassar, p. 388, *gantongensis*, p. 389, *beccarii*, Amboina, p. 390, *semisulcatus*, Java,

p. 391, *incertus*, Sarawak, p. 392, *nicotianus*, *superbus*, Sumatra, p. 393, *birmanus*, Burma, p. 394, *similis*, *proportionis*, Sumatra, p. 395, *brevis*, Sarawak, *basalis*, Sumatra, p. 396, and *hatamensis*, New Guinea, p. 3[illegible], Schaufuss, l. c.; *B. euplectiformis*, p. 303, *spinicollis*, *longicornis*, p. 3[illegible] *punctipennis*, p. 305, *palpalis*, p. 306, *acuminatus*, *vestitus*, p. 307, *cavic*[illegible] p. 308, *oscillator*, p. 309, *politus*, *concolor*, p. 310, *fissifrons*, p. 311; *E. cornis*, p. 312, *rugicollis*, *ornatifrons*, p. 313, *solitarius*, p. 314; *aus*, St. p. 315, *punctipennis*, p. [illegible] *similis* and [illegible], St. Thomas, Water Island, Porto Rico, p. 44, *dominus*, St. Thomas, *E.* (*Napochus*) *amœnus*, p. 45, *E.* (*N.*) *tantillus*, St. Thomas, Porto Rico, and *E. atomus*, St. Thomas, p. 46, *id.* Deutsche E. Z. xxvii.

Neuraphes coronatus, Sahlberg, Medd. Soc. Fenn. ix. p. 96, Finland.

Silphidæ.

Silpha americana, Linn., figs. 3, 3*a–d*, and *Necrophorus tomentosus*, Web., figs. 1, 1*a–c*. Larvæ described and figured, with details; Schaupp, Bull. Brooklyn Soc. v. pp. 2 & 18, pl. i.

Nodinus leuco-fasciatus, Lewis, figured; Waterhouse, Aid, ii. pl. cxxx fig. 4.

Necrophorus nigricornis, Fald. Range; Reitter, Deutsche E. Z. x[illegible] p. 60.

Triarthron cedonulli, Schauf., = *lecontii*, Horn; Horn, Tr. Am. [illegible] Soc. x. p. 284, and Reitter, Wien. ent. Z. ii. p. 95. *T. markeli*, Sch[illegible], noticed from Ladoga; Sahlberg, Medd. Soc. Fenn. ix. p. 125.

Dietta, Sharp. Anomalous structure of the type; Horn, *l. c.* p. 285.

New genera and species:—

Idiocheila, Frivaldszky, Term. füzetek, vi. p. 135, pl. ii. figs. 1–3, details. Allied to *Necrophilus* and *Nodinus*. Type, *I. spinipennis*, sp. n., *l. c.* p. 137, pl. i. fig. 4, Borneo.

Ansibaris, Reitter, Rev. mens. Ent. i. p. 111. Allied to *Agathidium*. Type, *A. alexiiformis*, sp. n., *l. c.* p. 112, Caucasus.

Bathyscia doderi, Genoa, and *spagnolii*, Italy, Fairmaire, Ann. Mus. Genov. xviii. pp. 445 & 446; *B. merkli*, Frivaldsky, Term. füzetek, vii. p. 12, Hungary; *B. fausti*, Reitter, Rev. mens. Ent. i. p. 72, Samara.

Ptoma[*to*]*phagus creticus*, Von Heyden, Deutsche E. Z. xxvii. p. 368, Crete.

Catopomorphus weissii, id. *l. c.* p. 73, Elisabethpol, Caucasus.

Triarthron pennsylvanicum, Horn, Tr. Am. Ent. Soc. x. p. 284, Pennsylvania.

Anisotoma hydrobioides, Fairmaire, C.R. ent. Belg. xxvii. p. cxi., Algeria.

Trichopterygidæ.

Note on the *Trichopterygidæ* of Finland; Sahlberg, Medd. Soc. Fenn. ix. pp. 148–150.

Ptenidium gressneri, Erichs., noticed as new to Britain; Blatch, Ent. M. M. xx. p. 121.

Trichopteryx invisibilis, Matth. (= *Acratrichis elongatula*, Motsch.),

Zethopsus nitidulus, Reitter, *l. c.* p. 382, Ceylon.

Dalmodes batrisoides, Brazil, and *rybaxides*, Mexico, *id. l. c.* pp. 382 & 383.

Arctophysis gigantea, id. *l. c.* p. 384, Colombia.

Duciola tetratoma, id. *l. c.* p. 384, Colombia, Venezuela.

11-jo... *trophthalmus femoralis*, id. *l. c.* p. 284, Batavia; *C. præcipuus*, posed of ...ss. *l. c.* p. 350 Macassar ..., Brazil.

Actidium fowlerianum, sp. n., Matthews, Cist. Ent. iii. p. . . , mala.

Scaphidiidæ.

Scaphidium pardale, Cast., var. *nigripenne* described; R. Oberthür, Col. Nov. i. p. 11.

Scaphisoma concinnum, Broun, figured; Waterhouse, Aid, ii. pl. cxxxviii. fig. 6.

Scaphidium cyanellum, N. India, p. 5, *exornatum*, Clarence River, Australia, *peraffine*, Colombia, p. 6, *nigro-cinctulum*, Andaman Islands, *patinoi*, Colombia, p. 7, *geniculatum*, Panama, p. 8, *exclamans*, St. Paul, *panthe-* Botl. Rio Negro, p. 9, *fasciato-maculatum*, Ega, p. 10, *cerasinum*, p. 11, ...*ipenne*, Amazons, p. 12, spp. nn., R. Oberthür, Col. Nov. i.

R. ...*ium rufipes*, sp. n., Reitter, Rev. mens. Ent. i. p. 41, Kars.

Luca...rium methani, sp. n., R. Oberthür, Col. Nov. i. p. 12, Iquitos.

Scaphisoma quadratum, Transvaal, p. 13, *apicirubrum*, *distinguendum*, Abyssinia, *philippinense*, Philippines, p. 14, *luteipes*, Matachin, *jocosum*, St. George's Sound, p. 15, spp. nn., *id. l. c.*

Toxidium reitteri, sp. n., *id. l. c.* p. 16, Abyssinia.

Histeridæ.

List of 7 *Histeridæ* (1 new) collected by Von Mechow in the Quango district; Schmidt, B. E. Z xxvii. pp. 147 & 148.

Crypturus argiolus, Rossi, noticed; De Stefani, Nat. Sicil. ii. pp. 280–282.

Saprinus interruptus, Payk., discussed; Krautz, Deutsche E. Z. xxvii. pp. 354 & 355.

Teretriosoma facetum, Lewis, is from Ceylon, not Canada; Horn, Tr. Am. Ent. Soc. x. p. 286.

Myrmidius swarming in rice from S. America; Riley, Am. Nat. xvii. p. 1071.

New species:—

Platysoma incisipyge, Marseul, Bull. Soc. Ent. Fr. (6) iii. pl. lxvii., Nice.

Hister mechowi, Schmidt, B. E. Z. xxvii. p. 147, Quango; *H.* (*Phelister*) *gentilis*, Horn, Tr. Am. Ent. Soc. x. p. 285, Arizona.

Hetærius comosellus, Fairmaire, C.R. ent. Belg. xxvii. p. xlii., Philippeville (Algeria); *H. lewisi*, Morea, and *grandis*, Talysch, Reitter, Wien. ent. Z. ii. p. 143.

Eretmotes talyschensis, id. *l. c.*, Talysch.

except the 2nd being very small and indistinct; antennæ gradually thickened towards the tip, and elytra with no furrow at the base. Type, *P. integricolle*, sp. n., Reitter, *ibid.*, Venezuela.

Euconnus (*Napochus*) *longipilis*, *E. batavianus*, Batavia, p. 299, *globiceps*, Borneo, *dolosus*, Batavia, *tetratoma*, Borneo, p. 300, *falsatus*, *crassiceps*, Bat[illegible]312, *trichrous*, Borneo, p. 301, *simulator*, *fallax*, Batavia, a[illegible] *E.* (*Euster*[illegible] *punctricollis*, [illegible]inosa, Borneo, p. 302, Reitter, l. c.; *E. felix*, St. Thom[illegible] and [illegible], St. Thomas, Water Island, Porto Rico, p. [illegible], *dominus*, St. Thomas, *E.* (*Napochus*) *amœnus*, p. 45, *E.* (*N.*) *tantillus*, St. Thomas, Porto Rico, and *E. atomus*, St. Thomas, p. 46, *id.* Deutsche E. Z. xxvii.

Neuraphes coronatus, Sahlberg, Medd. Soc. Fenn. ix. p. 96, Finland.

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Nodinus leuco-fasciatus, Lewis, figured; Waterhouse, Aid, ii. pl. cxxx fig. 4.

Necrophorus nigricornis, Fald. Range; Reitter, Deutsche E. Z. x[illegible] p. 60.

Triarthron cedonulli, Schauf., = *lecontii*, Horn; Horn, Tr. Am[illegible] Soc. x. p. 284, and Reitter, Wien. ent. Z. ii. p. 95. *T. märkeli*, Sch[illegible], noticed from Ladoga; Sahlberg, Medd. Soc. Fenn. ix. p. 125.

Dietta, Sharp. Anomalous structure of the type; Horn, *l. c.* p. 285.

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Ptoma[*to*]*phagus creticus*, Von Heyden, Deutsche E. Z. xxvii. p. 368, Crete.

Catopomorphus weissii, id. *l. c.* p. 73, Elisabethpol, Caucasus.

Triarthron pennsylvanicum, Horn, Tr. Am. Ent. Soc. x. p. 284, Pennsylvania.

Anisotoma hydrobioides, Fairmaire, C.R. ent. Belg. xxvii. p. cxi., Algeria.

Trichopterygidæ.

Note on the *Trichopterygidæ* of Finland; Sahlberg, Medd. Soc. Fenn. ix. pp. 148–150.

Ptenidium gressneri, Erichs., noticed as new to Britain; Blatch, Ent. M. M. xx. p. 121.

Trichopteryx invisibilis, Matth. (= *Acratrichis elongatula*, Motsch.),

Lopha to *Throscidium*; it is an insect of wide distribution: Matthews, pp. 5, Ent. iii. p. 45.

and *Actidium*. The 8 known species discussed; *id. l. c.* pp. 46–48.

sp. *Mycophagus*, g. n., Friedenreich, S. E. Z. xliv. p. 379. Antennæ short, 11-jointed, clavate, club 2-jointed; hind coxæ laminate, abdomen composed of seven segments, interungular seta absent. Type, *M. biclavatus*, sp. n., *l. c.* p. 380, Santa Catharina, Brazil.

Actidium fowlerianum, sp. n., Matthews, Cist. Ent. iii. p. 47, Guatemala.

Scaphidiidæ.

Scaphidium pardale, Cast., var. *nigripenne* described; R. Oberthür, Col. Nov. i. p. 11.

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Both Rio Negro, p. 9, *fasciato-maculatum*, Ega, p. 10, *cerasinum*, p. 11, *ampripenne*, Amazons, p. 12, spp. nn., R. Oberthür, Col. Nov. i.

Tr. R. S. *ium rufipes*, sp. n., Reitter, Rev. mens. Ent. i. p. 41, Kars.

Lucar rium mathani, sp. n., R. Oberthür, Col. Nov. i. p. 12, Iquitos.

Scaphisoma quadratum, Transvaal, p. 13, *apicirubrum*, *distinguendum*, Abyssinia, *philippinense*, Philippines, p. 14, *luteipes*, Matachin, *jocosum*, St. George's Sound, p. 15, spp. nn., *id. l. c.*

Toxidium reitteri, sp. n., *id. l. c.* p. 16, Abyssinia.

Histeridæ.

List of 7 *Histeridæ* (1 new) collected by Von Mechow in the Quango district; Schmidt, B. E. Z xxvii. pp. 147 & 148.

Crypturus argiolus, Rossi, noticed; De Stefani, Nat. Sicil. ii. pp. 280–282.

Saprinus interruptus, Payk., discussed; Krautz, Deutsche E. Z. xxvii. pp. 354 & 355.

Teretriosoma facetum, Lewis, is from Ceylon, not Canada; Horn, Tr. Am. Ent. Soc. x. p. 286.

Myrmidius swarming in rice from S. America; Riley, Am. Nat. xvii. p. 1071.

New species:—

Platysoma incisipyge, Marseul, Bull. Soc. Ent. Fr. (6) iii. pl. lxvii.

Nic*eodori*

an. *mechowi*, Schmidt, B. E. Z. xxvii. p. 147, Quango; *H.* (*Pheli*

Eurytrachelus Horn, Tr. Am. Ent. Soc. x. p. 285, Arizona. iii.

pilosi *ius comosellus*, Fairmaire, C.R. ent. Belg. xxvii. p. xlii., P. Ent. Vitt. (Algeria); *H. lewisi*, Morea, and *grandis*, Talysch, Reitt. ent. Z. ii. p. 143. *Læmo-*

Eretmotes talyschensis, id. *l. c.*, Talysch. Aid, ii.

gradually

Echinodes decipiens, Horn, Tr. Am. Ent. Soc. x. p. 286, Arizona. Type,

Phylloscelis orbicularis, Olliff, Tr. E. Soc. 1883, p. 174, and Waterhouse, Aid, ii. pl. cxxxiv. fig. 6, N.E. Borneo.

Saprinus brunnensis, Fleischer, Wien. ent. Z. ii. p. 179, Brünn; *S. nitididuloides*, Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 3, Mioko (New Britain).

Trypeticus tabacigliscens and *grouvellii*, Marseul, *l. c.* p. lxviii., Nice.

Nitidulidæ.

Nitidula ruficollis, Sol., is an *Olophrum*; the species which Reitter mistook for it, and on which he founded his genus *Catonura*, is renamed by him *C. rufithorax*; *Ostomodes dohrni*, Reitt., = *Grynocharis pilosula*, Crotch, but *Eronyxal agrioides*, Reitt., is quite distinct; *Conotelus distinctus*, Schauf., = *luteicornis*, Erichs.: Reitter, Deutsche E. Z. xxvii. p. 74.

Lioschema nigricolle and *rubro-varium*, Fairm. & Germ., redescribed, and the latter figured; Olliff, Cist. Ent. iii. p. 50, pl. iii. fig. 5.

Rhizophagus puncticollis, Sahlb. (= *vagæ*, Wank.), noticed; Letzner, JB. schles. Ges. lx. pp. 304 & 305.

New species :—

Ithyphenes ustipennis, Fairmaire, Ann. Ent. Belg. xxvii. (2) p. Britain.

Carpophilus ordinatus, Olliff, Tr. E. Soc. 1883, p. 175, N.E. Borneo; *C. assimilis*, id. Ent. xvi. p. 97, Ceram.

Ischana quadricollis, Reitter, Notes Leyd. Mus. v. p. 9, East Java.

Prometopia rhombus (Murray, MS.) (Waterhouse, Aid, ii. pl. cxxxiv. fig. 1), and *catillina*, Olliff, Tr. E. Soc. 1883, pp. 176 & 177, N.E. Borneo.

Lasiodactylus notabilis (Waterhouse, Aid, ii. pl. cxxxii. fig. 5), Ceram, and *stelidotoides* (p. 97, fig.), Gilolo, Ceram, Macassar, Olliff, Ent. xvi. pp. 98 & 99.

Cyllodes ruficeps, Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 90, Abyssinia.

Lioschema germaini, Olliff, Cist. Ent. iii. p. 50, pl. iii. fig. 4, Valdivia.

Ips late-fasciatus, Reitter, Rev. mens. Ent. i. p. 41, Caucasus.

Trogositidæ.

Syntelia histeroides, Lewis, figured; Waterhouse, Aid, ii. pl. cxxxiii. fig. 8.

Peltastica, Mann. Occurrence of the genus in Japan noticed; Horn, Tr. Am. Ent. Soc. x. p. 286.

New genera and species :—

Nachycephala, Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 4. ix. pp. *ma*; head trisinuate in front, not sulcated, prothorax not

Ptenidelytra truncated, and pygidium exposed. Type, *P. termit* M. M. xx. p. 5, New Britain.

Trichondria, Olliff, Cist. Ent. iii. p. 57. Allied to *Alindria*. Type, *P.* p. n., *ibid.* pl. iii. fig. 6, Macas, Ecuador.

Lophocateres, Olliff, Tr. E. Soc. 1883, p. 180 (*cf.* also Cist. Ent. iii. pp. 58 & 59). Allied to *Eronyxa*; elytra with fine but distinct costæ, and antennæ with 4-jointed, gradually-formed club. Type, *L. nanus*, sp. n., *l. c.* p. 181, N.E. Borneo; add *L. pilosus*, sp. n., *id.* Cist. Ent. iii. p. 59, Penang. (*Ostoma yvani*, Allib., probably belongs to this genus; *id. l. c.*)

Narcisa lynceus, Olliff, Tr. E. Soc. 1883, p. 178, and Waterhouse, Aid, ii. pl. cxxxiv. fig. 3, N.E. Borneo.

Ancyrona pryeri, Olliff, Tr. E. Soc. 1883, p. 179, and Waterhouse, Aid, ii. pl. cxxxiv. fig. 4, N.E. Borneo.

Peltastica reitteri, Lewis, Ent. M. M. xx. p. 79, Japan.

Colydiidæ.

Colobicus ampliatus, Fairmaire, redescribed by him; Ann. Soc. Ent. Fr. (6) iii. p. 91.

Aglenus major, Schauf., = *brunneus*, Gyll., var.; Reitter, Wien. ent. Z. ii. p. 95.

Bothrideres parallelus, Gestro, redescribed; Fairmaire, *l. c.* p. 91.

[illegible]osoma [*Deino-*, p. 62, and on plate], g. n., Westwood, Tijdschr. Tr. R. S. vi. p. 61. Allied to *Cicones* and *Hyberis*. Type, *C. rugosum*, sp. [illegible] *Luca c.* p. 62, pl. iii. fig. 1 (and iv. figs. 1–6, details), Borneo.

Bothrideres conjossicollis, sp. n., Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 91, Abyssinia.

Cucujidæ.

Grouvelle, A. Cucujides nouveaux du Musée civique de Gênes. Ann. Mus. Genov. xviii. pp. 275–296, pl. vii.

The following known species are noticed:—*Hectarthrum brevifossum*, Newm., and its varr. *cylindricum*, Smith, and *australicum*, Waterh., *Ancistria retusa*, Fabr., *Ino trepida*, Pasc. (variation), and *Psammœcus serrulatus*, Montr. (fig. 16; redescribed, p. 288).

Silvanus surinamensis and *Lœmophlœus alternans*, Erichs. Enormous numbers in grain; Cook, Bull. U. S. Agric. Ent. ii. p. 32.

Cucujus coccinatus, Lewis. Larva described and figured; Olliff, Cist. Ent. iii. pp. 59 & 60, pl. iii. fig. 7. It is distinct from *C. grouvellii*, Reitt., but *C. davidis*, Grouv., = *imperialis*, Lewis; Oberthür & Lewis, Ent. M. M. xix. pp. 261 & 262.

Lœmophlœus monilis, Fabr. Transformations described and figured; Bellevoye, Bull. Soc. Metz (2) xiv. pp. 183–189.

Cucrodeorpha musæ, Woll., recorded from New Zealand; Dohrn, Stett. iv. pp. 495 & 496.

Eurytrachelus, Reitt., = *Xenoscelis*, Schauf.; Schaufuss, Nunq. Ot. iii. *E. depilis*; *D. depressus*, Reitt., = *X. deplanatus*, Woll.; *id.* Bull. Soc. Ent. Belg. (1879) ii. pp. lxxxiv. & lxxxv.

Platycotylus, g. n., Olliff, Tr. E. Soc. 1883, p. 182. Allied to *Lœmophlœus*. Type, *P. insuitatus*, sp. n., *l. c.* p. 183, and Waterhouse, Aid, ii.

pl. cxxxiv. fig. 8, N.E. Borneo, S. Andamans; add *P. nigripes*, Olliff, sp. n., Cist. Ent. iii. p. 60, Kaioa.

New species :—

Hectarthrum doriæ, Grouvelle, Ann. Mus. Genov. xviii. p. 275, pl. vii. fig. 1, New Guinea.

Ancistria beccarii, id. *l. c.* p. 277, pl. vii. fig. 2, Aru, New Guinea, &c.

Ino marginata, Sumatra, and *macularis*, New Caledonia, *id. l. c.* pp. 278 & 279, pl. vii. figs. 3 & 4.

Inopeplus fasciipennis, Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 4, Duke of York Island; *I. borneensis*, Olliff, Tr. E. Soc. 1883, p. 182, and Waterhouse, Aid, ii. pl. cxxxiv. fig. 2, Borneo.

Typhlocharis batica, Mountains of Cordova, and *diecki*, Caucasus, Ehlers, Deutsche E. Z. xxvii. p. 31.

Læmophlæus insignis, fig. 5, Somerset, N. Australia, p. 279, *lepidus*, fig. 6, Somerset, Sarawak, Singapore, p. 280, *ovalis*, fig. 7, Sarawak, *gestroi*, fig. 8, p. 281, *neglectus*, fig. 9, New Guinea, p. 282, *humeralis*, fig. 10, Salwatty, Aru, New Guinea, p. 283, *subtestaceus*, fig. 11, *subgranulatus*, New Guinea, p. 284, *dorsalis*, fig. 12, Aru, Salwatty, New Guinea, p. 285, *fauveli*, fig. 13, New Caledonia, *beccarii*, fig. 14, Aru, p. [illegible] *parvulus*, fig. 15, Australia, p. 287, Grouvelle, *l. c.* pl. vii.

Psammæcus spinosus, Zanzibar, *piceus*, Ternate, p. 289, *reitteri*, Celebes, *dentatus*, New Guinea, p. 290, *angulatus*, Sumatra, and *biangulatus*, New Guinea, p. 291, *id. l. c.* pl. vii. figs. 17–22; *P. hirsutus*, Olliff, Tr. E. Soc. 1883, p. 183, and Waterhouse, Aid, ii. pl. cxxxiv. fig. 7, N.E. Borneo.

Silvanus orientalis, Celebes, Sumatra, *fairmairii*, Zanzibar, p. 292, *inæqualis*, New Caledonia, p. 293, *albertisi*, New Guinea, and *vitulus*, Celebes, p. 294, Grouvelle, *l. c.* pl. vii. figs. 23–27.

Cathartus rugosus, Grouvelle, *l. c.* p. 295, pl. vii. fig. 28, New Guinea.

Cryptophagidæ.

Cryptophagus elongatus, Luc., probably = *Cathartus advena*, Waltl; *C. curticollis*, Luc., probably = *Triphyllus curticollis*, Fairm., = *Typhæa umbrata*, Baudi, = *T. maculata*, Perris; *C. flavipennis*, Fald., = *dentatus*, Herbst; *C. masuriensis* and *durus*, Reitt., described from Masuri and Algeria, have occurred in Spain: Reitter, Deutsche E. Z. xxvii. p. 75. *C. betæ*, Macq., = ? *Paramecosoma melanocephalum*, Herbst; *id.* Wien. ent. Z. ii. p. 96. *C. lapidarius*, Reitt. (*nec* Fairm.), renamed *montanus*; *C. gracilis*, Reitt., is distinct; *Spaniophænus* (*Cryptophagus*) *amplicollis*, Bris., = *S.* (*C.*) *lapidarius*, Fairm.: Brisout, Bull. Soc. Ent. [illegible] (6) iii. p. vii. [illegible] xxvii.

Paramecosoma balearicum, Schauf., = *Leucohimatium* [illegible], Sturm.; Reitter, Deutsche E. Z. xxvii. p. 75, and Bull. Soc. Wien, [illegible] iii. p. viii.

Atomaria (*Anchicera*) *sternodeoides*, sp. n., Reitter, Rev. mens. Ent. i. p. 113, Elisabethpol, Caucasus.

Ephistemus dilutus, sp. n., *id. l. c.* p. 114, Elisabethpol.

LATHRIDIIDÆ.

Table of French *Lathridiidæ* (Mérophysiaires and Lathridiaires); Tholin, Feuill. Nat. iii. pp. 111–113 & 122–124.

Ammatus. German species discussed; Reitter, Wien. ent. Z. ii. pp. 195–197.

Holoparamecus depressus, Curt., *cingulatus*, Beck, and *H.* (*Calyptobium*) *caularum*, Aubé, noticed as British, and redescribed; Olliff, Ent. xvi. pp. 1–4. *H. tuberculatus*, Motsch., = *caularum*, Aubé; Reitter, Deutsche E. Z. xxvii. p. 75.

Cartodera elegans, Aubé. Range; *id. l. c.* p. 60.

Lathridius angulatus, Mann, and *angusticollis*, Humm., differentiated; Fowler, Ent. M. M. xix. p. 247.

Coninomus, Thoms., discussed, with list of 8 species; Belon, C.R. ent. Belg. xxvii. pp. xcix.–ciii. The following synonymy is given:—*C. constrictus*, Humm. (= *carinatus*, Gyll., *carinulatus*, *incisus*, *monticola*, and *hopii*, Waterh., and *limbatus*, Först.); *C. nodifer*, Westw. (= *antipodum*, White, and *nodulosus*, Motsch.).

Corticaria psammetichus, Motsch., belongs to Australia; Reitter, Deutsche E. Z. xxvii. p. 75.

Tr. R. Soc. S. Austr. vi. p. 173.

Lathridius (*Coninomus*) *dromedarius*, Lucas, Trans. Ent. Soc. 1883, p. xlvi.

MYCETOPHAGIDÆ.

Pleganophorus bispinosus, Hampe, referred to the *Mycetæidæ*, near *Leiestes*; Reitter, Deutsche E. Z. xxvii. p. 27.

Litargus exiguus, sp. n., Olliff, Tr. E. Soc. 1883, p. 184, N.E. Borneo.

THORICTIDÆ.

Sphærophorus. Species destructive to orange trees in S. Australia; Macleay, Tr. R. Soc. S. Austr. vi. p. 173.

DERMESTIDÆ.

JAYNE, H. F. Revision of the *Dermestidæ* of the United States. P. Am. Phil. Soc. xx. pp. 343–377, pls. i.–iv.

Byturus is separated as a distinct subfamily. Of the true *Dermestidæ*, 11 genera are monographed, several new genera and species being described. The plates represent details. Much synonomy is given.

Anthrenus tomentosus (destructive to raspberries). Transformations; Verdopod, Gard. Chron. (2) xx. p. 752, figs. 133 & 134.

Leiestes. Chemicals for keeping them out of collections; Bull. Entomological Soc. vi. p. 24.

Dermestes pilorogoderma defectum, Walk., redescribed, and recorded from Borneo; Olliff, Tr. E. Soc. 1883, p. 185. *T. ornatum*, Say: habits of larva; Hamilton, Canad. Ent. xv. pp. 90 & 91.

Anthrenus. Habits of the species found at Metz; Bellevoye, Bull.

Soc. Metz (2) xv. [1880] pp. 155–160, with figures of antennæ. *A. varius*, Fabr.: habits and times of appearance. *A. musæorum*, Linn. (= *castaneæ*, Mels.), frequents flowers in America, and never attacks collections of insects; Hamilton, *l. c.* pp. 90 & 91. *A. scrophulariæ*, Linn., noticed and transformations figured; Lintner, Rep. Ins. N. Y. 1. pp. 9 & 10.

New genera and species :—

Acolpus, Jayne, P. Am. Phil. Soc. xx. p. 360. Differs from *Trogoderma* by the absence of the antennal fossæ. Type, *A. primus*, sp. n., *l. c.* p. 361, fig. 45, Texas.

Axinocerus, id. *l. c.* p. 367. Allied to *Cryptorrhopalum*, but more broadly oval; clypeus long, retracted; and club of antennæ differently formed. Type, *A. americanus*, sp. n., *l. c.* p. 368, Texas.

Dermestes favarcqui, Goudard, Ann. Soc. L. Lyon, xxix. p. 383, China.

Attagenus horni, figs. 1[illegible], 19, 24, & 25, Pacific States, *perplexus*, Nevada, p. 356, and *varicolor*, figs. 20, 21, 27, & 28, Pacific States, p. 3[illegible]*alis*, Jayne, P. Amer. Phil. Soc. xx. *franu-*

Trogoderma New Guinea, p. figs. 51 &[illegible], and *sternale*, fig. 50, *id. l. c.* pp. *guinea*, & 363, *Westveli*, fig. 13, New Caledonia, Fairmaire, C.R. ent. Belg. [illegible] n. *elvi.*, Biskra, 15, Australia, p. 287, Gr. *tropi*

Ptinus [illegible]ax, Waterhouse, Ann. N. H. (5) xi. p. 61, India. *Hebes.*

Dermestoides oscitans, Olliff, Tr. E. Soc. 1883, p. 185, N. Borneo.

Parnidæ.

Beling describes the transformations of *Pomatinus substriatus*, Müll., *Parnus auriculatas*, Ill., and the pupæ of *Elmis volkmari* and *æneus*, Müll.; Verh. z.-b. Wien, xxxii. pp. 437–442.

Lareynia, Duval, = *Elmis*, Latr.; for *Elmis*, Muls., the name *Latelmis* is proposed: Reitter, Deutsche E. Z. xxvii. p. 75.

Protoparnus, g. n., Sharp, Ent. M. M. xx. p. 26. Allied to *Parnus*; body simply pubescent; eyes small and entirely facetted; antennæ 10-jointed, second joint not articulate; joints four to ten furnished with an elongate process; metasternum short. Type, *P. vestitus*, sp. n., *ibid.*, New Zealand.

Elmis concolor, sp. n., Leconte, Tr. Kansas Ac. vii. [1881] p. 75, Santa Fé.

Lucanidæ.

Albers, G. Beiträge zur Kenntniss exotischer Lucaniden. Deutsche E. Z. xxvii. pp. 221–230.

The following known species are discussed :—*Dorcus brevis*, Sa[illegible] xxvii. scribed); *D. alcides*, Voll., is a *Eurytrachelus*, allied to *E. saiga*, Wien, *cribriceps*, Chevr., and *purpurascens*, Voll.; *Eurytrachelus candezii*, [illegible] and probably *lansbergii*, Gestro, = *curycephalus*, Burm.; *Eurytrachelus concolor*, Blanch., and *ceramensis*, Thoms., = *saiga*, Oliv., but *saiga* of recent authors must take the name of *gypaetus*, Cast.; *Ægus philip-*

pinensis, Deyr., and *Eurycephalus intermedius* (Deyr.), Gestro. 4 new species are also described.

Fuchs, C. Synopsis of the *Lucanidæ* of the United States. Bull. Brooklyn Soc. v. pp. 49–52 & 57–60, plate and woodcuts.

Lewis, G. On the *Lucanidæ* of Japan. Tr. E. Soc. 1883, pp. 333–342.

15 species of *Lucanini* and one of *Passalini* are enumerated, excluding *Lucanus cantori*, Hope, and *Prismognathus dauricus*, Motsch., which are probably not Japanese. General remarks on the *Lucanidæ* are prefixed to the paper. The synonymy is given as follows:—*Lucanus maculifemoratus*, Motsch. (= *sericans*, Voll., and *hopii*, Parry), *Cladognathus inclinatus*, Motsch. (= *mandibularis*, Thoms., and *inflexus*, Har.), *Eurytrachelus platymelus*, Saund. (= *Serrognathus castanicolor*, Motsch.), *Macrodorcus rectus*, Motsch. (= *niponensis*, Voll., *diabolicus*, Thoms., and *rugipennis*, Motsch.), *M. striatipennis*, Motsch. (= *binervis* and *cribellatus*, Motsch., *opacus*, Waterh., and *vanvolxemi*, Lewis), and *Dorcus hopii*, Saund. (= *binodulosus*, Waterh.). *Prismognathus angularis*, Waterh., is figured, pl. xiv. fig. 1.

Lamprima varians, Burm., injurious to trees in Australia; Macleay, Tr. R. Soc. S. Austr. vi. p. 173.

Lucanus cervus. Hermaphrodites noticed; Kraatz & Strübing, Deutsche E. Z. xxvii. pp. 27 & 160.

Preliminary notice of a monograph on the *Odontolabini*; Leuthner, P. Z. S. 1883, pp. 598 & 599.

Odontolabis burmeisteri, Hope, figured; "Episodes in the Life of an Indian Chaplain," p. 32.

Dorcus parallelus, Say. Pupa and anus figured; Bull. Brooklyn Soc. v. p. 18, pl. i. figs. 7*a*, *b*, & 6*b*.

Eurytrachelus thomsoni, Parry, = *ternatensis*, Thoms.; Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 5.

New genera and species:—

Palæognathus (Leuthn., MS.), W[illiam]. Soc. Ent. Fr. (6) iii. p. 191. Allied to *Prismognathus*. Type, *P.* [Leuthner, *l. c.* pp. 191–194, pl. vii. No. ii., Danzig (in amber).

Ægognathus, Leuthner, Tr. E. Soc. 18[83]. Appearance of *Ægus*, but nearest allied to *Lissotes* and *Alcimus*. [Type], *Æ. waterhousii*, sp. n., *ibid.* (figured as *Ægopsis waterhousei*, pl. xxi. fig. 3), Chanchamayo, Peru.

Auxicrepis, Waterhouse, Ann. N. H. (5) xii. p. 387. Allied to *Scortizus*. Type, *A. platyceps*, sp. n., *ibid.*, Chanchamayo.

Macrodorcus montivagus, Lewis, Tr. E. Soc. 1883, p. 337, pl. xiv. fig. 2, Japan.

Eurytrachelus urocephalus, Albers, Deutsche E. Z. xxvii. p. 225, Celebes; *E. pilosipes*, Waterhouse, Tr. E. Soc. 1883, p. 447, pl. xxi. figs. 1 & 2, Solomon Islands.

Ægus nitidicollis, Albers, *l. c.* p. 227, Philippines.

Platycerus delicatulus, Lewis, *l. c.* p. 338, pl. xiv. fig. 3, Japan.

Figulus mento, Albers, *l. c.* p. 226, New Guinea.
Ceruchus lignarius, Lewis, *l. c.* p. 339, pl. xiv. fig. 4, Japan.
Æsalus trogoides, Albers, *l. c.* p. 228, Oaxaca; *Æ. asiaticus*, Lewis, *l. c.* p. 340, pl. xiv. fig. 5, Japan.
Aulacocyclus patalis, id. *l. c.* p. 341, pl. xiv. figs. 6 & 7, Japan.

Scarabæidæ.

Coprides.

Lansberge, J. W. van. Matériaux pour servir à une monographie des *Onthophagus*. S. E. Z. xliv. pp. 161–170.

Includes general characters, lists and tables of species, and descriptions of new ones.

——. Révision des *Onthophagus* de l'Archipel Indo-Néerlandais, avec description des espèces nouvelles. Notes Leyd. Mus. v. pp. 41–82 & 145–149.

88 species are enumerated. The following synonymy is given:—*O. victor*, Sharp (= *hekmeyeri*, Voll., MS.), *wallacii*, Har. (= *ovilis*, Sharp), *tricornis*, Wied. (= *crassus*, Sharp, and *rectinicornis*, Fairm.), *sagittarius*, Fabr. (= *oryx*, Fabr.).

Onthophagus marginalis, Gebl., recorded as new to France; Cha[illegible], Feuill. Nat. iv. p. 22.

Proagoderus, subg. n., Lansberge, Notes Leyd. Mus. v. pp. 14 & 15. New section of *Onthophagus*; base of prothorax with an obtuse projection; front tibiæ of ♂ spiny. Type, *O.* (*P.*) *ritsemæ*, *l. c.* p. 14, Liberia.

New species:—

Canthon pauxillus, Amazons, and *unguicularis*, S. João del Rey, Harold, S. E. Z. xliv. p. 430.

Uroxys pygmæus, id. *l. c.* p. 431, Lower Amazons.

Canthidium parvulum, p. 432, *minimum*, Bahia, *flabellatum*, Ega, p. 433, and *miscellum*, Amazons, p. 434, *id. l. c.*

Cheridium procerum and *oblongum*, id. *l. c.* pp. 431 & 432, Brazil.

Eurysternus cirratus, id. *l. c.* p. 429, Bahia.

Onthophagus liberianus, p. 15, *deplanatus*, Liberia, p. 16, *fraternus*, Saleyer, p. 42, *luzonicus* (Esch., MS.), Java, Sumatra, p. 44, *catenatus*, New Guinea, p. 45, *colffsi*, Sumbava, p. 46, *fusco-punctatus*, Java, Malacca, p. 48, *rectecornutus*, Java, Sumbava, p. 49, *neptunulus*, Flores, p. 50, *pygidialis*, Java, p. 51, *phanæicollis*, p. 52, *luteo-signatus*, Flores, p. 54, *javanus*, Java, p. 55, *mulleri*, Borneo, Banka, p. 56, *blumii*, p. 57, *cribratus*, Java, p. 59, *lævicollis*, Sumatra, p. 61, *pilosus*, p. 62, *aphodioides*, Java, p. 63, *saleyeri*, Saleyer, p. 64, *variolaris*, *rotundicollis*, p. 65, *hirsutulus*, Java, p. 66, *nanus*, Sumatra, Malacca, p. 67, *pullus*, p. 68, *lilliputanus*, Java, p. 69, *pilularius*, Java, p. 70, *deflexicollis*, Siam, Malacca, Sumatra, Java, p. 72, *semigranosus*, Sumbava, Flores, p. 74, *semi-aureus*, Java, Sumatra, p. 75, *accedens*, Java, p. 77, *kraatzeanus*, New Guinea, p. 78, *oblongo-maculatus*, Sumatra, p. 79, *hageni*, p. 80, and *denticollis*, Sumatra, Malacca, p. 81, *ventralis*, Sumatra,

p. 145, *sundanensis*, Java, p. 146, *sumatranus*, Sumatra, p. 147, and *mutabilis*, Java, p. 148, Lansberge, Notes Leyd. Mus. v.; *O. ponticus*, Harold, S. E. Z. xliv. p. 434, Grusia; *O. coproides*, Santa Fé, p. 75, *brevifrons* and *cribricollis*, both from Kansas and Texas, p. 76, Horn, Tr. Kansas Ac. vii. [1881].

Phalops olivaceus, India, p. 164, *candezii*, East Indies, p. 165, *sulcatus*, Senegal, *vac Aus*, Mozambique, p. 166, *barbicornis*, East Africa, p. 167, and *inermis*, Abyssinia, p. 168, Lansberge, S. E. Z. xliv.

Aphodiides.

New species:—

Aphodius granulifrons (referred to *Mendidius*, Har., p. clvii.), Biskra, and *sesquivittatus*, Batna, Fairmaire, C.R. ent. Belg. xxvii. pp. xlii. & xliii.; *A. holubi*, Dohrn, S. E. Z. xliv. p. 107, South Central Africa.

Oxyomus interstitialis, Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 5, Mioko (New Britain).

Saprosites capitalis, Fairmaire, Le Nat. v. p. 238, New Britain.

Rhyssemus calatus, Santa Fé, Wyoming, and *sonatus*, Chicago, Leconte, Tr. Kansas Ac. vii. [1881] p. 77.

Antrisis xanti, Frivaldszky, Term. füzetek, vi. p. 138, Borneo.

Orphnides.

Orphnus hildebrandti, sp. n., Fairmaire, Le Nat. v. p. 365, Madagascar.

Geotrupides.

Geotrupes stercorarius. Habits; Steinworth, JH. Ver. Lüneberg [1878] p. 106.

Pleocoma, Lec. Gerstäcker discusses its affinities at length, and regards it as nearest allied to *Pachypus* and *Elaphocera*. He suspects an error as regards the larva attributed to it by Osten-Sacken; S. E. Z. xliv. pp. 436–450.

Bolboceras rugifer, sp. n., Kolbe, B. E. Z. xxvii. p. 19, Chinchoxo.

Geotrupes subcostatus, sp. n., Fairmaire, C.R. ent. Belg. xxvii. p. cix., Morocco.

Lethrus sulcipennis, *substriatus*, a[illegible] *punctus*, spp. nn., Kraatz, Deutsche E. Z. xxvii. pp. 340–342, Osch.

Acanthocerides.

Acanthocerus (*Sphæromorphus*) *byrrhoides*, Ternate, and *A.* (*S.*) *ignitus*, Sumatra, Borneo, spp. nn., Westwood, Notes Leyd. Mus. v. pp. 1 & 2.

Glaphyrides.

Amphicoma (*Dasydera*) *ursina* and *A.* (*Lichnanthe*) *lupina*, Lec. Habits, &c.; Ricksecker, Schaupp, & Blanchard, Bull. Brooklyn Soc. v. pp. 83 & 90.

Melolonthides.

Diphucephala splendens, Macl. (= *colaspidoides*, Gyll.), destructive to trees in S. Australia; Macleay & Tate, Tr. R. Soc. S. Austr. vi. pp. 172 & 173.

Macrodactylus subspinosus, Fabr., discussed; Lintner, Rep. Ins. N. Y. i. pp. 227–233, fig. 68.

Apogonia, Kirb. List of species described since Gemminger's Catalogue; Gestro, Ann. Mus. Genov. xviii. p. 313.

Leucopholis hypoleuca, Wiedm., noticed; Dohrn, S. E. Z. xliv. p. 108.

Lasiopsis, Er. Characters, species, and allied genera discussed; Kraatz, Deutsche E. Z. xxvii. pp. 153 & 154.

Rhizotrogus ater, Fabr.: enormous swarms of ♂ ♂ near Zabern in Alsace, ♀ ♀, as usual, very rare; Giebeler, Ent. Nachr. ix. pp. 215 & 216. *R. sordescens*, Fairmaire, ♀ described by him; C.R. ent. Belg. xxvii. p. cx.

Polyphylla ragusæ, Kraatz, discussed; Nat. Sicil. ii. pp. 271–274.

Melolontha. Ravages in Oise; Girard, Bull. Soc. Ent. Fr. (6) p. lxxx. *M. vulgaris* dug up from a depth of a metre on Jan. —*O.* Lucas, *tom. cit.* p. vii. Migration, &c.; Westhoff & others, Ent. Nachr. (arp), pp. 70–72, 155, 156, 199, & 200, and JB. westf. Ver. xi. pp. 9–12.

New genera and species:—

Adoretops, Kraatz, Deutsche E. Z. xxvii. p. 151. *Rhizotrogidæ*, but mimicking *Adoretus* in the *Rutelidæ*. Type, *Melolontha pexa*, Zoubk.

Askeptonycha, id. *l. c.* p. 154. Allied to *Rhizotrogus*; antennæ 9-jointed; tips of claws bifid. To include *R. sedakovi*, *intermedia* and *sahlbergi*, Mannerh. (*R. dahurica*, Blanch., = *sahlbergi*).

Hoplia misella (Schauf., MS.), Heyden, Ber. senck. Ges. 1882–83, p. 231, Andalusia, Algeria.

Serica latipes, Kolbe, B. E. Z. xxvii. p. 19, Chinchoxo.

Trochalus rufo-brunneus, *concolor*, p. 19, *semiæneus* and *falkensteini*, p. 20, *id. l. c.*, Chinchoxo.

Diphucephala hirtipennis, *cærulea*, and *latipennis*, Macleay, P. Linn. Soc. N. S. W. viii. p. 415, locality unknown.

Mæchidius luniceps, Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 8, New Britain.

Liparetrus convexiusculus, Macleay, *l. c.* p. 416, locality unknown.

Heteronyx insularis and *brevior* (? = *Rhizotrogus punctatissimus*, Montr.), Fairmaire, *l. c.* p. 8, Duke of York Island.

Apogonia squamulosa, Menado, *flavipes*, p. 314, *viridipennis*, *opaca*, Sarawak, p. 315, and *sericea*, Sarawak, Sumatra, p. 316, Gestro, Ann. Mus. Genov. xviii.; *A. affinis*, Kolbe, *l. c.* p. 20, Chinchoxo. *tricolor*

Encya strigiscutata, Fairmaire, Le Nat. v. p. 364, Madagasca Sahaye.

Lepidiota suspicax, Lansberge, Notes Leyd. Mus. v. p. 18, Nias Sumatra.

Rhizotrogus semivillosus and *psilopus*, Fairmaire, C.R. ent. Belg. Java xvii. pp. cix. & cx., Morocco.

Anoxia semiflava, Kraatz, Deutsche E. Z. xxvii. p. 357, Tekke-Turcomania.

Pachydema obscurata [*-tum*], Fairmaire, S. E. Z. xliv. p. 459, Tripoli.
Elaphocera maltzani, Von Heyden, Deutsche E. Z. xxvii. p. 368, Crete.

Rutelides.

Kraatz, G. Ueber die Arten der Gattung *Anisoplia*. Deutsche E. Z. xxvii. pp. 17–24.

Includes descriptions of 5 new species, and short notes on *A. segetum*, Herbst [= *fruticola*, Er., *incalta*, Er., *velutina*, *straminea*, Brullé, *syriaca*, Burm., *zoubkovi* (Esch.), Kryn., *rufipes*, Motsch., and *rosa*, Zoubk.].

Anomala vitis, var. *cupreo-nitens* from Hungary described; Bau, B. E. Z. xxvii. p. 286.

Plusiotis, Burm. Dohrn (S. E. Z. xliv. pp. 496–500) discusses the following species:—*P. adelaida*, Hope (of which *P. ornatissima*, Sturm, is a variety), *costata*, Blanch., *chrysargyrea*, Sallé, *resplendens*, Bouc., *auripes*, Gray, and *rodriguezi*, Bouc.

New species:—

Rhinohyptia (?) *bilaminifrons*, Ancey, Nat. Sicil. ii. p. 95, Abyssinia.

Anisoplia valida (= *pallidipennis*, Er., *nec* Gyll.), Greece, p. 18, *armeniaca*, Erzurum, p. 19, *morio*, Smyrna, *marginata*, Sicily, p. 20, and *parva*, Sarepta, Baku, Derbent, p. 21, Kraatz, Deutsche E. Z. xxvii.

Anomala guessfeldi, Kolbe, B. E. Z. xxvii. p. 20, Chinchoxo; *A. æneiventris*, Duke of York Island, and *æneo-tincta*, New Britain, Fairmaire, Ann. Ent. Belg. xxvii. (2) pp. 6 & 7; *A.* (*Euchlora*) *purpureiventris*, p. 19, *A.* (*E.*) *citrina*, p. 20, and *A.* (*E.*) *seminigra*, p. 25, Lansberge, Notes Leyd. Mus. v., Nias.

Popilia hexaspila, East Africa, and *ludificans* (Dohrn, MS.), Zambesi, Ancey, Nat. Sicil. ii. p. 96.

Parastasia guttulata and *montrouzieri*, Fairmaire, *l. c.* pp. 9 & 10, Duke of York Island.

Adoretus vittaticollis and *albo-hispidus*, id. Le Nat. v. p. 364, Madagascar.

Bolax incogitatus, Dohrn, S. E. Z. xliv. p. 427, Pebas, Peru.

Dynastides.

Oron[illegible] Fairmaire, preoccupied, renamed by him *Camelonotus*, and [illegible] species redescribed; Ann. Ent. Belg. xxvii. (2) pp. 14–16.

[illegible] n., Broun, N. Z. J. Sci. i. p. 299. An abnormal form of [illegible]

[illegible] type, *P. graniceps*, sp. n., *l. c.* p. 300, New Zealand.

Phonotus semivelutinus, sp. n., Fairmaire, Ann. Ent. Belg. xxvii. p. 12, note, Manilla.

Oxymelopus armicollis, sp. n., *id. l. c.* p. 13, Ternate.

Camelonotus oryctoides, sp. n., *id. l. c.* p. 15, New Hebrides.

Coptognathus curtipennis, sp. n., *id.* S. E. Z. xliv. p. 459, Tripoli.

Oryctes peschueli, sp. n., Kolbe, B. E. Z. xxvii. p. 21, Chinchoxo.

Cetoniides.

GERSTAECKER, A. Uebersicht der von R. Buchholz in West-Afrika gesammelten Melitophilen, nebst Bemerkungen über einige andere afrikanische Formen dieser Gruppe. MT. Vorpomm. xiv. pp. 1–38.

28 species were obtained by Buchholz, several of which were new. Among others, the followng known genera and species are redescribed, or specially noticed :—*Eudicella morgani*, White, *Taurrhina*, Burm., *Colorrhina aurata*, Westw., *Asthenorrhina*, Westw., *A. turneri*, Westw., *Plaesiorrhina recurva*, Fabr., *Stethodesma strachani*, Bainbr., *Glycyphana scalaris*, Gory & Perch., *Pseudinca*, Kraatz.

KRAATZ, G. Synonymische Bemerkungen über Cetoniden. Deutsche E. Z. xxvii. pp. 317–320.

Chiefly based on notes received from Van Lansberge. *Eudicella morgani*, White, is distinct from *gralli*, Westw. ; var. *striata* of the former indicated. *Platynocnemis*, Kraatz, is said by Lansberge to be *Asthenorrhina*, ♀, but does not agree with the insect described and figured by Westwood as *Asthenorrhina*, ♀ ; perhaps there is some error. *Eccoptomia 6-sulcata*, Kraatz, is distinct from *granulata*, Burm. (Lansberge) ; *Melinesthes flavipennis*, Westw., is distinct from *algoensis*, Westw. ; *Pachnoda nana*, Kraatz, appears to be the type-form of which *viridana* (Parry), Blanch., is a variety ; *Lomaptera diaphonia*, Kraatz, and *cinnamomea*, Thoms., differentiated (Lansberge); *Micropœcila bremeri*, Jans., probably = *cincta*, Gory, ♀; and *Dilochrosis duboulayi*, Thoms., = *Schizorrhina ebenina*, Butl., ♀.

——. Ueber das männliche Begattungsglied der sogenannten Goliathiden und der Gattung *Pachnoda*, und seine Verwendbarkeit für deren scharfe specifische Unterscheidung. Verh. Ver. Brünn, xxi. pp. 21–30, pl. i.

The male sexual organs are described and figured in 33 species.

On the importance of the forceps in the classification of *Cetoniidæ* ; Kraatz, Deutsche E. Z. xxvii. p. 27.

Table of French *Cetoniidæ* ; Tholin, Feuill. Nat. iii. pp. 27–29.

Rhomborrhina resplendens, Swartz, and *heros*, Gory & Perch. Distribution ; Ritsema, Tijdschr. Ent. xxvi. p. cxlii.

Pyrrhopoda cyanescens, Kraatz. ♂ described by him ; *l. c.* p. 383.

Pogonotarsus vescoi, Coq., noticed ; Dohrn, S. E. Z. xliv. p. 107.

Eucosma viridula, Kraatz. Variation noticed by him ; *l. c.* p. 387.

Euphoria inda, Linn., discussed ; Lintner, Rep. Ins. N. Y. i. pp. 232–[illegible]*paca*, fig. 69.

Cetonia. Corrections of a recent catalogue of European *Cole*[illegible] Ann. Kraatz, *l. c.* p. 11. *C. submarmorea*, Burm., and allies, discussed ; [illegible], Suma pp. 9–13. *C. speciosa*, Adams, and *speciosissima*, Scop., differe[illegible], Java Schaufuss, Bull. Soc. Ent. Fr. (6) iii. p. liv.

Trichoplus cordicollis, Waterh., redescribed and figured, with de[illegible] ; Westwood, Tijdschr. Ent. xxvi. pp. 66 & 67, pl. iii. figs. 5–7.

Incala, Thoms., discussed ; the 4 described species are probably not truly distinct : Kraatz, *l. c.* pp. 369 & 370.

Valgus discussed, and 6 new species described; Kraatz, *l. c.* pp. 373–379. *V. hemipterus*, Linn., noticed; Fallou, Bull. Soc. Ent. Fr. (6) iii. p. lxii.

New genera and species:—

Ptychodesthes, Kraatz & Van Lansberge, Deutsche E. Z. xxvii. pp. 319 & 391. Allied to *Heterorrhina*; elytra margined, hind tibiæ unidentate, clypeus square. Types, *H. alternata*, Klug, *bicostata*, Schaum, and *gratiosa*, Ancey.

Thaumastopeos, Kraatz, Deutsche E. Z. xxvii. p. 27. Allied to *Ischiopsopha*; forceps indented at the sides. Type, *I. mohnickii*, Thoms.

Rhynchocephala, Fairmaire, Le Nat. v. p. 365. Allied to *Doryscelis*. Type, *R. hildebrandti*, sp. n., *ibid.*, Madagascar.

Anectoma, Gerstaecker, MT. Vorpomm. xiv. p. 21. Allied to *Glycyphana*, *Ganetis*, *Discopeltis*, and *Elaphinis*, but differs from all by the transverse clypeus, the front margin of which is truncated and reflexed. Type, *A. squamipes*, sp. n., *l. c.* p. 22, Camaroons.

Tetrarhabdotis, Kraatz, *l. c.* p. 388. Allied to *Leucocelis*; scutellum comparatively large and slightly convex, as is also the pygidium; elytra nearly smooth, with only four stripes; front tibiæ tridentate. Type, *T. nigra*, sp. n., *l. c.* p. 389, Congo.

Diphrontis, Gerstaecker, *l. c.* p. 26. Intermediate between *Diplognatha*, *Porphyronota*, *Eriulis*, and *Charadronota*. Type, *D. cruenta*, sp. n., *l. c.* p. 27, Camaroons.

Niphetophora, Kraatz, *l. c.* p. 384. Allied to *Porphyronota*. Type, *N. maculipes*, sp. n., *l. c.* p. 385, Transvaal.

Microvalgus. id. *l. c.* p. 374. Allied to *Valgus*; to include small Australian species, with the thorax smooth above, and the scutellum much larger than in *Valgus*. Type, *V. lapeyrousii*, Gory & Perch.; add *V. castaneipennis* and *nigrinus*, Macl.

Asthenorrhina dohrni (= *turneri*, ♂, Dohrn, *nec* Westw.), Monrovia, and *buchholzi*, Camaroons, Gerstaecker, MT. Vorpomm. xiv. pp. 9 & 10.

Rhomborrhina olivacea, O. E. Janson, Cist. Ent. iii. p. 63, North China; *R. gigantea*, Kraatz, Deutsche E. Z. xxvii. p. 380, locality not stated.

Tmesorrhina (*Eccoptocnemis*) *superba*, Gerstaecker, *l. c.* p. 12, Quango.

Heterorrhina dohrni, Van Lansberge, Notes Leyd. Mus. v. p. 20, Nias.

Rhinocœta minor, Kraatz, *l. c.* p. 390, S. Africa.

Plectrone lugubris, O. E. Janson, *l. c.* p. 63, Borneo.

Macronota sannio, id. *l. c.* p. 64, Travancore.

Coptomia hildebrandti, p. 381, *castanescens* and *iridoides*, p. 382, Kraatz, thé[illegible]., Madagascar.

hy[illegible]*nathocera trivialis*, Gerstaecker, *l. c.* p. 25, Malimbe, W. Africa; ynast[illegible]*stieta*, Ancey, Nat. Sicil. ii. p. 95, Usagara.

Mela[illegible]*ohinis simillima*, id. *l. c.* p. 94, Abyssinia.

(2) P[illegible]*copeltis capucina*, Gerstaecker, *l. c.* p. 20, Camaroons.

Pi[illegible]*pianucha pilipennis*, Kraatz, *l. c.* p. 384, Nebraska.

[illegible]*ythyrea biskrensis*, Fairmaire, C.R. ent. Belg. xxvii. p. xliii., Biskra.

Leucoscelis semicuprea, Kraatz. *l. c.* p. 387, Congo.

Cetonia nigro-ænea and *cyanescens*, id. *l. c.* pp. 343 & 344, Osch.

Pseudinea dichroa, Gerstaecker, *l. c.* p. 30, Camaroons.

Charadronota soror, Kraatz, *l. c.* p. 389, Ashanti.

Macroma angolensis, id. *l. c.* p. 380, Angola.

Phonotænia bella, id. *l. c.* p. 385, Guinea.

Eucosma minor, id. *l. c.* p. 386, Ashanti.

Cænochilus sumatranus, pl. iii. fig. 2 (& pl. iv. figs. 7–16, details), p. 62, *obscurus*, pl. iii. fig. 3 (& pl. iv. figs. 17–23, details), Sumatra, p. 64, and *parrianus*, pl. iii. fig. 4 (& pl. iv. figs. 24 & 25, details), Angola, p. 65, Westwood, Tijdschr. Ent. xxvi.; *C. platycerus*, Gerstaecker, *l. c.* p. 35, locality unknown.

Genuchus dimidiatus, id. *l. c.* p 33, Camaroons.

Problerrhinus buchholzi, id. *l. c.* p. 32, Camaroons.

Myoderma ruficollis[*-le*] and *fusca*[*-cum*], Kraatz, *l. c.* pp. 371 & 372, Ashanti.

Valgus quadrimaculatus, Malacca, p. 374, *sellatus*, Malacca, Hongkong, and var. *luzonicus*, Philippines, p. 375, *pyrrhopygus*, p. 376, *niger*, Malacca, p. 377, *pulcher*, Malacca, Celebes, and *pustulipennis*, Ashanti, p. 378, *id.* l. c.; *V. œdipus*, Gerstaecker, *l. c.* p. 36, Camaroons.

Buprestidæ.

Thomson, J. Typi Buprestidorum musæi Thomsoniani. Appendix i. Paris: 1879, 8vo, pp. 87. [Omitted from Zool. Rec. xvi.]

187 species are here described, raising the number of types in the author's collection to 433 species.

The larvæ of the following *Buprestidæ* are noticed as destructive to forest trees in North America (Packard, Rep. U. S. Ent. Comm. iii pp. 251–255):—*Chrysobothris femorata*, Fabr., *Chalcophora virginica*, Drury (?), pl. vi. fig. 1, *Melanophila* sp., pls. vi. fig. 4, xii. fig. 1, *Dicerca divaricata*, Say, pl. vi. fig. 2, and an undetermined species, pl. vi. fig. 5.

Julodis variolaris, Pall., var. *undulata* from Tekke-Turcomania described; Von Heyden, Deutsche E. Z. xxvii. p. 355, and Wien. ent. Z. ii. p. 107. *J. iveni*, Mannerh.: this species, and not *J. olivieri*, Cast., occurs in Crete; Lucas, Bull. Soc. Ent. Fr. (6) iii. p. vii.

Steraspis, Sol. Species tabulated, and several new ones described; Thomson, R. Z. (3) vii. pp. 286–299. 25 species admitted. The following synonymy occurs:—*S. scabra*, Latr., and *principalia*, Dej., = *speciosa*, Klug; *S. zanzibarica*, Thoms., = *cyanipes*, Thoms., var.; *S. triangularis*, Gory, and *opulenta*, Dej., = *scabra*, Fabr.; *S. boyeri*, Sol., = *squamosa*, Sol.; and *S. æruginosa*, Klug, = *brevicornis*, Klug.

Gyascutus, Lec., and *Hippomelas*, Lap. & Gory. Synopsis of N. American species; Horn, Tr. Am. Ent. Soc. x. pp. 287 & 288.

Latipalpis pisana, Rossi, probably feeds on olive; Péragallo, Bull. Soc. Ent. Fr. (6) iii. p. xx.

Capnodis tenebricosa, Herbst, living six weeks without food, Java, almost without air; *id. ibid.*

Melanophila cyanea, Fabr.: transformations described; Xambeu, *L. c.* Soc. L. Lyon, xxix. pp. 126–128. *M. longipes*, Say, troublesome in Canada by its bite; Harrington, Canad. Ent. xv. p. 60.

Anthaxia quadripunctata, Linn., noticed; Rupertsberger & others, Wien. ent. Z. ii. pp. 62, 63, 86, 87, & 280.

Polycesta [wrongly printed *Polyctesis*], Sol., discussed; Abeille de Perrin, Rev. d'Ent. ii. pp. 57-60 & 120.

Chrysobothris and allied genera. Characters discussed; Thomson, Typi Bupr. App. i. p. 50. *C. contigua* and *semisculpta*, Lec., are sexes; *cuprascens* and *excsa*, Lec., structure noticed; *vulcanica* and *californica*, Lec., = *trinervia*, Kirby, ♀ ♀; *cribraria*, Mann., = *femorata* var. *soror*, Lec.: Horn, Tr. Am. Ent. Soc. x. pp. 286 & 287.

Agrilus. Synopsis of French species, with notes on critical species and on food-plants; Baudner, Rev. d'Ent. ii. pp. 17–24. *A. sinuatus*, Oliv.: habits described; it is very injurious to pear-trees; Puton, Rev. d'Ent. ii. pp. 67–69. *A. subauratus*, Gebl., recorded as new to Finland; Sahlberg, Medd. Soc. Faun. ix. p. 173.

New genera and species:—

*Aristosoma** (Laf., MS.), Thomson, Typi Bupr. App. i. p. 24. Allied to *Anthaxia* and *Phænops*. To include *A. suturalis*, Thunb. (= *aurata*, Thunb.), and *A. caffra*, sp. n., *l. c.* p. 25, Caffraria.

*Chalcogenia** (Laf., MS.), *id. l. c.* p. 25. Allied to *Aristosoma*. Type, *Anthaxia cuprea*, Gory.

Notographus (Deyr., MS.), *id. l. c.* p. 26. Allied to *Melanophila* and *Anthaxia*, but shape of *Graphipterus* (*Carabidæ*). Type, *N. sulcipennis* (? Macl., MS.), sp. n., *ibid.*, Gayndah.

Hypocisseis, id. *l. c.* p. 49. Allied to *Cisseis*. Type, *H. laticornis*, (Deyr., MS.), sp. n., *ibid.*, N. Australia.

Sternocera mniszechi (= *maculiventris*, Laf., MS.) and *monguersi* (Dej. Cat.), Thomson, Typi Bupr. App. i. pp. 5 & 6, India.

Julodis frey-gessneri, Meyer-Darcis, C.R. ent. Belg. xxvii. p. xxxix. pl. iv.c., Tekke-Turcomania.

Steraspis lafertæi, *gorii*, and *subbrevicornis*, Thomson, *l. c.* p. 7, Zanzibar; *S. hyena*, Mozambique, *obscura*, Abyssinia, Soudan, Arabia, p. 295, *fulgens* (Gory, MS.), Abyssinia, p. 296, *jackal*, Zambezi, *hypocrita*, Natal, p. 297, and *reptilis*, Zambezi, p. 298, *id.* R. Z. (3) vii.

Philocteanus rutilans, Kerremans, C.R. ent. Belg. xxvii. p. cxxviii., Pulo Nias (= *P. maitlandi*, Lansb.; *id. l. c.* p. cxxxiii.); *P. maitlandi*, Van Lansberge, Notes Leyd. Mus. v. p. 22, Nias.

Gyascutus carolinensis, Horn, Tr. Am. Ent. Soc. x. p. 288, N. Carolina.

Chrysodema costata [*-tum*] (Reiche, MS.), p. 8, *manillarum* (Reiche, MS.), Manilla, *subrevisa* [*-sum*], Timor, and *nicobarica* [*-cum*], Nicobar Islands, p. c[illegible]homson, Typi Bupr. App. i.; *C. swierstræ*, Van Lansberge, *l. c.* [illegible]*ynast*[illegible]ias.

Mela[illegible]*etis novata* (Deyr., MS.), Brazil, *laplatensis*, La Plata, p. 10, (2) p. (Deyr., MS.), *severissima*, Mexico, p. 11, *guatemalensis* (Deyr., *Pixo*[illegible]uatemala, *crassicollis* (Laf., MS.), India, p. 12, and *cambodgiensis* *Step*[illegible], MS.), Siam, p. 13, Thomson, *l. c.*

Ox[illegible]*arigena capnodiformis*, Reitter, Rev. mens. Ent. i. p. 114, Liryk in the Talysch.

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* See E. Saunders, Zool. Rec. viii. p. 271.—Ed.

Cæculus turcomanicus, Kraatz, Deutsche E. Z. xxvii. p. 358, Tekke-Turcomania.

Dicercomorpha argenteo-guttata (Laf., MS.), Manilla, and *viridicollis* (Deyr., MS.), Phi'ippines, Thomson, *l. c.* pp. 13 & 14.

Bubastes inconsistans (Deyr., MS.), Swan River, and *globicollis*, Australia, *id. l. c.* p. 14.

Cinyra maculatissima (Deyr., MS.) and *viridi-punctata* (Deyr., MS.), *id. l. c.* pp. 23 & 24, Cayenne.

Diceropygus australis (Deyr., MS.), *id. l. c.* p. 15, Australia.

Torresita ænea (Deyr., MS.), *id. l. c.* p. 23, Australia.

Dystaxia lecontii, id. *l. c.* p. 6, California.

Melobasis obsoleta (Deyr., MS.), Australia, p. 15, *vittigera*, Adelaide, *costata* (Laf., MS.), Adelaide, Tasmania, *costifera*, Swan River, p. 16, *placida* (Laf., MS.), Melbourne, *prasina* (Laf., MS.), Australia, *suturalis* (Deyr., MS.), Sydney, p. 17, *purpureo-signata* (Laf., MS.), Swan River, *gratiosissima*, Australia (Deyr., MS.), *faceta* (Laf., MS.), Moreton Bay, p. 18, *inflammabilis*, *viridi-obscura* (Deyr., MS.), *obscurella*, Australia, p. 19, *innocua* (Laf., MS.), Swan River, *fulgurans* (Laf., MS.), Tasmania, p. 20, *subfulgurans* (Deyr., MS.), Moreton Bay, *cruentata* (Laf., MS.), p. 21, *aureipennis* (Laf., MS.), Australia, *nobilitata* and *cupreo-vittata* (Laf., MS.), Swan River, &c., p. 22, *id. l. c.*

Melanophila prasinata (Deyr., MS.), *id. l. c.* p. 27, Cayenne.

Anthaxia baconis (Laf., MS.), India, *violaceipennis*, p. 27, and *agriliformis* (Deyr, MS.), Brazil, p. 28, *id.* l. c.; *A. marmottani* and *martini*, Brisout, Rev. d'Ent. ii. pp. 81 & 82, Algeria; *A. pleuralis*, Fairmaire, C.R. ent. Belg. xxvii. p. clvii., Batna.

Anilara (Deyr., characterized) *platessa* and *deyrollii*, Thomson, *l. c.* p. 29, Adelaide.

Dactylozodes ptosimoides, id. *l. c.* p. 29, Brazil.

Stigmodera lateritia (Klug, MS.), *avuncularis*, Australia, p. 30, *armata* (Cast., MS.), Sydney, *margini-cervex*, *julia*, p. 31, *obesissima*, Australia, *triramosa* (Deyr., MS.), Adelaide, p. 32, *lais*, *phryne*, *placida* (Laf., MS.), p. 33, *distinguenda* (Reiche, MS.), Australia, *melbournensis* (Deyr., MS.), Melbourne, p. 34, *alterne-costa* (Deyr., MS.), Australia, *transverse-picta* (Deyr., MS.), Swan River, *neologa*, p. 35, *rostrata* (Deyr., MS.), Australia, *lana*, King George's Sound, p. 36, *brutella* (Deyr., MS.), *graphisura* (Deyr., MS.), Australia, *postica* (Laf., MS.), New South Wales, p. 37, *delta*, Australia, and *acutipennis* (Laf., MS.), Moreton Bay, p. 38, *id. l. c.*

Sphenoptera spectabilis, Kraatz, *l. c.* p. 345, Osch.

Belionota huebneri, Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 16, New Britain.

Colobogaster infra-viridis (Deyr., MS.), Mexico, and *diversicolor* (Deyr., MS.), Cayenne, Thomson, *l. c.* p. 39.

Chrysobothris octo-foveolata (Deyr., MS.), Bahia, *disparicollis*, p. 41, *cribrifrons* (Laf., MS.), Cayenne, *ichthyomorpha* (Deyr., MS.), p. 42, *designata* (Reiche, MS.), Mexico, *cavifrons* (Laf., MS.), Brazil, p. 43, *guyanensis* (Buq., MS.), Guiana, *bellata* (Deyr., MS.), Brazil, p. 44, *nausicaa*, Mexico, *catascopus*, Cayenne, p. 45, *amberbakiana*, Amberbaki, New Guinea, *javana* (Reiche, MS.), Java, p. 46, *subsimilis* (Deyr., MS.),

Moreton Bay, *amplicollis* (Deyr., MS.), Swan River, p. 47, *pampas*, (Deyr., MS.), Brazil, and *inca* (Deyr., MS.), Mexico, p. 48, Thomson, *l. c.*

Cisseis regalis (Laf., MS.), *opima* (Laf., MS.), Australia, *viridicollis*, (Reiche, MS.), Sydney, p. 50, *pustulata* (Laf., MS.), Tasmania, *cuprifera* (Deyr., MS.), *semirugosa* (Deyr., MS.), Sydney, p. 51, *rugiceps* (Laf., MS.), Champion Bay, *atro-violacea* (Laf., MS.), Australia, p. 52, *subcarinifrons* (Deyr., MS.), King George's Sound, *semiscabrosa* (Deyr., MS.), Australia, *uniformis* (Deyr., MS.), Melbourne, p. 53, and *minutissima* (Deyr., MS.), Adelaide, p. 54, *id. l. c.*

Corœbus acutus (Deyr., MS.), Shanghai, and *costatus* (Laf., MS.), Siam, *id. l. c.* p. 54.

Corydon cupreoviride [*-dis*] (Laf., MS.), *id. l. c.* p. 55, Brazil.

Callimicra pinguis (Laf., MS.), Colombia, p. 75, *timialitha* and *scutellata* (Deyr., MS.), Brazil, p. 76, *id. l. c.*

Discoderes multivndatus, Ancey, Nat. Sicil. ii. p. 116, Zanzibar.

Amorphosoma cucullatum (Dej , Cat.), Thomson, *l. c.* p. 56, Brazil.

Sambus dedicatus (= *thomsoni*, Deyr., MS.), Celebes, and *chalcosomus* (Laf., MS.), India, *id. l. c.* p. 55.

Synechocera elongata (Deyr., MS.), *id. l. c.* p. 56, Swan River.

Agrilus raffrayi, Abyssinia, p. 56, *capensis* (Reiche, MS.), Cape, Natal, *dejeani* (= *productus*, Dej , Cat.), Brazil, p. 57, *omocyrius* (= *humeralis*, Reiche, MS.), *sutura-lineatus* (Deyr., MS.), p. 58, *mansuetus* (Laf., MS.), *enervatus* (Deyr., MS.), *immaculicollis* (Laf., MS.), Brazil, p. 59, *ceruleo-depilis* (Deyr., MS.), Cayenne, *scrobicollis* (Laf., MS.), Brazil, p. 60, *carinellus*, Amazons, *goryellus*, *bronzeellus*, p. 61, *cuprescensellus*, *nigerellus* [!], p. 62, *simplicellus*, *albo-vittatus* (Buq., MS.), Brazil, *terminatus* (Buq., MS.), Colombia, p. 63, *plutonicellus*, locality not stated, *citrino latus* (Deyr., MS.), *pacificus* (Laf., MS.), p. 64, *albo-notatus* (Laf., MS.), *6-guttatellus*, *6-flavo-guttatellus*, p. 65, *adustellus*, *immaculatellus*, *pugionellus*, p. 66, *4-guttatellus*, *filosellus*, *violacellus*, p. 67, *profugellus*, *impressipennis* (Laf., MS.), p. 68, *fraudatorellus*, *colluviellus*, *alectorellus*, p. 69, *sicariellus*, Brazil, *irrequietus* (Laf., MS.), Cayenne, *monotonus* (= *gracilis*, Laf.), Brazil, p. 70, *crapulellus*, Colombia, *fosseicollis* (Deyr., MS.), Guatemala, *cyaneo-niger*, Japan, p. 71, *dionides* (= *rugosicollis*, Laf.), *villoso-striatus* (Reiche, MS.), *monogrammus* (Laf., MS.), India, p. 72, *sinensis* (Laf., MS.), Shanghai, *spurcities* (= *pauperculus*, Laf.), Moradabad, India, *flavo-taniatus* (Laf., MS.), p. 73, and *australis* (Deyr., MS.), Australia, p. 74, *id.* l. c.; *A. baudii*, Alps, Trieste, pp. 19 & 23, *proximus*, pp. 19 & 23, and *reyi*, S. France, pp. 21 & 23, Bauduer, Rev. d'Ent. ii.; *A. munieri*, Tebessa, and *sinuatocollis*, Aranjuez, Brisout, *tom. cit.* pp. 82 & 83.

Paragrilus rugatulus (Deyr., MS.), Thomson, *l. c.* p. 74, Mexico.

Aphanisticus æquinoxialis (Laf., MS.), Benguela, and *lilliputanus* (= *ocularis* (Deyr., MS.), New South Wales, *id. l. c.* p. 75.

Trachys commixta (Laf., MS.), Mussuree, p. 76, *orientalis* (Reiche, MS.), Hindostan, *torrida* (Deyr., MS.), Benguela, and *anthrenoides* (Laf., MS.), India, p. 77, *id. l. c.*

Brachys triangularis (Laf., MS.), *id. l. c.* p. 78, Brazil.

Taphrocerus rusticus (Laf., MS.) and *stygicus* (Laf., MS., = *subconicus*, Reiche, MS.), *id. l. c.* p. 78, Brazil.

Lius proximus, *purpurescens*, *cupricollis*, p. 79, *simplex*, *ignifrons*, and *tomentosus* (all Laf., MS.), p. 80, Thomson, *l. c.*, Brazil.

Liopleura dorsalis, id. *l. c.* p. 81, Brazil.

Pachyscelis[*-lus*] *consobrinus*, *pauperulus*, p. 81, *repentinus* and *trifasciatus* (all Laf., MS.), p. 82, *id. l. c.*, Brazil.

Monommatidæ.

Monomma abyssinicum and *antinorii*, Gestro, redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 92.

Monomma subopacum, *atro-nitens*, and *notabile*, id. Le Nat. v. p. 197, and Ann. Soc. Ent. Fr. (6) iii. pp. 92–94, Abyssinia; *M. splendidulum*, id. Notes Leyd. Mus. v. p. 39, Saleyer; *M. auberti*, Gaboon, p. 40, *maximum*, p. 41, *globulosum*, p. 42, *puncticolle*, Zanzibar, p. 43, Oberthür, Col. Nov. i.: spp. nn.

Hyporrhagus mathani, Para, *clavicornis*, Ega, p. 44, *steinheili*, Colombia, p. 45, spp. nn., *id. l. c.*

Eucnemidæ.

Deltometopus ereptus, Bonv., = *amœnicornis*, Say; Horn, Tr. Am. Ent. Soc. x. p. 288.

Phyllocerus herculeanus, Schauf., = *longipennis*, Ferr., var.; Reitter, Wien. ent. Z. ii. p. 96.

Lacon, g. n., Westwood, Tijdschr. Ent. xxvi. p. 67. Allied to *Melasis*. Type, *L. suturalis*, sp. n., *l. c.* p. 68, pl. 4 figs. 8 & 9–13, details, Argentine Republic.

Neocharis cylindrata, sp. n., Broun, N. Z. J. Sci. i. p. 300, New Zealand.

Talerax tenuis, sp. n., *id. l. c.* p. 301, New Zealand.

Elateridæ.

Beling, T. Beitrag zur Metamorphose der Käferfamilie der Elateriden. Deutsche E. Z. xxvii. pp. 129–144 & 257–304.

The transformations of the following 25 species are described at length: *Lacon murinus*, Linn., *Melanotus rufipes*, Herbst, *Agriotes aterrimus*, *lineatus*, and *obscurus*, Linn., *pallidulus*, Ill., *Dolopius marginatus*, Linn., *Sericosomus brunneus*, *Ludius ferrugineus*, Linn., *Corymbites hæmatodes*, Fabr., *æneicollis*, Oliv., *pectinicornis*, Linn., *æruginosus*, Germ., *tessellatus*, Linn., *affinis*, Germ., *holosericeus*, Fabr., *æneus*, Linn., *Campylus rubens*, Pill. & Mitt., *linearis*, Linn., *Athous subfuscus*, Müll., *hæmorrhoidalis*, *vittatus*, Fabr., *longicollis*, Oliv., *niger*, Linn., and *Limonius nigri*[*pes*], Gyll.

Ormerod, [Miss] E. A. Report on Wireworms. J. R. Agri[c. Soc.] (2) xix. pp. 104–143, woodcuts.

Almost exclusively agricultural.

Elater nigricollis, Herbst, *Androchirus fuscipes*, Mels., *Athous cucu[lionis]*, Say, and *Centronopus calcaratus*, Fabr. Larvæ described; Coquillett, Canad. Ent. xv. pp. 101 & 102.

Agræus. List of known species; Candèze, Notes Leyd. Mus. v. p. 205, note.

Chalcolepidius porcatus, Linn. Prothoracic breathing orifices closed by a peculiar trap-door arrangement; Sharp, P. E. Soc. 1883, pp. iii. & iv.

Athous difformis, Lac., an evening insect; Collett, Ent. M. M. xx. pp. 71 & 72. *A. longicollis*, Oliv.: variation in ♀ noticed; Fricken & Brauns, Ent. Nachr. ix. pp. 51, 52, & 225. *A. niger*, Linn., feeding on ergot of rye; Rupertsberger, Wien. ent. Z. ii. p. 63.

Corymbites tristis, Cand. (? = *Elater semivittatus*, Say), noticed from Japan; Horn, Tr. Am. Ent. Soc. x. pp. 288 & 289.

Chrosis violacea, Sharp, = *livens*, Broun; Broun, N. Z. J. Sci. i. p. 301.

Tomicephalus sanguinicollis, Latr., noticed; Dohrn, S. E. Z. xliv. p. 160.

New genera and species :—

Sossor, Candèze, Notes Leyd. Mus. v. p. 208. Allied to *Sephilus*, *Elius*, and *Singhalenus*. Type, *S. hageni*, sp. n., *l. c.* p. 209, Sumatra.

Oxystethus, Fairmaire, Le Nat. v. p. 238. Allied to *Hypsilostethus*; mesosternum and metasternum not separated by a suture, claws simple, coxæ nearly parallel, slightly broader on the inside. Type, *O. scapulatus*, *coxalis ibid.*, New Britain.

Localit[h]recus, id. S. E. Z. xliv. p. 365. Allied to *Hemiops*. Type, *H. hildebrandti*, sp. n., *ibid.*, Madagascar.

Psorochroa, Broun, N. Z. J. Sci. i. p. 301. *Elateridæ*; type, *P. granulata*, sp. n., *l. c.* p. 302, New Zealand.

Agræus ritsemæ, Candèze, Notes Leyd. Mus. v. p. 204, Java.

Alaus engelhardi, Saleyer, and *wallandi*, Sumatra, *id. l. c.* pp. 11 & 207; *A. breviplicatus*, Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 17, Duke of York Island.

Simodactylus fasciolatus, id. Le Nat. v. p. 238, New Britain.

Anchastus serdangensis and *simulans*, Candèze, *l. c.* pp. 209 & 210, Sumatra.

Megapenthes agriot[o]ides, Saleyer, p. 12, *inficetus*, p. 210, and *anceps*, Sumatra, p. 211, *id. l. c.*

Melanoxanthus ruptus, Sumatra, Java, and 10-*maculatus*, Sumatra, *id. l. c.* pp. 211 & 212; *M. tetraspilotus*, Fairmaire, *l. c.* p. 239, New Britain.

Cryptohypnus montanus and *sandageri*, Broun, N. Z. J. i. pp. 302 & 303, New Zealand.

Lomemus rectus and *vittatus*, id. *l. c.* pp. 303 & 304, New Zealand.

Negastrius algidus, Sahlberg, Medd. Soc. Fenn. ix. pp. 98 & 164, Lapland, Siberia.

Chaniophorus velatus and *octo-notatus*, Candèze, B. E. Z. xxvii. p. 21, Ch[a]ris Oxo.

Trachyonus ustulatus and *hasselti*, id. Notes Leyd. Mus. v. pp. 13 & 205, Hindostan.

[S.), *Elius dilaticollis*, Fairmaire, *l. c.* p. 239, New Britain.

Agriotes caspicus, Von Heyden, Deutsche E. Z. xxvii. p. 358, Tekke-Turcomania, Baku.

Agonischius conspurcatus and *elegans*, Candèze, *l. c.* p. 213, Sumatra.

Cebrionidæ.

Analestesa testacea, Leach, = *Cebrio bicolor*, Fabr.; Horn, Tr. Am. Ent. Soc. x. p. 288.

Cebrio elenæ, sp. n., Fairmaire, Ann. Mus. Genov. xviii. p. 446, Tunis.

Rhipidoceridæ.

Schiödte, J. C. De metamorphosi Eleutheratorum observationes. Bidrag til insekternes udviklingshistorie. 11^vte^ Bidrag. Nat. Tids. (3) xiii. pp. 415–426, pl. xviii.

Includes the transformations of *Callirrhipis dejeani*, Latr.

Callirrhipis piceiventris, sp. n., Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 18, Duke of York Island.

Chamærrhipes bifoveolatus, sp. n., Taschenberg, Z. Naturw. lvi. p. 177, Socotra.

Dascyllidæ.

Beling describes the transformations of *Elodes* (*Cyphon*) *coarctatus*, Payk., and *E.* (*Prionocyphon*) *serricornis*, Müll.; Verh. z.-b. W. u. Tr. Am. Ent. pp. 435–437.

Eubria. Structure noticed; Horn & Olliff, Tr. Am. Ent. Soc. x. p. 289.

Pleolobus, Phil., belongs to the *Dascyllidæ* and = *Anorus*, Lec.; Horn, Tr. Am. Ent. Soc. x. p. 289.

New species :—

Cyprobius undulatus, Broun, N. Z. J. Sci. i. p. 367, New Zealand.

Cyphanus mandibularis, id. *ibid.*, New Zealand.

Veronatus antennalis, id. *ibid.*, New Zealand.

Cyphon remotus, *nigro-pictus*, *laticollis*, p. 368, *rectangulus*, *plagiatus*, *propinquus*, p. 369, *acerbus*, *crassus*, *suturalis*, p. 370, *nitidus*, *lateralis*, *molestus*, p. 371, and *dilutus*, p. 372, *id. l. c.*, New Zealand.

Telephoridæ.

Gorham, H. S. Revision of the Genera and Species of Malacoderm *Coleoptera* of the Japanese Fauna. Tr. E. Soc. 1883, pp. 393–411, pl. xvii.

In discussing the characteristics of the Japanese fauna, the writer proposes to class the genera and species of any country into three categories: (1) The generalized, or undifferentiated type; (2) the ordinary type; (3) the specialized, or much modified type. 18 species of *Lycidæ* [illegible] of *Lampyridæ* are noticed.

——. Descriptions of *Malacodermata* in the Civic Museum of Natural History at Genoa. Ann. Mus. Genov. xviii. pp. 591–606.

Relates chiefly to Abyssinian species, and includes unimportant notes on several previously described.

Lycides.

Bourgeois, J. Monographie des *Lycides* de l'ancien monde (suite et fin). L'Ab. xx. pp. 97–122.

——. *Lycides* nouveaux ou peu connus du Musée Civique de Gènes. 3me mémoire. Ann. Mus. Genov. xviii. pp. 621–648.

The most important notes on known species are as follows:—*Macrolycus bowringi*, Waterh., ♂ described; *Calochromus melanurus*, Waterh., redescribed; *Lycostomus similis*, Hope (= *triangularis*, Hope, *geminus*, Walk., *cinnabarinus*, Cand., and *coccineus*, Motsch.); *Lycus constrictus*, Fähr. (= *cuspidatus*, Klug, *æolus*, Murr., and ? *melanurus*, Waterh.); *L. præmorsus*, Dalm. (= *latissimus*, Fabr., *nec* Linn., Oliv.; text only, *fabricii*, Guér., and var. *harpaga*, Thoms.); *Lopholycus bremii*, Guér., and *raffrayi*, Bourg., variation, and *L. olivieri*, Bourg., ♀ described; *Chlamidolycus trabeatus*, Guér., varr. tabulated; *Microlycus dentipes*, Dalm. (= *bremii*, Fähr.); *Lycus foliaceus*, Dalm. (= *senegalensis*, Cast.); *Haplolycus congener*, Gerst., redescribed; *Ditoneces rufo-brunneus*, Gorh., *Bulerides obsoletus*, Waterh., ♂ ♂ described, *indus*, Kirsch, redescribed; *Cantires excellens*, Waterh., variation in antennæ noticed; *Xylobanus retipictus*, Gorh., redescribed; *Metriorrhynchus kirschi*, Waterh. (= *coxalisterus lineatus*, Kirsch), *sericeus*, Waterh., variation noticed, *astutus*, locality recorded; *Trichalus anceps*, Waterh., variety noticed, *communis*, Walk., redescribed; *Libnetis pumilio*, Waterh., ♂ described.

The following known *Lycidæ* are noticed by Gorham (Tr. E. Soc. 1883, pp. 397–408, pl. xvii.):—*Lycus modestus*, Kies. (*nec* Waterh.), *Macrolycus pectinifer*, Kies. (= *pectinicornis*, Kraatz, and ? *flabellata*, Motsch.), figs. 1 & 2, *Metriorrhynchus geometricus*, Kies. (= *Cœnia bourgeoisi*, Har.), *Eros spinicoxis*, Kies., *Platycis nasutus*, Kies, *Lyponia quadricollis*, Kies. (= *Eros militans*, Kies.), figs. 5 & 6, *delicatulus*, Kies., *Plateros coracinus* and *P.* (?) *nothus*, Kies.

Lycus divided into 9 characterized subgenera; Bourgeois, Bull. Soc. Ent. Fr. (6) iii. pp. lix.–lxii.

Calopteron reticulatum, Fabr. Notes on pupa; Moffat, Canad. Ent. xv. pp. 179 & 180.

New genera and species:—

Acantholycus, Bourgeois, Bull. Soc. Ent. Fr. (6) iii. p. lix. Subgenus of *Lycus*; like the following described in the same paper. Type, *L. præmorsus*, Dalm.

Hololycus, id. *ibid.* Type, *H. intermedius*, Bourg., MS., from Natal.

Lopholycus, id. *ibid.* Type, *L. raffrayi*, Bourg.

Chlamydohaus, id. *l. c.* p. lx. Types, *L. trabeatus* and *elevatus*, Guér.

Microlycaris (*l. c.* p. lxi. Types, *L. rostratus*, Linn., and *humerosus*, Fähr.

Neolycus, Indostan *ibid.* Type, *L. schœnherri*, Chevr.

Thoracs.), *Jn* (Dugès, MS.), *id. ibid.* Type, *L. adumbratus*, Bourg.

Haplolycus, id. *l. c.* p. lxii. Types, *L. congener*, Gerst., *melanurus*, Blanch. (*Lycostomus*, Motsch.), and *semiustus*, Chevr.

Planeteros, Gorham, Ann. Mus. Genov. xviii. p 591. To include

African species allied to *Plateros*. Type, *P. ochropterus*, sp. n., *ibid.*, Abyssinia.

Mesolycus, Gorham, Tr. E. Soc. 1883, p. 398. Allied to *Macrolycus*. Type, *M. puniceus*, sp. n., *l. c.* p. 399, pl. xvii. figs. 3, 3 *a* & *b*, Japan.

Pristolycus, id. *l. c.* p. 407. A doubtful form of *Lycidæ*, approaching the *Lampyridæ*. Type, *P. sagulatus*, sp. n., *ibid.* pl. xvii. fig. 8, Japan.

Lycus seminiger, Kolbe, B. E. Z. xxvii. p. 21, Chinchoxo.

Calochromus darjeelinensis, Darjeeling, and *sericeus*, Sarawak, Bourgeois, Ann. Mus. Genov. xviii. pp. 622 & 623; *C. distinguendus*, Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 21, Duke of York Island.

Lycostomus gestroi, Sarawak, p. 624, *patruelis*, Darjeeling, p. 625, and *waterhousii*, Sarawak, p. 626, Bourgeois, *l. c.*

Cladophorus ochraceicollis, Fairmaire, *l. c.* p. 22, Duke of York Island.

Eros erythropterus, pl. xvii. fig. 7, p. 400, *oculatus*, p. 401, and *relatus*, p. 402, Gorham, Tr. E. Soc. 1883, Japan.

Conderis orientis and *pictus*, pl. xvii. fig. 4, *id. l. c.* pp. 403 & 404, Japan.

Plateros purpurivestis and *P.* (?) *lineatus*, id. *l. c.* p. 406, Japan; *P.* (*Entodaphus*) *africanus*, Bourgeois, Bull. Soc. Ent. Fr. (6) iii. p. x[illegible] and Ann. Mus. Genov. xviii p. 633, Shoa.

Dihammatus beccarii, Bourgeois, Ann. Mus. Genov. xvii[illegible]. 634.

Melampyrus pulchellus, id. *l. c.* p. 635, West Java.

Bulenides cognatus, p. 637, *pauperulus*, Sarawak, p. 638, and *javanicus*, Java, p. 639, *id. l. c.*

Xylobanus elongatus, Java, p. 640, *vetulus*, Sarawak, p. 641, and *frater*, Java, p. 642, *id. l. c.*

Lygistopterus anorachilus, Ragusa, Nat. Sicil. ii. p. 251, Sicily.

Metriorrhynchus antinorii, Bourgeois, *l. c.* p. 644, Shoa.

Trichalus fuliginosus, Sarawak, and *longicollis*, Manilla, *id. l. c.* p. 646.

Libnetis sejunctus, id. *l. c.* p. 648, Java.

Lampyrides.

Gorham, Tr. E. Soc. 1883, pp. 409 & 410, notices *Lucidota* (?) *discicollis*, Kies., *Luciola picticollis*, Kies. (= *cruciata*, Har., *nec* Motsch.), *vitticollis*, *parvula*, Kies., and *gorhami*, Rits. (= *affinis*, Gorh., *nec* Rits., and *præusta*, Kies., *nec* Esch.), from Japan; *L. lateralis*, Motsch., is doubtful as a Japanese species.

Abstract of Wielowiejski's "Studien über Lampyriden" [*cf.* Zool. Rec. xix. *Ins.* p. 78]; Emery, Biol. Centr. iii. pp. 69–72 (*cf.* also Nature xxvii. p. 231).

Lampyris turkestanica, Heyd., redescribed; Olivier, Rev. d'[illegible]te, [illegible]t. ii. pp. 332 & 333.

Lamprorrhiza mulsanti, Kies., noticed and larva described; R[illegible], p. [illegible] Soc. L. Lyon, xxix. pp. 143–145. *L. splendidula*, Linn., noticed [illegible] p. 49 man, Nature, xxviii. p. 243.

Phosphænus hemipterus. Habits and luminosity; Jenner, Ent. [illegible]i. p. 216.

Luciola affinis, Gorh. (*nec* Rits.), renamed *gorhami*; Ritsema, Notes

Leyd. Mus. v. p. 4. *L. australis*, Fabr.: larva described; Olivier, *l. c.* pp. 331 & 332. *L. discoidea*, Gorh. (= *gratiosa*, Dej. Cat.), = *discicollis*, Cast.; *id. l. c.* p. 80, note.

Lucidina, g. n., Gorham, Tr. E. Soc. 1883, p. 408. Allied to *Lucidota*. To include *L. biplagiata*, Motsch. (= *L. vulnerata* and *augusticollis*, and ? *tabida*, Kies.), and *L. accensa*, sp. n., *ibid.* pl. xvii. figs. 9 & 9*a–c*, Japan.

New species :—

Lamprocera brunnea, Olivier, Rev. d'Ent. ii. p. 326, Amazons.
Vesta urens, Gorham, Notes Leyd. Mus. v. p. 3, Borneo, Sumatra.
Lucidota (?) *fumosa*, id. Tr. E. Soc. 1883, p. 409, Japan.
Alecton indicus (Chevr., MS.), Olivier, *l. c.* p. 327, Bengal.
Pyrocœlia pectoralis, id. *l. c.* p. 328, N. China.
Lampyris soyauxi, Kolbe, B. E. Z. xxvii. p. 22, Chinchoxo; *L. nervosa* (Reitt., MS.), Olivier, Bull. Soc. Ent. Fr. (6) iii. p. lxix., Syria.
Pelania angustipennis, id. *ibid.*, Algeria.
Luciola semimarginata, Celebes, p. 73, *insignis*, p. 74, *biguttata*, Zanzibar, *semilimbata*, East Indies, p. 75, *venusta*, Java, *timida*, Saigon, p. 76, *neglecta*, Java, p. 77, *zanzibarica*, Zanzibar, p. 78, *lata*, Borneo, p. 79, *coxalis*, Abyssinia, p. 80, *insularis*, Andaman Islands, p. 328, *rubiginosa*, locality unknown, p. 329, *anceyi*, China, and *terminalis*, Saigon, p. 330, *cf.* Rev. d'Ent. ii.; *L. quadripunctata* and *pallida*, Kolbe, *l. c.* p. 22, Chinchoxo; *L. laticollis*, Gorham, Notes Leyd. Mus. v. p. 4, Java.

Telephorides.

Telephorus crassicornis, Sol., = *denticornis*, Blanch. (? = *angulatus*, Gyll.); *Trypherus argentinus*, Steinh., is a *Malthinus*: C. Berg, An. Soc. Arg. xvi. p. 269.

Silidius, g. n., Gorham, Ann. Mus. Genov. xviii. p. 595. Type, *S. æthiopicus*, sp. n., *ibid.*, Abyssinia.

New species :—

Telephorus saleyeri, Gorham, Notes Leyd. Mus. v. p. 251, Saleyer; *T.* (?) *basicornis*, Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 20, Duke of York Island.
Rhagonycha consociata, Von Heyden, Deutsche E. Z. xxvii. p. 311, Mount Olympus (Asia Minor).
Silis scioensis, p. 593, *fossulatus* and *beccarii*, p. 594, Gorham, Ann. Mus. Genov. xviii, Abyssinia.
Ichthyurus hageni, Ritsema, Notes Leyd. Mus. v. p. 248, East Sumatra.
Malthinus pallicolor, Fairmaire, C.R. ent. Belg. xxvii. p. cxii., Algeria; *M. pyrrhoderus* and *obscuricollis*, id. Bull. Soc. Ent. Fr. (6) iii. p. xxxiv., Bulgaria.

Drilides.

Drilus flavescens, Rossi. Habits; Bertkau, CB. Verh. Ver. Rheinl. xl. pp. 96 & 97.
Diplocladon, g. n., Gorham, Notes Leyd. Mus. v. p. 5. *Drilidæ*, but

having the appearance of some of the *Lampyridæ*. Type, *D. hasselti*, sp. n., *l. c.* p. 6, Sumatra.

Haplocladon, g. n., Gorham, *l. c.* p. 249. Section of *Diplocladon*, with the antennæ simply pectinated; founded on a possibly dimorphic form of *Pristolus* [illegible] *D. hasselti*, Gorh., from Sumatra and Java.

Drilus ramosus, sp. n., Fairmaire, Le Nat. v. p. 205, and Ann. Soc. Ent. Fr. (6) iii. p. 94, Abyssinia.

Selasia fulva, sp. n., Gorham, Ann. Mus. Genov. xviii. p. 596, Bogos.

Melyrides.

Abeille de Perrin, E. Nouveau supplement à l'histoire des Malachides. Rev. d'Ent. ii. pp. 25–37 & 49–57.

Includes remarks on larvæ, descriptions of new ones, and a list of species described since Peyron's Monograph (*cf.* also Dokhtouroff, *op. cit.* p. 96). *Malachius dissimilis*, Baudi, *bellieri*, Peyr., *calabrus*, Baudi (differentiated from *parilis*, Er.), *geniculatus*, Er., *vittatus*, Mén., *gethsemaniensis*, Ab. (♀ described), and *Attalus sicanus*, Er., are specially noticed.

Ebæus humilis, Er., *nec* Peyr., discussed; *id. l. c.* pp. 33 & 34. n. Ent.

New genera and species:—

Arthracanthus, Broun, N. Z. J. Sci. i. p. 372. Allied to *Dasytes*. Type, *A. planifrons*, sp. n., *ibid.*, New Zealand.

Halyles, id. *l. c.* p. 373. Allied to *Dasytes*. Types, *H. nigrescens*, *brevicornis*, and *semidilutus*, spp. nn., *ibid.*, New Zealand.

Hapalochrus spectabilis, Ancey, Nat. Sicil. ii. p. 116, Uzagara; *H. tibialis*, Kolbe, B. E. Z. xxvii. p. 22, Chinchoxo.

Laius raffrayi, Gorham, Ann. Mus. Genov. xviii. p. 597, Abyssinia.

Malachius sponsus, Cyprus, p. 25, *sculptifrons*, p. 27, *crux*, Syria, p. 28, *flavicrus*, Caspian, p. 30, and *hæres*, Morea, p. 31, Abeille de Perrin, Rev. d'Ent. ii.

Attalus thalassinus, id. *l. c.* p. 31, Austria; *A. limbipennis*, Gorham, *l. c.* p. 598, Abyssinia.

Hedybius lividus, id. *ibid.*, Abyssinia.

Ebæus adolescens (= *humilis*, Peyr., *nec* Er.) and *pygialis*, Abeille de Perrin, *l. c.* p. 34, Biskra.

Troglops cyrtosoides and *albo-zonatus*, id. *l. c.* pp. 35 & 36, Cyprus.

Carphurus rubricentris, Duke of York Island, and *serricornis*, Mioko (New Britain), Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 21.

Henicopus physomerus, id. C.R. ent. Belg. xxvii. p. cxii., Algeria.

Dasytes constrictus and *occipitalis*, Broun, N. Z. J. Sci. i. p. 373, New Zealand.

Pristoscelis comatus, Leconte, Tr. Kansas Ac. vii. [1881] p. 77, Santa Fè.

Dasytiscus hebraicus, Bourgeois, Bull. Soc. Ent. Fr. (6) iii. p. viii., Jerusalem.

Melyris atripilosus and *conicicollis*, Gorham, *l. c.* pp. 600 & 601, Abyssinia.

CLERIDÆ.

Gorham, Biol. Centr. Am. *Col.* iii. (2) pp. 169–193, figures or specially notices *Hydnocera nitidicollis*, Chevr., fig. 9, *cincta*, Spin., fig. 8, *bituberculata*, Chevr., *Ichnea mexicana*, Thoms., figs. 18, 19, & 21, *religiosa*, Chevr., fig. 20, *disjuncta*, Gorh., figs. 23 & 24, *enoplioides*, Spin. (= *circumcincta*, Chevr.), fig. 22, *aterrima*, Klug, *Apolopha trilineata*, Chevr., *Platynoptera mexicana*, Thoms., fig. 11, *Pyticera militaris*, Chevr. (= *Enoplium humerale*, Horn), *Orthopleura damicornis*, Fabr. (= *bimaculata*, Mels., *punctatissima* and *pennsylvanicum*, Chevr., and *thoracicum*, Say), *suturalis*, Chevr., *ichneoides*, Chevr., *Chariessa vestita*, Chevr., *Pelonium amœnum*, Spin. (= *fasciculatum*, Spin.), *amabile*, Spin , fig. 15, *crinitum*, Klug (= *collare*, Spin.), *quadrisignatum*, Spin., *bilineicolle*, Chevr., fig. 12, *Lebasicella pallipes*, Klug, fig. 25, pl. ix.

Hemibrachys bizonatus, *Pelonium ruficolle*, *badehi*, and *extraneum*, *Ichnea vitella*, *Omadius abscissus*, *vespiformis*, and *Paratillus basalis*, Gorham, figured; Waterhouse, Aid, ii. pls. cxxvi. figs. 1–7, & cxxix. fig. 2.

Cymatodera gigantea, Horn, = *hopii*, Gray; Horn, Tr. Am. Ent. Soc. x. p. 289.

Cierus rufipes, Brahm. Transformations described; Xambeu, Ann. Soc. L. Lyon, xxix. pp. 128 & 129.

Tenerus, Cast. Additions to Gemminger's Catalogue; Gestro, Ann. Mus. Genov. xviii. p. 317.

Brachyclerus, g. n., Fairmaire, C.R. ent. Belg. xxvii. p. clvii. A very aberrant form of *Cleridæ*. Type, *A. bonnairii*, sp. n., *ibid.*, Biskra.

New species :—

Philocalus pretiosus, Gorham, Ann. Mus. Genov. xviii. p. 601, Abyssinia.

Tillus speciosus, id. *l. c.* p. 603, Abyssinia.

Gyponyx abyssinicus, id. *l. c.* p. 604, Abyssinia.

Trichodes spectabilis, Kraatz, Deutsche E. Z. xxvii. p. 346, Osch.

Hydnocera subulata, fig. 4, Guatemala, Panama, *testacea*, Mexico to Panama, *lateralis*, p. 169, *scapularis*, Panama, *subvittata*, Guatemala, Panama, *chalybeata*, Mexico, Guatemala, p. 170, *pulchella*, Panama, Guatemala, *trichroa*, fig. 5, Guatemala, p. 171, *hæmatica*, *clavata*, Mexico, *obscura*, Guatemala, Panama, p. 172, *sordida*, Mexico, *corticina*, fig. 6, Mexico, Guatemala, p. 173, *intricata*, Guatemala, *nigro-ænea*, Mexico, p. 174, *cyanipennis*, *cryptocerina*, Guatemala, p. 175, *impressa*, fig. 7, Panama, p. 176, Gorham, Biol. Centr. Am. *Col.* iii. (2) pl. ix.

Esolemidia subviridis, id. *l. c.* p. 177, Panama.

Tenerus marginipennis, Gestro, Ann. Mus. Genov. xviii. p. 316, Burma.

Ichnea histrica, fig. 1, p. 178, *panamensis*, fig. 2, pl. x., Panama, p. 179, *dugesi*, Mexico, p. 181, Gorham, *l. c.*

Apolopha chiriquiana and *linearis*, id. *l. c.* p. 182, Panama.

Pyticera championi, id. *l. c.* p. 184, pl. ix. fig. 10, Guatemala.

Orthopleura binotata, Mexico, Guatemala, p. 185, *purpurea*, pl. ix. fig. 17, Guatemala, and *teneroides*, Panama, p. 186, Gorham, *l. c.*

Pelonium notabile, p. 188, *percomptum*, Panama, *metallescens*, fig. 16, Guatemala, p. 189, *inscriptum*, *octo-notatum*, fig. 13, Panama, *lineolatum*, fig. 14, pl. ix., Guatemala, p. 191, *id. l. c.*

Laricobius sahlbergi, Reitter, Rev. mens. Ent. i. p. 42, Arctic Siberia.

Lebasiella bisbinotata, Gorham, *l. c.* p. 192, pl. ix. fig. 26, Honduras; *L. discoidea*, Leconte, Tr. Kansas Ac. vii. p. 77, Santa Fé.

Callimerus ornatus, Gorham, Notes Leyd. Mus. iv. p. 110, Sumatra; *C. rusticus*, id. *op. cit.* v. p. 252, Celebes, Saugir.

Phymatophæa ignea, Broun, N. Z. J. Sci. i. p. 375, New Zealand.

Cupesidæ.

Cupes clathratus, Solsky, figured; Waterhouse, Aid. ii. pl. cxxxiii. fig. 7.

Ptinidæ.

Gorham, Biol. Centr. Am. iii. (2) pp. 196–202, figures or specially notices *Ptinus brunneus*, Duftschm., *Niptus ventriculus*, Lec., *Trichodesma imperator*, Cast., pl. x. fig. 9, *Anobium paniceum*, Linn. (= *obesum*, Melsh., and *tenuistriatum*, Say).

Ptinus latro, Fabr., with malformation of the left front femur; Von Fricken, Ent. Nachr. ix. p. 44. *P. pulverulentus*, Raffray, recorded from Aden; Ancey, Nat. Sicil. ii. p. 117, note.

Niptus hololeucus, Fald. The rudiments of wings in larva and pupa described, with special reference to apterous *Coleoptera*; Dewitz, Zool. Anz. vi. pp. 315 & 318, and Ann. N. H. (5) xii. pp. 108–111. Occurrence at Greiz; Ludwig, SB. nat. Fr. 1883, pp. 48 & 49.

Mezium, Curt. Fauvel discusses and redescribes *M. sulcatum*, Fabr. (= *hirticolle*, Cast., *cristatum*, Boh., and *gibbicolle*, Rey), *americanum*, Cast. (= *arachnoides*, Desbr., *bicolor*, Dej., Cat., and ? *sulcicolle*, Brullé), and *affine*, Boield.; Rev. d'Ent. ii. pp. 306–309 (figs. of front of thorax).

Sitodrepa (*Anobium*) *panicea*, Linn. Habits noticed; Hamilton, Canad. Ent. xv. pp. 92 & 93. *Arthrolytus puncticollis*, Möll., is parasitic upon it; Möller, Ent. Tidskr. iv. pp. 104 & 223.

Xestobium rufo-villosum, Deg. (= *Anobium tessellatum*, Fabr.), noticed as injurious to pine; Letzner, JB. schles. Ges. lx. pp. 302–304.

Ernobius angusticollis, Muls., *nec* Ratz., must take the name of *mulsanti*, Kies., which has priority over *anabaptista*, Des Gozis; Puton, Rev. d'Ent. ii. p. 72.

New genera and species:—

Pitnus, Gorham, Biol. Centr. Am. *Col.* iii. (2) p. 197. Allied to *Niptus*; antennæ 9-jointed, the last joint claviform; elytra deeply punctate; tarsi 5-jointed. Type, *P. pygmæus*, sp. n., p. 198, pl. x. fig. 8, Guatemala.

Micranobium, id. *l. c.* p. 202. Allied to *Anobium*: second ventral

segment of the abdomen as long as the three apical segments. Types, *H. exiguum* and *pulicarium*, pl. x. fig 14, spp. nn., Guatemala.

Lioolius, Gorham, *l. c.* p. 203. Allied to *Thaptor*, but with the short form and black or blue-black colour of *Dorcatoma*. To include *L. punctatus*, pl. x. fig. 15, Honduras, Panama, *glaber*, Guatemala, p. 203, *striatus*, Nicaragua, *pubescens*, Guatemala, Panama, p. 204, and *ovulum*, Nicaragua, Panama, p. 205, spp. nn.

Thaptor, id. *l. c.* p. 205. *Dorcatomini*; club 3-jointed, the two last joints contiguous. To include *T. pupatus*, fig. 11, Mexico, Guatemala, &c., *throscoides*, fig. 12, pl. x., British Honduras, Guatemala, and *oblongus*, Mexico, p. 206.

Heptaphylla, Friedenreich, S. E. Z. xliv. p. 375. (*Anobiidæ*, see p. 501.) Tarsi 4-jointed; front coxæ separated by the prosternal process; antennæ 14-jointed, 7-foliate; left mandible bifid at the tip. Type, *H. fungicola*, sp. n., *l. c.* p. 377, Santa Catharina, Brazil.

Ptinus æthiopicus, Ancey, Nat. Sicil. ii. p. 117, Abyssinia; *P. latefasciatus*, fig. 5, Mexico to Panama, *albipunctum*, Panama, p. 194, *coarctatus*, Mexico, Guatemala, *lateralis*, fig. 6, pl. x., Guatemala, p. 195, Gorham, Biol. Centr. Am. *Col.* iii. (2).

Trigonogenius niveus, id. *l. c.* p. 197, pl. x. figs. 3 & 4, Guatemala, Panama.

Trichodesma albina, fig. 10, p. 199, *w-album*, *albistolata*, fig. 7, pl. x. p. 200, *plumbea*, p. 201, *id. l. c.*, Guatemala.

Xyletinus strigillatus, Ancey, *l. c.* p. 117, Abyssinia.

Dorcatoma tomentosa, fig. 16, Guatemala, p. 208, *quadrimaculata*, fig. 17, pl. x., Guatemala, Panama, *contracta*, Guatemala, p. 209, Gorham, *l. c.*

Cathorama herbarium (Chevr., MS.), Mexico, Nicaragua, Panama, and *seminulum*, pl. x. fig. 13, Guatemala, Nicaragua, *id. l. c.* p. 207

Bostrychidæ.

Gorham, Biol. Centr. Am. *Col.* iii. (2) pp. 210–218, pl. x., figures or specially notices *Polycaon exesus*, Lec. (probably = *Apate femoralis* and *gonagra*, Fabr.), figs. 18 & 19, *plicatus*, Lec. (= *obliquus*, Lec.); *Apate punctipennis*, Lec.; *Xylopertha sericans*, Lec. (= *asperum*, Lec.), fig. 21; *Dinoderus pusillus*, Fabr., *substriatus*, Payk.; and *Tetrapriocera longicornis*, Oliv. (= *swartzi*, Horn), fig. 20.

New species:—

Apate (*Ligniperda*) *lignicolor*, *A.* (*Xylopertha*) *forficula*, and *A.* (*Bostrychus*) *insignita*, Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 95, Abyssinia; *A.* (*B.*) *tetraodon*, id. Le Nat. v. p. 205, and Ann. Soc. Ent. Fr. (6) iii. p. 96, Abyssinia.

Bostrychus verrucosus, Gorham, Biol. Centr. Am. *Col.* iii. (2) p. 214, pl. x. fig. 22, Guatemala.

Sinoxylon championi, id. *ibid.*, Guatemala.

Xylopertha tubularis, Panama, and *scapularis*, Mexico to Panama, *id. l. c.* p. 216.

Cioidæ.

Gorham, Biol. Centr. Am. *Col.* iii. (2) pp. 219-224, pl. x., specially notices or figures *Macrocis taurus*, Reitt., fig. 25, *Cis bubalus*, *bilimeki*, Reitt., *creberrimus* and *punctatus*, and *Ceracis militaris*, Mell. (= *furcifer*, Mell.), fig. 26.

Lyctus planicollis, Le Conte. Transformations described and figured; E. Dugès, Ann. Ent. Belg. xxvii. (1) pp. 54–59, pl. i.

New species :—

Lyctus prostomoides, Guatemala, Panama, and *griseus*, Guatemala, Gorham, Biol. Centr. Am. *Col.* iii. (2) p. 212.

Cis corticinus, Guatemala, *fasciatus*, fig. 23, Mexico, Guatemala, p. 220, *bisbidens*, fig. 24, pl. x., Mexico, p. 221, *pilosus*, Guatemala, p. 222, *id.* l. c.; *C. recurvatus*, p. 375, *picicollis* and *viridiflavus*, p. 376, Broun, N. Z. J. Sci. i., New Zealand.

Macrocis setifer, Gorham, *l. c.* p. 220, Guatemala.

Ceracis tricornis, id. *l. c.* p. 224, pl. x. fig. 27, Mexico, Guatemala.

Tenebrionidæ.

Allard, Ann. Soc. Ent. Belg. xxvii. (1) pp. 14–53, discusses the following genera of *Heteromera* :—*Trientoma*, Sol. (6 species admitted); *Gnathosia*, Fisch. (11 species admitted: *G. depressicornis*, Fald., = *carceli*, Sol.; *G. variabilis*, Sol., and *lævigata*, Dej., = *nasuta*, Ménétr.); *Anatolica*, Esch. (14 species admitted: *A. elongata*, Gebl., *subquadrata*, Sol., and *conica*, Motsch., = *angustata*, Serv.; *A. acutangula*, Fald., and *gibbicollis*, Mann, = *angulosa*, Gebl.; *A. tristis*, Sol., = *lata*, Sol.; *A. angusticollis*, Gebl., and *tenebricosa*, Fald., = *constricta*, Stev.; *A. implana*, *propinqua*, Fald., and *torulosa*, Fisch., = *undulata*, Gebl.); *Halonomus*, Woll. (4 species admitted); *Trigonoscelis*, Sol. (11 species admitted: *T. contraria*, Desbr., = *nodosa*, Sol.; *T. sinuaticollis*, Desbr., = *echinata*, Fisch.; *T. serrata*, Fisch., and *Pimelia perevostchicovi*, Zoubk., = *T. deplanata*, Sol.; and *T. scabriuscula*, Dej., = *affinis*, Ménétr.); *Ocnera*, Fisch. (18 species admitted: *O. piceola*, Desbr., = *grisescens*, Fairm.; *O. muricata*, Gemm., *nec* Fisch., = *menetriesi*, Kraatz; *O. perlata*, Baudi, = *robusta*, Faust; *O. elliptica*, All., olim, = ? *granulata*, Fisch.; *O. gomorrhana*, Reiche, and *græca*, Desbr., = *philistina*, Reiche; *O. beckeri*, Desbr., = *setosa*, Fald.; and *O. longicollis*, Baudi, = *christophi*, Faust.).

Additions to the list of Danish *Heteromera*; Schiödte, Nat. Tids. (3) xiii. p. 474.

Notes on various Sicilian *Heteromera*, with descriptions of 2 new species; Baudi, Nat. Sicil. iii. pp. 1–7.

Zophosides.

Zophosis alborana, sp. n., Baudi, Ann. Mus. Genov. xviii. p. 760, fig., Island of Alboran (Mediterranean).

Erodiides.

Spyrathus fabrii, sp. n., Fairmaire, Bull. Soc. Ent. Fr. (6) iii. p. lv., India.

Arthrodeis plicatulus, sp. n., *id.* Ann. Soc. Ent. Fr. (6) iii. p. 97, Abyssinia.

Tentyriides.

Paivæa hispida, Woll., noticed and figured; Fea, Ann. Mus. Genov. xviii. pp. 769 & 770.

Notioscythis, g. n., Fairmaire, Notes Leyd. Mus. v. p. 31. Allied to *Scythis*. Type, *N. puncto-seriata*, sp. n., *l. c.* p. 32, Saleyer.

New species :—

Trientoma martinicensis, Martinique, *lævis*, *ryticephala* [*rhytido-*], St. Domingo, and *convexipennis*, locality not stated, Allard, Ann. Ent. Belg. xxvii. (1) p. 14.

Anatolica oblonga, id. *l. c.* p. 19, Siberia.

Tentyria giraffa, id. *l. c.* p. 22, Arabia.

Stegatopsis arabica, id. *l. c.* p. 23, Arabia.

Mesostenopa tricostata, id. *l. c.* p. 24, Abyssinia.

Micipsa ovoidea, Fairmaire, S. E. Z. xliv. p. 460, Tripoli.

Oxycara olcesii, id. C.R. ent. Belg. xxvii. p. cxi., Rabat (Morocco).

Epitragus costipennis, Mendoza, p. 69, *bacchulus*, Cordoba, p. 70, *porcellus*, Cordoba, Tucuman, p. 71, *lævicollis* (Mackl. MS.), Mendoza, Cordoba, *striolatus*, Buenos Aires, p. 72, *mucidus*, p. 73, and *arcicollis*, Tucuman, p. 74, Berg, An. Soc. Arg. xv.

Himatismus lindneri and *planicollis*, Kolbe, B. E. Z. xxvii. pp. 22 & 23, Chinchoxo.

Adelostomides.

Aspila dohrni, Haag, noticed; Dohrn, S. E. Z. xliv. p. 159.

Akisides.

Akis kobelti, sp. n., Von Heyden, Ber. senck. Ges. 1882–83, p. 236, Morocco.

Scaurides.

Scaurus macricollis, sp. n., Allard, Ann. Ent. Belg. xxvii. (1) p. 24, Mesopotamia, Egypt.

Blaptides.

Blaps oblonga and var. *major*, Kraatz, Deutsche E. Z. xxvii. pp. 349 & 350, Osch; *B. lajoyii*, Allard, Ann. Ent. Belg. xxvii. (1) p. 26, Persia: spp. nn.

Prosodes cordicollis, id. *l. c.* p. 25, Persia; *P. catenulata*, *angulicollis*, *grandicollis*, and *longicornis*, Kraatz, *l. c.* pp. 346–349, Osch: spp. nn.

Asidides.

Asida convexicollis, Reynosa, Spain, and *foveicollis*, Bône, Algeria, Allard, Ann. Ent. Belg. xxvii. (1) p. 27; *A. macra*, Horn, Tr. Am. Ent. Soc. x. p. 304, pl. ix. fig. 10, New Mexico, Arizona: spp. nn.

Scotinus antavarus, sp. n., Ancey, Nat. Sicil. ii. p. 118, N.E. Madagascar.

Pimeliides.

Pimelia interstincta, coordinata, inæqualis, and *plinthota*, Fisch., are not from Turcomania, but from Anatolia; *P. cristata*, Sénac, = *Podhomala fausti*, Kraatz; *P. dejeani*, Sol., falls, being founded on specimens of *P. interstitialis*, Sol., and *grandis*, Klug; *P. oxysterna*, Sol., = *cephalotes*, Pall.; *P. retro-spinosa*, Luc., = *semihispida*, Fairm.; for *P. retro-spinosa* of collections the name *confusa* is proposed: Sénac & Bedel, Bull. Soc. Ent. Fr. (6) iii. pp. xxiv. & liv.

Leucolæphus latifrons, Fairmaire, redescribed by him; Ann. Soc. Ent. Fr. (6) iii. p. 97.

Lasiostola grisescens, Osch, p. 350, *grandis*, p. 358, and *elongata*, Tekke-Turcomania, p. 359, spp. nn., Kraatz, Deutsche E. Z. xxvii.

Molyrides.

Eusattus, Lec. Synopsis of N. American species; *E. dilatatus* and *muricatus*, Lec., are synonymous: Horn, Tr. Am. Ent. Soc. x. pp. 304 & 305.

New species:—

Psammodes rugicollis, Kolbe, B. E. Z. xxvii. p. 23, Chinchoxo; *P. aeuductus*, Ancey, Nat. Sicil. ii. p. 118, Uzagara.

Vieta crinita, Lake Nyassa, and *erosa*, Abyssinia, Allard, Ann. Ent. Belg. xxvii. (1) pp. 28 & 29.

Calymmatophorus uspallatensis, Berg, An. Soc. Arg. xv. p. 77, Mendoza.

Eusattus politus, Horn, Tr. Am. Ent. Soc. x. p. 304, California.

Crypticus melanc[h]roides, Fairmaire, R. Z. (3) vii. p. 193, El-Aghouat; *C. murinus*, Allard, *l. c.* p. 30, Egypt.

Pedinides.

Platyscelis rotundangula, difficilis, p. 351, and *simplex*, p. 352, spp. nn., Kraatz, Deutsche E. Z. xxvii., Osch.

Opatrides.

Brachyesthes, Fairm. This genus should be placed near *Anemia*; *B. approximans*, Fairm., = *pilosellus*, Mars., and *pilosellus*, Fairm., is renamed *brevior*: Fairmaire, C.R. ent. Belg. xxvii. p. cxiii.

Cœdius chrysomelinus, Costa, referred to *Brachyesthes*; id. R. Z. (3) vii. p. 194, note.

Platyola fusicornis, Rey, discussed; Rey, Ann. Soc. L. Lyon, xxix. pp. 150–152.

Halonomus salinicola, Woll., *oblongiusculus*, Fairm., p. 196, and *lineicollis*, Fairm., p. 197, note, redescribed; Fairmaire, *l. c.*

New genera and species :—

Perithrix, Fairmaire, R. Z. (3) vii. p. 193. Resembles *Byrrhus*, but allied to *Brachyesthes*. Type, *P. granidorsis*, sp. n., *ibid.*, Souf.

Scleroides, id. Notes Leyd. Mus. v. p. 32. Allied to *Sclerum*, *Opatrum*, and *Phylax*. Type, *S. pluricostatus*, sp. n., *l. c.* p. 33, Saleyer.

Brachyidium, id. *l. c.* p. 33. A transitional form from the *Sclerides* to the *Opatrides*. Type, *B. breviusculum*, sp. n., *ibid.*, Saleyer.

Sclerum strangulatum, Allard, Ann. Ent. Belg. xxvii. (1) p. 31, Abyssinia.

Gonocephalum demaisonis, id. *l. c.* p. 32, Egypt.

Opatrum picescens, Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 98, Abyssinia ; *O. humeridens*, id. Le Nat. v. p. 205, and Ann. Soc. Ent. Fr. (6) iii. p. 98, Abyssinia ; *O. hispido-costatum*, id. Ann. Ent. Belg. xxvii. (2) p. 23, New Britain ; *O. subsetosum*, Kolbe, B. E. Z. xxvii. p. 24, Chinchoxo ; *O. dentale*, Berg, S. E. Z. xliv. p. 396, Buenos Aires.

Halonomus cribricollis, Abyssinia, and *schneideri*, Cairo, Allard, *l. c.* p. 31.

Trachyscelidides.

Anemia opacula, Fairmaire, redescribed by him ; Ann. Soc. Ent. Fr. (6) iii. p. 99.

Ammotrypes, g. n., Fairmaire, R. Z. (3) vii. p. 194. Apparently allied to *Anemia* and *Ammophthora*. Type, *A. crenulicollis*, sp. n., *l. c.* p. 195, Souf.

Bradymerus violaceus, Philippines, and *cyaneipennis*, Ceylon, Pascoe, Ann. N. H. (5) xi. pp. 437 & 438 ; *B. granaticollis*, Duke of York Island, and *semiasperatus*, New Britain, Fairmaire, Ann. Ent. Belg. xxvii. (2) pp. 23 & 24 : spp. nn.

Bolitophagides.

Mychestes congestus, sp. n., Pascoe, Ann. N. H. (5) xi. p. 436, Port Bowen.

Ozolais divisa and *gibbera*, spp. nn., *id. l. c.* p. 437, Ega.

Diaperides.

New genera and species :—

Leiochrinus, Westwood, Tijdschr. Ent. xxvi. p. 68. Allied to *Diaperis*, *Nilio*, and *Hemicyclus*, but shape of *Coccinella*. To include *L. fulvicollis* (type), pl. iii. fig. 14 (& pl. v. figs. 1–7, details), *nigricornis*, New Guinea, &c., p. 70, *rufo-fulvus*, Aru, *lutescens*, Mount Ophir, and *testaceus*, Menado, p. 71, spp. nn.

Leiochrodes, id. *l. c.* p. 69. Subgenus of *Leiochrinus*. To include *L. discoidalis* (type), pl. iii. fig. 15 (& pl. v. figs. 8–13, details), Batavia, p. 71, *piceus*, *fulvescens*, Sumatra, *nigripennis*, Dorey, Ceram, Gilolo, p. 72, *medianus*, *chalybeatus*, Batchian, &c., *subpurpurascens*, Dorey, Aru, Waigiou, *suturalis*, Tondano, Amboina, &c., *picicollis*, Mysol, p. 73, *castaneus*, *bispilotus*, *octo-maculatus*, Sarawak, *rufo-fulvus*, Sulla, *parvulus*, Dorey,

limbatus, Singapore, p. 74, *agathidioides*, Aru, and *coccinelloides*, Ceylon, p. 75, spp. nn.

Leiochbrota, Westwood, *l. c.* p. 70. Subgenus of *Leiochrinus*. To include *L. uniformis* (type), pl. v. figs. 14–16 (details), Menado, Tondano, and *varicolor*, Sarawak, spp. nn., *l. c.* pp. 75 & 76.

Leiochrotina, id. *l. c.* p. 70. Subgenus of *Leiochrinus*. Type, *L. indica*, sp. n., *l. c.* p. 76, pl. v. figs. 17 & 18 (details), India.

Ceropria viridula, Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 24, New Britain; *C. dolorosa*, id. Notes Leyd. Mus. v. p. 34, Saleyer.

Alphitophagus nigro-trabeatus, id. R. Z. (3) vii. p. 197, El-Amr.

Menimus curtulus and *piceus*, Broun, N. Z. J. Sci. i. pp. 376 & 377, New Zealand.

Ulomides.

Tribolium ferrugineum, Fabr. (= *castaneum*, Luc., *olim*), noticed; Lucas, Bull. Soc. Ent. Fr. (6) iii. p. lxxi.

Palorus depressus, Fabr. Enormous numbers in grain; Cook, Bull. U. S. Agric. Ent. ii. p. 32.

Uloma rufula, sp. n., Fairmaire, Le Nat. v. p. 206, and Ann. Soc. Ent. Fr. (6) iii. p. 99, Abyssinia.

Cataphronetis prolixa, sp. n., *id.* R. Z. (3) vii. p. 198, Biskra.

Toxicum nudicorne, id. Ann. Ent. Belg. xxvii. (2) p. 25, Duke of York Island; *T. heros*, Frivaldszky, Term. füzetek, vi. p. 139, pl. i. fig. 5, Borneo; *T. gracile*, Pascoe, Ann. N. H. (5) xi. p. 438, New South Wales: spp. nn.

Anthracias ruficollis, sp. n., *id. l. c.* p. 439, Matabello, Saylee.

Cœlometopides.

Centronopus speciosus, sp. n., Pascoe, Ann. N. H. (5) xi. p. 439, Chontales.

Tenebrionides.

Athrodactyla, Klug, is incorrectly written *Arthrodactyla* by many authors; Dohrn, S. E. Z. xliv. pp. 372 & 373.

Dolichoderus dimidiatus, Waterh., redescribed; *id. l. c.* pp. 106 & 107.

New species:—

Nyctobates illasicollis and *punctulator*, Fairmaire, Ann. Ent. Belg. xxvii. (2) pp. 25 & 26, Duke of York Island.

Derospharus interstitialis, id. Notes Leyd. Mus. v. p. 35, Saleyer.

Dilamus planicollis, id. C.R. ent. Belg. xxvii. p. xliv., Biskra.

Dolichoderus laticornis, id. Le Nat. v. p. 365, Madagascar.

Lorelus quadricollis, Broun, N. Z. J. Sci. i. p. 377, New Zealand.

Heterotarsides.

Lyprops forticornis, Fairmaire, Notes Leyd. Mus. v. p. 35, Saleyer; *L. atro-nitens*, id. Ann. Ent. Belg. xxvii. (2) p. 27, New Britain: spp. nn.

Cyphaleides.

Hemicyclus discicollis, sp. n., Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 27, Duke of York Island.

Cnodalinides.

Bradynocerus, g. n., Fairmaire, Notes Leyd. Mus. v. p. 36. Intermediate between *Tetraphyllus* and *Camaria*, but the metasternum is short, the labrum does not pass the epistoma and is sometimes retracted, and the antennæ are very short. Type, *B. aulacopterus*, sp. n., *l. c.* p. 37, Saleyer.

Thecacerus sycophanta, sp. n., Pascoe, Ann. N. H. (5) xi. p. 440, Minas Geraes.

Camaria gloriosa, Fairmaire, Le Nat. v. p. 365, Madagascar; *C. pulcherrima*, Paraná, and *austera*, Chaco, Tucuman, Berg, An. Soc. Arg. xv. pp. 75 & 76: spp. nn.

Helopides.

Phymæus, g. n., Pascoe, Ann. N. H. (5) xi. p. 439. Allied to *Osdara*; scutellum absent, clypeus emarginate, prothorax flattish, elytra very convex, or even gibbous, with distinct epipleura. Type, *P. pustulosus*, sp. n., *l. c.* p. 440, Ceylon.

New species:—

Adelium cheesemani and *chalmeri*, Broun, N. Z. J. Sci. i. p. 378, New Zealand.

Læna merkli, Weise, Deutsche E. Z. xxvii. p. 313, Constantinople.

Chariotheca thalassina, Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 28, New Britain.

Helops (*Diastixus*) *obtusatus*, Biskra, and *H.* (*Catomus*) *batnensis*, Batna, *id.* C.R. ent. Belg. xxvii. p. xliv.

Nalassus læviusculus, Andalusia, and *alicantinus*, Alicante, Kraatz, Deutsche E. Z. xxvii. p. 395.

Nephodes incanus, Fairmaire, R. Z. (3) vii. p. 199, Lambessa.

Diastixus acutangulus, id. *ibid.*, Algerian Sahara.

Helopinides.

Micrantereus fimbritibius, Fairm., and *gerstæckeri* and *rugulosus*, Gestro, redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) iii. pp. 101 & 102.

Megacanthides.

Hoplonyx subopacus, Fairmaire, redescribed by him; Ann. Soc. Ent. Fr. (6) p. 100.

Emenadæmis sinuaticollis, sp. n., Kolbe, B. E. Z. xxvii. p. 24, Chinchoxo.

Ci. p. 280.

Metacrygmides.

Synopticus quadricollis and *myrmido*, Fairmaire, redescribed by him; Ann. Soc. Ent. Fr. (6) iii. pp. 100 & 101.

Amarygmus alienus, sp. n., Pascoe, Ann. N. H. (5) xi. p. 441, Ceylon.

Dietysus modestus, Fairmaire, Notes Leyd. Mus. v. p. 37, Saleyer; *orientalis*, id. Ann. Ent. Belg. xxvii. (2) p. 29, New Britain: spp. nn.

Strongyliides.

Œnomia, g. n., Pascoe, Ann. N. H. (5) xi. p. 441. Allied to *Epiplecta*; antennæ rather short, widened from the 4th joint to the 10th, the last smaller, and rounded. Type, *Œ. femorata*, sp. n., *ibid.*, Para.

Messalia, g. n., *id. l. c.* p. 442. Allied to *Œnomia*; antennæ longer, dilated from 5th joint, 6th and 7th petiolated, 11th oblong, rounded at apex. Type, *M. varians*, sp. n., *ibid.*, Gilolo, Penang.

Cistelidæ.

Hymenorus rufipes, Fabr., myrmecophilous; Am. Nat. xvii. p. 1176.

Prostenus militaris, Pascoe, figured; Waterhouse, Aid, ii. pl. cxxix. fig. 7.

Synallecula, g. n., Kolbe, B. E. Z. xxvii. p. 25. Allied to *Allecula*; To include *A. livida* and *picea*, Thoms., and *S. sororcula*, sp. n., *ibid.*, Chinchoxo.

Allecula divisa, Reitter, Rev. mens. Ent. i. p. 115, Caucasus; *A. flavicornis* and *plebeia*, Kolbe, B. E. Z. xxvii. p. 25, Chinchoxo: spp. nn.

Cistela impressiuscula, Fairmaire, Le Nat. v. p. 206, and Ann. Soc. Ent. Fr. (6) iii. p. 103, Abyssinia; *C. dense-punctata*, id. Notes Leyd. Mus. v. p. 38, Saleyer; *C.* (*Pseudocystela*) (*Isomira*) *paupercula*, Baudi, Nat. Sicil. iii. p. 3, Sicily: spp. nn.

Cteniopus græcus, sp. n., Von Heyden, Deutsche E. Z. xxvii. p. 312, Greece.

Xylochus dentipes, sp. n., Broun, N. Z. J. Sci. i. p. 379, New Zealand.

Pythidæ.

Salpingus hirtus, *simplex*, and *quisquilius*, spp. nn., Broun, N. Z. J. Sci. i. p. 380, New Zealand.

Rhinosimus luteo-nitens, sp. n., Fairmaire, R. Z. (3) vii. p. 206, Morocco.

Melandryidæ.

Alloptérus, g. n., Broun, N. Z. J. Sci. i. p. 381. Allied to *Ctenoplectron*. To include *C. ornatum*, Broun, and *A. reticulatus*, sp. n., *ibid.*, New Zealand.

Zilora elongata, sp. n., Sahlberg, Medd. Soc. Fenn. vii. p. 133, Finland [1881].

Lagriidæ.

Porrolagria, g. n., Kolbe, B. E. Z. xxvii. p. 26. Intermediate *Lagria* and *Eutrapela*. Type, *P. nuda*, sp. n., *l. c.* p. 27, Chincho.

Lagria falkensteini, *simulatrix*, and *brevicornis*, Kolbe, B. E. Z. xxvii. p. 26, Chinchoxo; *L. longipennis*, Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 102, Abyssinia: spp. nn.

Cyara rufo-nitens, sp. n., Fairmaire, *l. c.* p. 102, Abyssinia.

Homostira crenato-striata, sp. n., *id.* Notes Leyd. Mus. v. p. 39, Saleyer. p. 2.

Pedilidæ.

Corphyra, Say. Synopsis of the N. American species, with figures of the different forms of the œdeagus; Horn, Tr. Am. Ent. Soc. x. pp. 305–310, pl. ix. figs. 11–18.

Scraptia ophthalmica, Muls. Head figured; Reitter, Wien. ent. Z. ii. pl. ii. fig. 5.

Trotommidea, g. n., Reitter, Wien. ent. Z. ii. p. 307. Allied to *Scraptia* and *Trotomma*. Type, *T. salonæ*, sp. n., *ibid.* pl. iv. figs. 4 & 4*a–f*, Spalato.

Corphyra flabellata, sp. n., Horn, Tr. Am. Ent. Soc. x. p. 306, Western Nevada.

Xylophilus læsicollis, sp. n., Fairmaire, C.R. ent. Belg. xxvii. p. cxiii., Algeria.

Anthicidæ.

Anthicus floralis, Linn. Larva described; Rey, Ann. Soc. L. Lyon, xxix. pp. 141 & 142.

Formicomus biskrensis, sp. n., Fairmaire, C.R. ent. Belg. xxvii. p. clvii., Biskra.

Anthicus bonnairii, id. *l. c.* p. xlv., Biskra; *A. blechroides*, Baudi, Deutsche E. Z. xxvii. p. 150, Tiberias: spp. nn.

Aulacoderus guineensis and *lionychoides*, spp. nn., Kolbe, B. E. Z. xxvii. pp. 277 & 278, Chinchoxo.

Mordellidæ.

Mordellistena, Costa. Notes on various N. American species; J. B. Smith, Bull. Brooklyn Soc. v. pp. 80 & 81, vi. pp. 3–5.

Mordella leucospila, Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 30, Duke of York Island; *M.* [? error for *Mordellistena*] *immaculata*, Smith, Bull. Brooklyn Soc. vi. p. 5, District of Columbia; *M. carinata* and *flaviventris*, id. *op. cit.* vii. p. 3, Florida, Texas, &c.: spp. nn.

Mordellistena erratica, *pratensis*, Florida, and *tarsalis*, Texas, *id. op. cit.* v. p. 80; *M. conformis* and *hirticula*, id. *op. cit.* vi. p. 4, Texas, &c.: spp. nn.

Stenalia bisecta, sp. n., Baudi, Nat. Sicil. iii. p. 5, Sicily.

Rhipidophoridæ.

Emenadia tricolor, Gerst. (?), redescribed; Waterhouse, Ann. N. H. (5) xi. p. 280.

Metœcus paradoxus, Linn. Life-history, habits, &c.; Hoffer, Ent. Nachr. ix. pp. 45–49 (*cf.* also Gradl, *tom. cit.* pp. 68 & 69).

Rhipidophorus oberthu[*e*]*ri*, sp. n., Fairmaire, R. Z. (3) vii. p. 200, Biskra.

Trigonodera pruinosa, sp. n., Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 32, New Britain.

Emenadia sodalis, Fianarantsoa, *armata*, Coimbatore, and *sobrina*, Melbourne, spp. nn, Waterhouse, Ann. N. H. (5) xi. pp. 279–281.

Stylopidæ.

Notes on *Strepsiptera* ; Friese, Ent. Nachr. ix. pp. 64–67.

Cantharidæ.

Katter, F. Monographie der europäischer Arten der Gattung *Meloe* mit besonderer Berücksichtigung der Biologie dieser Insekten. Ent. Nachr. ix. pp. 85–114.

Discusses nomenclature, the medicinal use of cantharides, and the metamorphoses of *Meloe* and *Sitaris*.

——. Die Canthariden spec. *Meloe* als Heilmittel der Tollwuth in älterer und neuerer Zeit. *L. c.* pp. 156–183.

Calls attention to an anonymous work published in 1782 (overlooked by Hagen), containing three documents on the subject, of considerable interest and importance.

Fabre, Nouv. Souv. Ent. pp. 262–349, records his observations on *Sitaris* and *Meloe* in great detail. The larvæ of *Sitaris*, *Meloe*, *Zonitis*, and probably other genera, pass through four different stages between the egg and the pupa state, which he calls the primary larva, the second larva, the pseudochrysalis, and the third larva. The primary larva is coriaceous, and when carried into the cell of a bee, it devours the egg which it finds there. The second larva is soft, differs entirely in its external characters, and devours the honey in the cell. The pseudochrysalis is a motionless body, covered with horny integuments like those of chrysalids. The third larva much resembles the second, and then the true pupa is developed.

Riley recognizes six larval stages in the *Meloidæ* ; Am. Nat. xvii. pp. 790 & 791.

Meloe, Linn. Larva infesting *Lycæna baton* ; Pérez & Brown, Act. Soc. L. Bord. xxxvi. p. xlvi. *M. angusticollis*, Say : the peculiar structure of the antennæ in the ♂ consists of a kind of hinge, formed of joints 5–7, which is used to grasp the antennæ of the ♀ during copulation ; Hill, Am. J. Sci. (3) xxv. pp. 137 & 138, figs.

Horia senegalensis, Cast., discussed ; the sexes are still insufficiently known : De Borre, C.R. ent. Belg. xxvii. pp. cxxxvi.–cxxxviii.

Mylabris marseuli, Kirsch, *nec* Ball., renamed *viridula* ; Marseul, Nouv. et faits, ii. p. 170. *M. pustulata*, Thoms., noticed and figured ; Rosche-brune, Bull. Soc. Philom. (7) vii. p. 188, pl. iii. fig. 8.

Zonabris, Har. 11 species (5 new) noticed from Samarcand ; Von Heyden, Deutsche E. Z. xxvii. pp. 65–68 & 356.

Cantharis, Linn. Horn gives a revised synopsis of the N. American species belonging to his Group 2 ; Tr. Am. Ent. Soc. x. p. 311. *C. cinereo vestita*, *thiebaulti*, p. 201, and *myrmido*, p. 202, Fairmaire, redescribed

by him; R. Z. (3) vii. *C. nuttalli*, Say, injurious to wheat; Riley, Am. Nat. xvii. p. 1174.

Lytta divirgata, Vill. & Peñ. The following are synonyms:—*Cantharis maculata*, Lac. (*nec* Say), *vittigera*, Burm. (*nec* Blanch., *nec* Lec.), and *lacordairii*, Berg; Berg, Ann. Soc. Arg. xv. pp. 67 & 68.

Epicauta chanzii, Fairmaire, redescribed by him; R. Z. (3) vii. p. 202. *E. ruficeps*, Ill.: poisonous qualities discussed; Piaget, Tijdschr. Ent. xxvi. pp. cxxxvii.–cxl. *E. femoralis*, Er., Sol., *nec* Klug, renamed *erythroscelis*; Berg, An. Soc. Arg. xvi. p. 270.

Zonitis abyssinica and *xanthoptera*, Fairmaire, redescribed by him; Ann. Soc. Ent. Fr. (6) iii. p. 105, and R. Z. (3) vii. p. 203.

Hapalus bimaculatus, Linn, rediscovered in Finland; Sahlberg, Medd. Soc. Fenn. ix. pp. 82–87.

Sitaris muralis, Forst., occurring in nests of *Pelopœus spirifex* and *Megachile argentata*, Fabr.; Destefani, Nat. Sicil. iii. pp. 9 & 10.

New genera and species :—

Zonitoides, Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 31. Allied to *Zonitis*; eyes large, a little separated above, but hardly below; coarsely granulated; antennæ longer than the body, slender, and palpi also slender. Type, *Z. megalops*, sp. n., *l. c.* p. 32, Duke of York Island [nec *Zonitides*, Ab., 1881 !].

Sitarobrachys, Reitter, Wien. ent. Z. ii. p. 309. Allied to *Zonitis* and *Sitaris*. Type, *S. brevipennis*, sp. n., *ibid.* pl. iv. figs. 6 & 6*a*, Balkans.

Mylabris haccolyssa, Rochebrune, Bull. Soc. Philom. (7) vii. p. 182, pl. iii. figs. 1–7, Abyssinia, Senegambia; *M. madoni*, Marseul, Nouv. et faits, ii. p. 178, Cyprus.

Zonabris pullata, sodalis, p. 65, *undecim-notata, impedita*, p. 66, *excisofasciata* (and var. *oschensis*, p. 353), Samarcand, p. 67, *parum-picta*, Persia, p. 353, *triangulifera*, p. 359, and *tekkensis*, Tekke-Turcomania, p. 360, Von Heyden, Deutsche E. Z. xxvii.

Decatoma diffinis, Kolbe, B. E. Z. xxvii. p. 24, Chinchoxo.

Cantharis hellenica, Von Heyden, *l. c.* p. 310, Greece; *C. mendax*, Fairmaire, R. Z. (3) vii. p. 200, Ainkala; *C. spurcaticollis*, id. Ann. Soc. Ent. Fr. (6) iii. p. 104, Abyssinia; *C. meloidea*, id. Le Nat. v. p. 197, and Ann. Soc. Ent. Fr. (6) iii. p. 104, Abyssinia; *C. gentilis*, New Mexico, Arizona, p. 311, *occipitalis* and *incommoda*, Southern California, p. 312, Horn, Tr. Am. Ent. Soc. x.

Calospasta viridis, id. *l. c.* p. 312, Colorado, New Mexico.

Lytta frontalis, Kolbe, *l. c.* p. 24, Chinchoxo; *L. aratæ* and *monachica*, Berg, An. Soc. Arg. xv. pp. 66 & 68, Mendoza.

Nematognatha peringueyi, Fairmaire, Bull. Soc. Ent. Fr. (6) iii. p. lxx., Cape of Good Hope.

ŒDEMERIDÆ.

Anoncodes stenodera, *Chitona semiridua*, and *Mycterus gracilior*, Fairm., redescribed by him; R. Z. (3) vii. pp. 204–206.

Thelyphassa diaphana, Pascoe, figured ; Waterhouse, Aid, ii. pl. cxxxiii. fig. 6.

Ananca quadripunctulata, Fairmaire, Notes Leyd. Mus. v. p. 40, Saleyer ; *A. hottentota*, id. Bull. Soc. Ent. Fr. (6) iii. p. lxxi., South Africa ; *A. opacipennis*, id. Ann. Ent. Belg. xxvii. (2) p. 32, Duke of York Island ; spp. nn.

Nacerdes fusco-strigosa, sp. n., *id.* R. Z. (3) vii. p. 203, Souf.

Proboscа infima, sp. n., *id. l. c.* p. 204, Biskra.

Chitona gracilicollis, sp. n., *id. l. c.* p. 205, El-Amri.

Thelyphassa conspicua, sp. n., Broun, N. Z. J. Sci. i. p. 381, New Zealand.

Curculionidæ.

Bedel, L. Faune des Coléoptères du bassin de la Seine et de ses bassins sécondaires. II. Sous-Ordre *Rhynchophora*. Ann. Soc. Ent. Fr. (6) iii. (sep. pag.) pp. 33–44.

Extends from *Brachyrrhinus* to *Rhytidoderes*.

Stierlin, G. Bestimmungstabellen europäischer Coleoptern. IX. *Curculionidæ*. MT. schw. ent. Ges. vi. pp. 403–645.

The author divides the family into 30 named groups, which are tabulated. The portion now published includes only the first of these, the *Otiorrhynchini*. A considerable number of new species are described. The genus *Otiorrhynchus* is divided into 38 sections, placed under 7 subgenera.

List of *Curculionidæ* (many new) collected by Haberhauer at Margelan and Samarcand ; Faust, Deutsche E. Z. xxvii. pp. 99-101.

Genera of the *Otiorrhynchini* and *Brachyderini* tabulated ; *id. l. c.* pp. 82–85.

Brachyderides.

Catapionus discussed, and many new species described ; the genus is closely allied to *Cneorrhinus* ; among known species, *C. viridimetallicus*, Motsch., and *viridanus* and *maculatus*, Tourn., are specially noticed: Faust, Deutsche E. Z. xxvii. pp. 81–98.

Polydrosus cervinus, Linn. (= *messor*, Herbst), and *pilosus*, Gredl. (= *binotatus*, Thoms., *nodulosus*, Chevr., and *peragallonis*, Desbr.), discussed ; Letzner, JB. schles. Ges. lx. pp. 285–288.

Polyclœis raffrayi, Fairmaire, redescribed by him ; Ann. Soc. Ent. Fr. (6) iii. p. 105.

Pachyrrhynchus biplagiatus, Bates, = *plutus*, Oberth. ; Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 33.

New genera and species :—

Dyscheres, Pascoe, Notes Leyd. Mus. v. p. 83. Differs from *Anemerus* in its bilobed penultimate tarsal joint, and from *Atmetonychus* in its connate claws. Type, *D. agrestis*, sp. n., *l. c.* p. 84, Saleyer; add *D. gracilis*, Timor, Flores, p. 84, note, *macularius*, Yemen, and *rugosus*, Cambodia, p. 85, note, spp. nn., *l. c.*

Astycomerus, Kolbe, B. E. Z. xxvii. p. 28. *Tanymecini*; types, *A. spurius* and *privignus*, spp. nn., *l. c.* p. 29, Chinchoxo.

Omotrachelus, id. *l. c.* p. 29. *Geonomini*; type, *O. difformis*, sp. n., *l. c.* p. 30, Chinchoxo.

Styrcus, Pascoe, Ann. N. H. (5) xii. p. 413. Facies of *Geonomus*; type, *S. geonomoides*, sp. n., *ibid.*, Australia.

Holonychus inæquicollis, Fairmaire, Le Nat. v. p. 365, Madagascar.

Blosyrus setifer and *lentulus*, Kolbe, B. E. Z. xxvii. p. 30, Chinchoxo.

Catoptes attenuatus, Broun, N. Z. J. Sci. p. 430, New Zealand.

Catapionus lineatus, p. 87, *kraatzi*, Ala-Tau, p. 88, *agrestis*, Tashkent, p. 89, *semiglabratus*, p. 90, *irresectus*, Shar-Tash, p. 91, *inexpectatus*, *iratus*, p. 92, *brevicornis*, p. 93, *dispar*, Ala-Tau, *heydeni*, Songaria, p. 94, *confinis*, Son-Kul Pass, p. 95, *sulcicollis*, River Taar-Su, *simplex*, Central Asia, p. 96, *moderatus*, Songaria, and *gebleri*, Dauria, p. 97, Faust, Deutsche E. Z. xxvii.

Brachyderes opaculus, Fairmaire, C.R. ent. Belg. xxvii. p. clviii., Batna.

Mesagræus manifestus, Samarcand, p. 108, *rusticanus*, locality not stated, p. 109, *terrestris*, *erinaceus*, Turkistan, p. 110, *sus*, Tashkent, p. 111, and *viduatus*, Samarcand, p. 112, Faust, *l. c.*

Sitones fronto, Tashkent, Samarcand, p. 112, *ignavus*, Tashkent, *asellus*, Tashkent, Samarcand, p. 113, and *costipennis*, Samarcand, p. 114, *id. l. c.*

Ischnotrachelus inermis, *abnormis*, *humilis*, p. 27, and *major*, p. 28, Kolbe, *l. c.*, Chinchoxo.

Cimbus sebituane, Ancey, Nat. Sicil. ii. p. 119, Usagara; *C. pullus*, Kolbe, *l. c.* p. 28, Chinchoxo.

Catamonus robustulus, id. *l. c.* p. 29, Chinchoxo.

Celebia suturalis, Pascoe, Notes Leyd. Mus. v. p. 85, Saleyer.

Pachyrrhynchus plutus, New Britain, and *constellatus*, Fiji, R. Oberthür, Bull. Soc. Ent. Fr. (6) iii. p. xxv.

Otiorrhynchides.

Chevrolat, A. Des genres de Curculionides, *Episomus* [24], *Platyomichus* [5], *Syntaphocerus* [8], et *Zircosa* [1], du nombre des espèces de ces genres, synonymies et nouvelles espèces. Rev. mens. Ent. i. pp. 74–85.

The species in the author's collection are marked with an asterisk. The following synonymy, &c., occurs:—*Episomus platyna*, Boh., = *nigrolineatus*, Wiedm.; *pauperatus*, Fabr., = *chrysostigma*, var., Wiedm.; *lacerta*, Fabr., = *crenatus*, Dej. Cat.; *lentus*, Boh., = *lateralis*, Eyd., *nebulosus*, Boh., and *cratocerus*, Guér.; *E. gracilicornis*, Rits., is not a true *Episomus*; *Platyomicus echinus*, Fabr., = *sulcicollis*, Thoms.; *Syntaphocerus*, Thoms., = *Bryochæta*, Pasc.; and *S. hispidulus*, Thoms., = *viridis*, Pasc.

Fairmaire redescribes his *Systates abyssinicus*, *Otiorrhynchus raffrayi*, *phœostictus* and *brachyderoides*; Ann. Soc. Ent. Fr. (6) iii. pp. 106–108.

Otiorrhynchus (*Dodecastichus*) *pulverulentus*, Fabr., var. *hopffgarteni*

(Tourn., MS.) noticed from Moldavia; Stierlin, MT. schw. ent. Ge vi. p. 422.

Apirocalus cornutus, Pascoe, figured; Waterhouse, Aid, ii. pl. cxx. fig. 9.

Peritelus caucasicus, Stierl., = *Otiorrhynchus kirschi*, Stierl.; Reitter, Wien. ent. Z. ii. p. 96.

Eurychirus, Stierl., *nec* Waterh., renamed *Araramichnus*; Des Gozis, MT. schw. ent. Ges. vi. p. 414.

Barypithes, Seidl., = *Omias*, auctt. (both preoccupied), renamed *Exomias*; Bedel, Faune Col. Seine, ii. p. 43.

Phyllobius xanthocnemus, Kies., var. *ragusæ*, Stierl., noticed; Ragusa, Nat. Sicil. ii. p. 303.

New genera and species :—

Gynaria, Pascoe, Ann. N. H. (5) xii. p. 89. Differs from *Isomerinthus* in its stout rostrum not narrower than the head, in the shorter scape, hardly extending to the prothorax, and in the presence of a scutellum. Type, *G. nasuta*, sp. n., *ibid.*, Aru.

Cryphiphorus, Stierlin, MT. schw. ent. Ges. vi. p. 411. Subgenus of *Otiorrhynchus*; front tibiæ straight, or curved inwards in ♂, hind tibiæ always straight, widened at the extremity; sockets strongly hollowed, and bordered with a strongly-developed fringe of bristles; two first ventral segments granulated. To include *O. ligustici*, Linn., and allies.

Pseudomeira, id. *l. c.* p. 585. Subgenus of *Peritelus*; antennal furrows deep but very short; proboscis concave at the tip, very broad, parallel; scape of the antennæ at least as thick as in *Meira crassicornis*, Duv. Types, *P. nicæensis* and *clairi*, spp. nn., *l. c.* p. 601, Mentone.

Argoptochus, Weise, Deutsche E. Z. xxvii. p. 255. To include the section of *Ptochus* with claws united at the base. Type, *P. bisignatus*, Germ.

Elytrogonus subangulatus, Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 34, Duke of York Island.

Trigonops vitticollis, id. *ibid.*, Duke of York Island.

Piezonotus diversus, Pascoe, Notes Leyd. Mus. v. p. 87, Saleyer.

Sphæropterus albido-plagiatus, Fairmaire, *l. c.* p. 35, Duke of York Island, New Britain.

Isomerinthus interruptus, Pascoe, Ann. N. H. (5) xii. p. 88, Fiji.

Otiorrhynchus apenninus, Apennines, p. 426, *grouvellii*, Maritime Alps, p. 433, *troyeri*, Croatia, p. 464, *styphloides*, Constantinople, p. 467, *borealis*, Lapland, p. 476, *breviclavatus*, Dalmatia, p. 482, *angustipennis*, Lower Engadine, *labilis*, Siebenbürgen, p. 483, *rivieræ*, Mentone, p. 484, *cr[illegible]pes*, Piedmont, p. 485, *branksiki*, Hungary, p. 518, *rufo-marginatus*, [illegible]ben-bürgen, p. 526, *O.* (*Arammichnus*) *angustifrons* (Faust, MS.) [illegible]sia, p. 539, *refrigeratus* (Faust, MS.), Issik-Kul, p. 541, *russicus*, Sh[illegible] *ærtzeni*, Greece, p. 544, *punctirostris*, Caucasus, p. 548, *granulato-p[illegible]* its con[illegible] Turkey, p. 549, *balassogloi* (Faust, MS.), Lemiretschin[illegible]sk, p. [illegible]rrisex, (*Tournieria*) *esau* (Faust, MS.), Issik-Kul, p. 559, *pun[illegible]æus*, Greece, p. 52, *osmanlis*, Caucasus, p. 570, *europæus*, Turk[illegible]y, p. 571, and *schumacheri*, Lebanon, p. 572, Stierlin, MT. schw. ent. Ges. vi.; *O. akinini*, *kuschake-*

Anemerus

witschi, and *tenuis*, Stierlin, Rev. mens. Ent. i. pp. 96–98, Turkistan; *O.* (*Tournieria*) *swaneticus*, Reitter, Rev. mens Ent. i. p. 116, Svanetia.

Systates fossulatus, Kolbe, B. E. Z. xxvii. p. 30, Chinchoxo; *S. angusticollis*, Taschenberg, Z. Naturw. lvi. p. 179, Socotra.

Episomus cataleucus, Bengal, *annulipes*, Ceylon, p. 77, *binodosus* and *incisipes*, Penang, p. 78, *apicalis*, Malacca, *nigro-sparsus*, Assam, p. 79, *bilineatus*, Malacca, p. 80, *humeralis* and *griseus*, Java, p. 81, and *parallelus*, Cochin China, p. 82, Chevrolat, Rev. mens. Ent. i.

Syntaphocerus semiviridus, *suberuciatus*, p. 83, *nigritus* and *ophthalmicus*, p. 84, *id. l. c.*, Old Calabar.

Holcorrhinus mutator, Fairmaire, C.R. ent. Belg. xxvii. p. xlvi., Algeria.

Nastus beatus, Tarbagatai, p. 102, *sareptanus*, Sarepta, p. 102, note, *trapezicollis*, Derbent, Lenkoran, p. 103, note, *concinnus*, North Persia, p. 104, *stierlini*, Kasbek, p. 104, note, *kuschakewitschi*, Wjernoe, *seidlitzi*, Tarbagatai, p. 105, *tigrinus*, p. 106, *fraternus* and *speculator*, Samarcand, p. 107, Faust, Deutsche E. Z. xxvii.

Peritelus leveillii, Brisout, Bull. Soc. Ent. Fr. (6) iii. p. vi., Ardèche.

Ptochus subacutus (Chevr., MS.), Stierlin, MT. schw. ent. Ges. vi. p. 604, Caucasus.

Cathormiocerus fastidiosus, Fairmaire, R. Z. (3) vii. p. 210, Tangiers.

Phyllobius logesi, Ragusa, Nat. Sicil. ii. p. 303, Sicily; *P. hochhuthi*, Faust, *l. c.* p. 108, Amur; *P. ater*, Greece, p. 610, *caucasicus*, Caucasus, p. 616, *caspius*, Astrabad, p. 618, *desbrochersi*, Greece, p. 625, and *hochhuthi*, Caucasus, p. 628, Stierlin, *l. c.*

Myllocerus christophi and *caspius*, id. *l. c.* p. 632, Sharud.

Leptopides.

Stenocorynus vexatus, sp. n., Pascoe, Ann. N. H. (5) xii. p. 89, Timor.

Leptops punctigera, Port Bowen, p. 413, *incompta* and *vermicosa*, Queensland, p. 414, spp. nn., *id. l. c.*

Tænophthalmides.

Tænophthalmus desbrochersi, Shahku, Persia, p. 115, *subcarinatus*, p. 116, and *kraatzi*, Margelan, p. 117, spp. nn., Faust, Deutsche E. Z. xxvii.

Byrsopides.

Fairmaire redescribes his *Eremiorrhinus margarinotus* and *Rhytidorrhinus singularis*; R. Z. (3) vii. pp. 211 & 215.

Hyphœria, g. n., Pascoe, Ann. N. H. (5) xii. p. 420. Allied to *Ethemaia*, but 3rd tarsal joint entire. Type, *H. assimilis*, sp. n., *ibid.*, Gayndah.

Borborocœtus signatipes, sp. n., Faust, Deutsche E. Z. xxvii. p. 118, Issik-Kul.

Rhytidorrhinus lúciæ, Ragusa, Nat. Sicil. ii. p. 304, Sicily; *R. allardi*, Faust, Rev. mens. Ent. i. p. 99, Tashkent; *R. gentilis*, Ménah, p. 214, *fulvo-cretosus*, Biskra, p. 215, and *caroli*, Bousaada, p. 216, Fairmaire, R. Z. (3) vii.: spp. nn.

Ethemaia angusticollis, Cape York, and *curtula*, West Australia, spp. nn., Pascoe, Ann. N. H. (5) xii. pp. 419 & 420.

Bothynoderes dohrni, Margelan. &c., p. 121, *balassogloi*, Ak-Kum, Jumen-Aryk, Ara-Sat, p. 122, and *B.* (*Themnorrhinus*) *verecundus*, River Naryn, &c., p. 123, Faust, *l. c.*

Chromonotus perofskii, id. *l. c.* p. 124, Kam-Bash; *C. margelanicus*, Margelan, *hirsutulus*, Orenburg, Khirghis Steppes, p. 97, and *vehemens*, Samarcand, p. 98, *id.* S. E. Z. xliv.

Pachycerus obliquatus, id. Deutsche E. Z. xxvii. p. 199, Samarcand.

Mecaspis darwini, Samarcand, Tashkent, p. 199, *glabratus*, Shahrud, p. 200, *obvius*, Samarcand, p. 201, and *praditus*, Ala-Tau, p. 202, *id. l. c.*

Xanthochelus postumus, id. *l. c.* p. 203, Asia Minor, Cairo.

Cleonus interstitialis and *mus*, Kolbe, B. E. Z. xxvii. p. 32, Chinchoxo; *C. exanthematicus*, Lambessa, and *sycophanta*, Biskra, Fairmaire, R. Z. (3) vii. pp. 211 & 212; *C.* (*Plagiographus*) *bonnairii*, id. C.R. ent. Belg. xxvii. p. xlvi., Biskra.

Lixus lateripictus, id. R. Z. (3) vii. p. 213, Biskra; *L. ritsemæ*, Pascoe, Notes Leyd. Mus. v. p. 97, Kaioa, Bachian, Makian, Sula, Timor, Salayer; *L. subnebulosus*, Kolbe, *l. c.* p. 31, Chinchoxo; *L. turkestanicus*, Samarcand (?), *diutinus*, Samarcand, Krasnovodsk, p. 204, *capiomonti*, Samarcand, Artsha, p. 205, *tschemkenticus*, p. 206, *strangulatus*, Tschemkent, *astrachanicus* (Becker, MS.), Astrakan, Margelan, Samgor, p. 207, and *lecontii*, Kasalinsk, p. 208, Faust, *l. c.*

Hylobiides.

Dysprosœstus, g. n., Kolbe, B. E. Z. xxvii. p. 32. Type, *D. costatus*, sp. n., *l. c.* p. 33, Chinchoxo.

Hylobius fasciculatus, sp. n., *id. l. c.* p. 32, Chinchoxo.

Orthorrhinus cuchromus, sp. n., Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 36, Duke of York Island, Somerset, N. Australia.

Liratus costatus, sp. n., Broun, N. Z. J. Sci. i. p. 433, New Zealand.

Erirrhinides.

Faust, J. Die Europäischen und Asiatischen Arten der Gattungen *Erirrhinus* [4], *Notaris* [11], *Icaris* [2], and *Dorytomus* [30]. Bull. Mosc. lvii. (2) pp. 113–188 & 368–468.

The genera and species are fully described. A few undetermined species are also noticed, not included in the above number.

Dorytomus tortrix, Linn. Transformations described; Letzner, JB. schles. Ges. lx. pp. 300 & 301.

Mecinus janthinus, Germ. Embryology and life-history; Buddeb[erg], JB. nass. Ver. xxxvi. pp. 124–130, pls. i. & ii. figs. 1–3.

Stephanorrhynchus crassus, Broun, figured; Waterhouse, Aid, i[ll.] pl. cxxxviii. fig. 1.

Pactola variabilis, Pascoe, figured; *id. l. c.* pl. cxxix. fig. 8.

New genera and species:—

Heterotyles, Broun, N. Z. J. Sci. i. p. 433. Type, *H. arge[ntatus]* sp. n., *l. c.* p. 434, New Zealand.

Cænophanus, Broun, *l. c.* p. 435. Allied to *Eugnomus*; abdomen narrowed in front, and longer. Type, *C. flavipilus*, sp. n., *ibid.*, New Zealand.

Aubaeonymus granicollis, Reitter, Deutsche E. Z. xxvii. p. 394, Andalusia.

Notaris dauricus, Dauria, pp. 144 & 155, *illibatus*, Siberia, pp. 147 & *Gy discretus* and *nivalis*, Central Asia, pp. 148 & 167, and *evers-*
Gymneti Siberia *remota*, A & 169, Faust, Bull. Mosc. lvii. (2).
Fairmaire, C.R. ent. Belg. S. Europe, Caucasus, pp. 379 & 394, *rolofsi*, *ictus* (Sch., MS.), Dauria, pp. 379 & 413, *sahl-*
Alcidides. 4, *nordenskiœldi*, Europe, Siberia, pp. 383
Alcides lewisi, ruptus, curiali 385 & 423, *dejeani* (Faust, MS.), Europe,
argutor, p. 126, Pascoe, Ann. N. MS.), Siberia, pp. 384 & 442, and *alter*
guessfeld[t]i, Kolbe, B. E. Z. xx l. c.; *D. elegans*, Sharp, Ent. M. M. xx
comus, Broun, N. Z. J. Sci. i. p. 434, New

Cryptorrhynchidæ

Orobitis cyan *brunneo-* *ictus*, Fairmaire, C.R. ent. Belg. xxvii
Schlechtendal, J
Acalles pyren *argutus*, Shar , *l. c.* p. 67, New Zealand.

Ge

Erirhinides. *apalus*,

rubicunda, Broun, figured; Waterho id, ii. pl. cxxxviii.
Trachocaulu
nus;

Apionides.

Phrygapion, g. n., Riley, Bull. Brooklyn Soc. iv. p. 62. Allied to *Apion*. with th *P. gallicola*, sp. n., *ibid.*, United States.
picata, sp. n. *maculipes* and *æneipenne*, Pascoe, Ann. N. H. (5) xi. p. 122, note, Singa *A. lethale*, id. Notes Leyd. Mus. v. p. 88, Saleyer spp. nn
Byrsia, i
rhinus. T *ibides*.
Acacalli
depres *ew species* :—

Apoderus pulchellus, Ceylon, and *macropus*, Sarawak, Pascoe, Ann. N. H. (5) xi. p. 122, & xii. p. 91; *A.* (*Cycnotrachelus*) *badeni* [admittedly shal *macrostylus*, Motsch.!], Philippines, p. 461, *A.* (*C.*) *dentipes*, East Indies, spp. 462, *A.* (*C.*?) *insularis*, p. 463, *A.* (*C.*?) *sejunctus*, Philippines, *A.* (*Centrocorynus*) *bilineatus*, Cochin China, p. 464, *A.* (*Physapoderus*) *semi-* *rufus*, Borneo, p. 465, *A.* (*P.*) *constans*, Hong Kong, p. 466, *A.* (*P.*) *hiero-* *glyphicus*, Burma, Cochin China, p. 468, *A. trinotatus*, Java, p. 469, *cal-* *catus*, Old Calabar, *fabricii*, Nyassa, Mozambique, p. 470, and *A.* (*Phy-* or depre *bus*) *dromedarius*, Zanzibar, p. 472, Faust, S. E. Z. xliv.
M. notat *labus corallipes*, Cambodia, and *indigaceus*, Laos, Pascoe, Ann. N. H.
Pseud p. 90; *A.* (*Heterolabus*) *regularis*, Faust, *l. c.* p. 471, Bahia.
to *Acall*
pore sl

Rhinomacerides.

Rhynchites clavatus, sp. n., Pascoe, Ann. N. H. (5) xi. p. 123, Ceylon.
Eugnamptus marginatus, sp. n., *id. ibid.*, Ceylon.

Scolopterides.

Ancistropterus prasinus, sp. n., Broun, N. Z. J. Sci. i. p. 435, New Zealand.

Magdalinides.

Magdalinus alpinus, Letzner, JB. schles. Ges. [illegible] p. 295. Macu[illegible]s, *M. leucopleurus*, Fairmaire, C.R. ent. Belg. [illegible] dviii[illegible]mens, spp. nn.

[illegible]ii. p. 199, Sa[illegible]cand.

[illegible] p. 199, *glabratus*, Shahrud, [illegible]raditus, Ala-Tau, p. 202, *id.*

Balaninides.

Balaninus luctuosus, p. 91, *galbula*, Dor[illegible] sar, *cuneipennis*, Tondano, p. 92, and *pro*[illegible]ia Minor, Cairo. Pascoe, Ann. N. H. (5) xii.

[illegible], Z. xxvii. p. 32, Chinchoxo ; [illegible] Piskra, Fairmaire, R. Z. [illegible]id. C.R. ent. Belg. Chron. (2) xix. p. 219.

Anthonomides.

Anthonomus pomorum, Linn. Apple Weevil noticed ; [illegible]

Sphinctocerus constrictus, Mars. (= *Aubæus lethierrii*, D[illegible]*semæ*, Pascoe, noticed ; Bedel & Bourgeois, Bull. Soc. Ent. Fr. (6) iii. p. lii. [illegible] Sula, Timo[illegible]

Orchestes, Ill. Weise disagrees with Thomson[illegible] [illegible]*rke*[illegible] [illegible]n of this genus ; Deutsche E. Z. xx[illegible] [illegible]xvii. p. 256. [illegible]ovdsk, p. [illegible]

Anthomorphus, g. n., Weise, Deutsche E. Z. xxvii. p. 255. [illegible] [illegible]ent, [illegible]omus with d[illegible]entated claws. Type, *A. varians*, P[illegible]yk., [illegible] and *leco*[illegible] [illegible], Herbst (= *ater*, Gyll.), is a synonym.

Coryssomerides.

Faust, J. Die Gruppe der *Coryssomerides*, Lac. S. E. Z. xli[illegible]*dus*, 473–487.

The characters of the genera discussed, and several new s[illegible] scribed. Only 4 genera are admitted without question : *Cory*[illegible]vii. (2) Schönh., *Metialma*, Pasc., *Euryommatus*, Roger., and *Paneptes*, [illegible]

Euryommatus nebulosus, sp. n., *id. l. c.* p. 482, Borneo. [illegible]d.

Tychiides.

Tychius venustus, Fabr. Clothing and colour-variation ; Letzner, JB. schles. Ges. lx. pp. 296–298.

Pachytychius kirschi, Tourn., = *puncticollis*, Reitt.; Reitter, Wie. ent. Z. ii. p. 96.

Tychius varicolor, sp. n., Fairmaire, R. Z. (3) vii. p. 214, Tugurt.

Cionides.

Cionus, Clairv., *Platylæmus*, Weise, and *Stereonychus*, Suffr., di[illegible] tiated ; Weise, Deutsche E. Z. xxvii. p. 215.

Nanophyes setulosus, Tourn., = 4-*virgatus*, Costa ; Brisout, Bu[illegible] Ent. Fr. (6) iii. p. xxvi. *N.* (*Sphærula*) *lythri*, Fabr : colour-vari[illegible] Silesia ; Letzner, JB. schles. Ges. lx. pp. 298–300.

Platylæmus, g. n., Weise, Deutsche E. Z. xxvii. p. 255. Allied to *Cionus* ; prosternum not indented at the tip, antennæ rather thick. To include *C. pulchellus*, Herbst, & allies.

Cionus obesus, sp. n., Pascoe, Ann. N. H. (5) xii. p. 93, Madras.

Nanophyes finitus, Sarawak, *concretus*, Macassar, p. 94, and *tarsalis*, Buru, p. 95, *id.* l. c.; *N. martini*, Brisout, Bull. Soc. Ent. Fr. (6) iii. p. xxv., Biskra: spp. nn.

Gymnetrides.

Gymnetron marmota, Algeria, and *serie-hirtus* [*-tum*], Morocco, spp. nn., Fairmaire, C.R. ent. Belg. xxvii. p. cxiv.

Alcidides.

Alcides lewisi, ruptus, curialis, p. 124, *guttulatus, suspensus*, p. 125, and *argutor*, p. 126, Pascoe, Ann. N. H. (5) xi., Ceylon; *A. griseo-lineatus* and *guessfeld*[*t*]*i*, Kolbe, B. E. Z. xxvii. p. 34, Chinchoxo: spp. nn.

Cryptorrhynchides.

Orobitis cyaneus, Linn. Larva feeds in the fruit of *Viola canina*; Schlechtendal, JB. Ver. Zwickau, 1879, p. 29.

Acalles pyrenæus, Boh., var. *germanicus* from Silesia described; Letzner, JB. schles. Ges. lx. pp. 292–295.

Cryptorrhynchus lapathi, Linn., noticed; Bignell & Hill, Ent. xvi. pp. 214 & 264.

Trichocalus longipilis, Fairmaire. Genus and species recharacterized by him; R. Z. (5) vii. p. 209.

New genera and species:—

Phrygena, Pascoe, Ann. N. H. (5) xi. p. 128. Allied to *Colobodes*, but with the pectoral canal extending to the mesosternum. Type, *P. ephippiata*, sp. n., *l. c.* p. 129, Dikoya, Ceylon; add *P. affinis*, sp. n., *l. c.* p. 129, note, Singapore.

Byrsia, id. *op. cit.* xii. p. 95. Apparently allied to *Colobodes* and *Erirrhinus*. Type, *B. cerata*, sp. n., *l. c.* p. 96, Queensland.

Acacallis, id. *l. c.* p. 96. Allied to *Orochlesis*, &c.; rostrum straight, depressed; femora canaliculate; and base of prothorax truncate. Type, *A. personata*, sp. n., *ibid.*, Queensland.

Amphialus, id. *op. cit.* xi. p. 127. Resembles *Acalles*, but with a broad shallow excavation on the short pectus. Types, *A. turgidus* and *agrestis*, spp. nn., *l. c.* pp. 127 & 128, Dikoya, Ceylon.

Strattis, id. *l. c.* p. 129. Differs from *Acalles* by the femora canaliculated below, and the distinct scutellum. Types, *S. biguttatus* and *vestigialis*, spp. nn., *l. c.* pp. 129 & 130, Dikoya, Ceylon.

Miocalles, id. *op. cit.* xii. p. 97. Allied to *Acalles*; rostrum rather broad or depressed, and tip of the prothorax produced; head concealed. Type, *M. notatus*, sp. n., *ibid.*, Aru, Mysol.

Pseudacalles, Fairmaire, Ann. Soc. Ent. Belg. xxvii. (2) p. 38. Allied to *Acalles*; intercoxal process broad, arched; antennæ with the funiculus more slender, and the first two joints (especially the second) long. Type, *P. laticritius*, sp. n., *ibid.*, Duke of York Island.

Diphilus, Pascoe, *l. c.* p. 97. *Cryptorrhynchinæ*; type, *D. squamosus*, sp. n., *l. c.* p. 98, Siam.

Osaces, Pascoe, *l. c.* p. 99. Allied to *Mormactes*; femora not grooved beneath, nor tibiæ striated. Type, *O. naso*, sp. n., *ibid.*, Port Bowen.

Ithyporus post-fasciatus, Fairmaire, Le Nat. v. p. 206, and Ann. Soc. Ent. Fr. iii. p. 108. Abyssinia.

Camptorrhinus frater, Kolbe, B. E. Z. xxvii. p. 33, Chinchoxo; *C. uniformis*, Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 38, New Britain.

Anaballus rubigineus, Duke of York Island, and *crassus*, New Britain, *id. l. c.* p. 39.

Acalles griseus, diversus, p. 436, *cingulatus*, p. 437, *scitus, latirostris*, p. 438, *decem-cristatus, triangulatus*, p. 439, and *cinereus*, p. 440, Broun, N. Z. J. Sci. i., New Zealand; *A. milleri*, Reitter, Rev. mens. Ent. i. p. 117, Caucasus.

Tychanus scabiosus, Broun, *l. c.* p. 440, New Zealand; *T. bufo*, Sharp, Ent. M. M. xx. p. 68, New Zealand.

Rhyncodes atrus, Broun, *l. c.* p. 441, New Zealand.

Dipaltosternus fairmairii, Pascoe, Ann. N. H. (5) xii. p. 98, Fiji.

Acytesta antica, id. *l. c.* p. 100, Kaioa.

Cyamobolus clavicularis, Kolbe, *l. c.* p. 35, Chinchoxo.

Euthyrrhinus brevispinosus, Fairmaire, *l. c.* p. 37, Duke of York Island.

Zygopides.

Metialma balsaminæ, Motsch., redescribed; Faust., S. E. Z. xliv. p. 484.

Sphalmus sericostatus, Fairmaire, redescribed by him; Ann. Soc. Ent. Fr. (6) iii. p. 109.

Podalia, g. n., Pascoe, Ann. N. H. (5) xi. p. 126. Allied to *Copturus*; legs short and stout; rostrum in repose not extending to the mesosternum; antennæ short; scape not extending to the eyes. Type, *P. mimica*, sp. n., *l. c.* p. 127, Galle, Ceylon.

New species :—

Telephae propola, Pascoe, Ann. N. H. (5) xii. p. 99, Sarawak.

Metialma rufirostris, Burma, p. 482, *sæva*, Darjeeling, p. 483, *ignorata*, Java, p. 485, and *pascoei*, Madagascar, p. 486, Faust. S. E. Z. xliv.

Arachnopus interruptus, Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 40, Duke of York Island.

Phanomerus piceatus, Ancey, Nat. Sicil. ii. p. 119, Abyssinia.

Coryssopus discolor, Kolbe, B. E. Z. xxvii. p. 33, Chinchoxo.

Sympiezopus tenuilineatus, Ancey, *l. c.* p. 119, Zanzibar.

Ceuthorrhynchides.

Celiodes and the allied subgenera *Chemogonus*, Lec., *Cidnorrhinus* and *Stenocarus*, Thoms., and 2 new genera noticed; Weise, Deutsche E. Z. xxvii. pp. 255 & 256.

Scleropterus and *Rhytidosomus*, Weise, differentiated by him; *l. c.* p. 256.

Ceuthorrhynchus, Germ. The blue or metallic species tabulated and described (18 species discussed in full, in addition to several others imper-

fectly known to the author; *C. suturellus*, Bach, = *obscure-cyaneus*, Gyll.; 4 species of the 18 are described as new): Weise, *l. c.* pp. 321–332.

Poophagus sisymbrii, Fabr. Transformations described; Letzner, JB. schles. Ges. lx. pp. 301 & 302.

Telenomus, Thoms., = *Phytobius*, Schönh., but *Pachyrrhinus*, Kirby, is distinct; Weise, *l. c.* p. 255.

Rhinoncus topiarius, Germ., belongs to *Marmaropus*, Schönh.; the genus is allied to *Mononychus*, Germ.: id. *l. c.* p. 256.

New genera and species :—

Cœliastes, g. n., Weise, Deutsche E. Z. xxvii. p. 256. Allied to *Cœliodes*; flagellum 6-jointed. Type, *C. lamii*, Fabr.

Allodactylus, id. *ibid.* Allied to *Cœliodes*; tibiæ with a distinct indentation set with bristles. Type, *C. geranii* Payk.

Cœliodes hoffmanni, Weise, Deutsche E. Z. xxvii. p. 219, Croatia.

Ceuthorrhynchus timidus, Dalmatia, Croatia, Caucasus, p. 325, *obesulus*, Andalusia, *granipennis*, Greece, p. 326, and *pervicax*, Sommerfeld, p. 331, *id.* l. c.; *C. kuthii*, Frivaldsky, Term. füzetek, vii. p. 13, Hungary; *C. ragusæ*, Brisout, Nat. Sicil. iii. p. 61, Sicily, Naples; *C. piceolatus*, Samara, p. 113, *notatus*, p. 114, *affinis*, West Siberia, *æneipennis*, p. 115, *dubius*, South Russia p. 116, *seniculus*, Dauria, p. 117, *rufimanus*, Astrakan, p. 118, and *fausti*, Baikal, p. 119, Brisout, Ann. Soc. Ent. Fr. (6) iii.

Baridiides.

Baris, Germ. Various species noticed; Buysson, Bull. Soc. Ent. Fr. (6) iii. p. lxxiv. *B. morio*, Schönh. (= *resedæ*, Bach): life-history; Buddeberg, JB. nass. Ver. xxxvi. pp. 130–133, pl. ii. figs. 4–7.

Hypocentrinus, g. n., Kolbe, B. E. Z. xxvii. p. 34. Allied to *Centrinus*. Type, *H. ignobilis*, sp. n., *l. c.* p. 35, Chinchoxo.

Acythopeus luxatus, sp. n., Pascoe, Ann. N. H. (5) xii. p. 100, Labuan.

Calandrides.

STIERLIN, G. Tableaux dichotomiques des *Sphenophorus* et *Tropiphorus* d'Europe et circa. Rev. d'Ent. ii. pp. 60–64. (Translated from MT. schw. ent. Ges. 1880 & 1882 by F. Reiber.)

Rhynchophorus relutinus, Fairm., = *kaupi*, Schauf.; Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 40.

Sphenophorus, Stierl. Reitter, Deutsche E. Z. xxvii. pp. 231 & 235, discusses and tabulates the European and Algerian species; he admits 8, as follows :—*S. piceus*, Pall. (= *opacus*, Stierl.). *parumpunctatus*, Schönh., *striato-punctatus*, sp. n., *opacus*, Schönh. (= *siculus*, Stierl.), *abbreviatus*, Fabr. (= *ragusæ*, Stierl., and *inæqualis*, All.), *mutilatus*, Laich. (= *helveticus*, Stierl.), *pumilus*, All., and *meridionalis*, Gyll. (= *uniseriatus*, Stierl.). *S. insularis*, Boh., = *obscurus*, Boisd.; Fairmaire, *l. c.* p. 41. *S. sculptilis*, Uhler, and some allied species, discussed; Lintner, Rep. Ins. N. Y. i. pp. 253–263, fig. 76.

Macrochirus spectabilis, sp. n., Dohrn, S. E. Z. xliv. pp. 362 & 397, fig., Nias.

Protocerius æmulus, sp. n., *id. l. c.* p. 159, Nias.

Sphenophorus simillimus and *subulirostris*, Kolbe, B. E. Z. xxvii. p. 35, Chinchoxo; *S. striato-punctatus*, Reitter, Deutsche E. Z. xxvii. p. 234, Algeria: spp. nn.

Eugnoristus niger, sp. n., Pascoe, Ann. N. H. (5) xii. p. 100, Madagascar.

Sipalides.

Sipalus squalidus, sp. n., Kolbe, B. E. Z. xxvii. p. 35, Chinchoxo.

Cossonides.

Revised list of New Zealand species; Broun, N. Z. J. Sci. i. pp. 487 & 488.

Rhyncolus ater, Linn., noticed as injurious to pine; Letzner, JB. schles. Ges. lx. pp. 302–304.

Novitas nigrans, Broun, figured; Waterhouse, Aid, ii. pl. cxxxviii. fig. 4.

New genera and species :—

Rhinanisus, Broun, N. Z. J. Sci. i. p. 489. Allied to *Pentarthrum*; rostrum narrower behind the antennal insertion; eyes smaller, less convex, and form rather broad and subdepressed. To include *P. fulvicornis* (type), *parvicornis*, and *contiguus*, Broun.

Diædimorpha, id. *ibid.* Allied to *Pentarthrum*. Types, *P. wollastonianum* and *debile*, Broun.

Agastegnus, id. *l. c.* p. 490. Allied to *Pentarthrum* and *Sericotrogus*. Type, *A. ruficollis*, sp. n., *ibid.*, New Zealand; will also include *P. gratus* and *longipes*, Broun, and perhaps *S. simulans*, Sharp.

Bœorhopalus, id. *l. c.* p. 491. Allied to *Macroscytalus*. Type, *M. glabrus*, Broun.

Proconus, id. *l. c.* p. 492. Allied to *Heteropsis*. Type, *Pentarthrum asperirostris*, Broun.

Eudontus, id. *l. c.* Intermediate between *Pogonorrhinus* and *Arecophaga*; rostrum as in the latter, but not ciliated. Type, *E. punctithorax*, sp. n., *ibid.*, New Zealand.

Pentarthrum ferrugineum and *crenatum*, id. *l. c.* pp. 488 & 489, New Zealand.

Amaurorrhinus genuensis, Genoa, *lostiæ*, Cagliari, and *coquereli*, Oran, Fairmaire, Ann. Mus. Genov. xviii. p. 757.

Macroscytalus depressus, Broun, N. Z. J. Sci. i. p. 491, New Zealand.

Scolytidæ.

Eichhoff, W. Les Xylophages d'Europe. Tableaux traduits de l'allemand par A. Dubois, avec des notes et additions concernant la faune gallo-rhénane, par A. Fauvel. Rev. d'Ent. ii. pp. 97–117 & 120–147, pls. ii. & iii.

Lindeman, K. *Tomicus typographus* und *Agaricus melleus* als Verbündete im Kampfe mit der Fichte. Bull. Mosc. lvii. (2) pp. 189–194. (Abstract: Karsch, Biol. Centralbl. iii. p. 414.)

Phlœosinus thuiæ, Perris, and *Thamnurgus kaltenbachi*, Bach. Life-histories; Buddeberg, JB. nass. Ver. xxxvi. pp. 133–140, pl. ii. figs. 8–12.

Hylurgops pinifex, Fitch, and *Xyloborus cælatus*, Eich. Embryology described and figured; Packard, Rep. U. S. Ent. Comm. iii. pp. 280–282, pl. xxii.

Hylurgus micklitzi, Wachtl, noticed from Oran; Fairmaire, C.R. ent. Belg. xxvii. p. cxiv.

Hylesinus oleiperda, Fabr., discussed, and galleries figured; Bellevoye, Bull. Soc. Metz (2) xiv. pp. 171–180 [1876].

Corthylus punctatissimus, Zimm., destructive to sugar-maple; Merriam, Am. Nat. xvii. pp. 84–86, woodcuts.

New species:—

Hylastes batnensis, Brisout, Rev. d'Ent. ii. p. 146, Algeria.

Phlœosinus cedri, id. *ibid.*, Algeria.

Phlœophthorus spinulosus, Rey, Rev. d'Ent. ii. p. 127, note, Switzerland.

Xyloborus subdepressus, id. *l. c.* p. 142, note, Lyons.

Thamnurgus scrutator, Pandellé, Rev. d'Ent. ii. p. 130, note, Pyrenees.

Scolytus numidicus, Brisout, *l. c.* p. 147, Algeria.

Brenthidæ.

Lewis, G. On Japan *Brenthidæ*, and notes of their habits. J. L. S. xvii. pp. 295–302, pl. xii.

Only 6 species noticed (mostly new), but the remarks on habits, distribution, &c., are important; a 7th species, *Trachelizus bisulcatus*, Lund, is regarded as doubtful.

Baryrrhynchus poweri, Roel., noticed and figured; *id. l. c.* p. 300, pl. xii. fig. 11.

Eupsalis minuta, Dru. The forceps of the ♂ said to be used for extracting the proboscis [? ovipositor] of the ♀ from the bark of a tree after oviposition [!]; Hamilton & Holland, Bull. Brooklyn Soc. vi. p. 46.

Ectocemus ruficauda, Bates, = *decem-maculatus*, Montr., and *E. spini-pennis*, Fairm., = *pogonocerus*, Montr.; Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 42.

Centrophorus, Chevr. Monograph; Kolbe, S. E. Z. xliv. pp. 381–388. The known species are as follows:—*C. dives*, Chevr., *nigrita*, Klug, *encaustus*, Boh., *picicornis*, *atratus*, Klug, and *dives*, Lac. (with varr. *cylindricus* and *striato-punctatus*). *C. metallicus*, Chevr., probably = *Ameristus cavicaudatus*, Chevr.; *C. striatulus*, Oliv., is a doubtful species.

New genera and species:—

Anchisteus, Kolbe, B. E. Z. xxvii. p. 185. *Hephebocerini*; type, *A. peregrinus*, sp. n., *l. c.* p. 186, Madagascar.

Higonius, Lewis, J. L. S. xvii. p. 299. Allied to *Cerobates*. To include *H. poweri*, Penang, p. 299, note, *cilo*, pl. xii. figs. 9 & 10, Japan, p. 300, and *H. crux*, Olliff, *op. cit.* p. 300, note, S. Andamans, spp. nn.

Pericordus, Kolbe, S. E. Z. xliv. p. 237. Allied to *Cordus* and *Symmorphocerus*. Type, *P. latipes*, sp. n., *l. c.* p. 238, Congo.

Bothrior[*r*]*hinus*, Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 42. Allied to *Amorphocephalus*. Type, *H. costulipennis*, sp. n., *ibid.*, Duke of York Island.

Zemioses celtis, Lewis, J. L. S. xvii. p. 296, pl. xii. figs. 1, 7, & 8, Japan.

Cyphagogus signipes, id. *l. c.* p. 297, pl. xii. figs. 2, 3, & 4, Japan.

Anisognathus mechowi and *anaticeps*, Kolbe, S. E. Z. xliv. pp. 234 & 235, Congo.

Ionthocerus nigripes, Lewis, *l. c.* p. 298, pl. xii. figs. 5 & 6, Japan.

Baryrrhynchus indocilis, Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 41, Duke of York Island.

Eupsalis submaculatus, Kolbe, *l. c.* p. 238, Congo.

Orychodes insignis, Lewis, *l. c.* p. 301, pl. xii. fig. 12, Japan.

Rhinopteryx errans, Kolbe, B. E. Z. xxvii. p. 36, Chinchoxo.

Centrophorus assiduus, p. 382, *validirostris*, p. 383, *rectirostris*, p. 385, and *aneolus*, p. 387, *id.* S. E. Z. xliv., Madagascar.

Schizotrachelus schmeltzi, Fairmaire, *l. c.* p. 44, Duke of York Island.

Anthotribidæ.

Xylinades affinis, Chevr., MS., = *marmoratus* (Dej.), Roel.; *X. chevrolati*, Dej., and *westermanni*, Schönh., differentiated; *X. lanugi*[*ni*]*cornis*, Dalm., quoted as *lanuginosus* by authors; *X. pertii*, Fåhr., = *atricornis*, Labr. & Imh., = *funereus*, Dej.; *X. atricornis*, Fabr., seems closely allied to *maculipes*, Fåhr.; *X. tuberculosus*, Motsch., = *rugicollis*, Fåhr. [also ? = *geminatus*, Chevr. (MS. ?), and *robustus*, Jek., MS.]: Ritsema, Notes Leyd. Mus. v. pp. 7 & 8. *X. rufo-pictus*, Fairmaire, redescribed by him; Ann. Soc. Ent. Fr. (6) iii. p. 109.

Exilis spectabilis, Broun, figured; Waterhouse, Aid, ii. pl. cxxxviii. figs. 7 & 8.

Aræocerus fasciculatus, Deg. (= *coffeæ*, Fabr.). Occurrence in Breslau noticed; Letzner, JB. schles. Ges. lx. p. 308.

Tophoderes hildebrandti, sp. n., Dohrn, S. E. Z. xliv. p. 157, Madagascar.

Nessiara deplanata, sp. n., Fairmaire, Ann. Ent Belg. xxvii. (2) p. 45, Duke of York Island.

Xenocerus luctificus, sp. n., *id. ibid.*, Duke of York Island.

Phanotherion steindachneri, sp. n., Frivaldszky. Wien. ent. Z. ii. p. 36, Beyrut.

Bruchidæ.

Urodon conformis, Suffr. Life-history; Buddeberg, JB. nass. Ver. xxxvi pp. 140–143, pl. ii. figs. 13–17.

Bruchus. Allard, Ann. Soc. Ent. Belg. xxvii. (1) pp. 7–13, redescribes *B. longicornis*, Germ., *histrio*, and *jocosus*, Schönh., *serraticornis*, Fabr., *quinqueguttatus*, Oliv., *discipennis*, Chevr., and *incarnatus*, Schönh. *B. albo-sparsus*, Fåhr., redescribed; Fairmaire, R. Z. (3) vii. p. 207.

Bruchus fulvus, Egypt, p. 5, *sordidatus*, Spain, *rufisura*, Syria, p. 6, *algiricus*, Algeria, p. 9, *albo-pictus*, Jaffa, Nazareth, p. 11, and *leucophæus* (= *fœlutinus*, All., *olim*), Damascus, Lebanon, p. 12, spp. nn., Allard, *l. c.*

Cerambycidæ.

Quedenfeldt, G. Verzeichniss der von Falkenstein in Chinchoxo (West-Afrika, nördlich der Congomündungen) gesammelten Longicornen des Berliner königlichen Museums. B. E. Z. xxvii. pp. 131–146, pl. i.

47 species enumerated, 12 new.

Additions to and corrections in the Munich Catalogue of *Cerambycidæ*; Lameere, C.R. ent. Belg. xxvii. pp. civ. & cv.

List of Longicorns captured at Grande-Chartreuse; Michard, Feuill. Nat. iii. p. 101.

Undetermined Longicorn larva destructive to *Dendrobium*; Westwood, Gard. Chron. (2) xix. p. 144.

The larvæ of the following *Cerambycidæ* are noticed as destructive to forest trees in N. America (Packard, Rep. U. S. Ent. Comm. iii. pp. 256–262):—*Acemum mœstum*, Hald., pl. ix. fig. 1, *Elaphidion parallelum*, Newm., pl. vii. fig. 1, *Xylotrechus colonus*, Fabr., pl. xii. figs. 2 & 2*a*, *Rhagium lineatum*, Oliv., pl. xi. figs. 1 & 2, *Orthosoma brunneum*, De Geer, pl. x. fig. 1, and several undetermined larvæ figured on pls. x.–xii.

Prionides.

Sypilus venturæ, Dohrn (questioned by Berg as distinct from *orbignii*, Guér., *cf.* p. 392), is a good species; Dohrn, S. E. Z. xliv. p. 428.

Hypocephalus armatus, Desm., noticed; Lacerda, Le Nat. v. pp. 328 & 336.

Cerambycides.

Dohrn notices *Rhytidodera bowringi*, White, *Xestia spinipennis*, Serv., *Pachylocerus crassicornis*, Oliv., *Logisticus rostratus*, Waterh., *Eburia octo-guttata*, Gérm., *Phœnicus sanguinipennis*, Lac. (redescribed), and *Trachyderes sulcatus*, Burm.; S. E. Z. xliv. pp. 156–160, 364, 397, & 495.

Clytus pantherinus, Saven., *Pachyta marginata* and *Gracilia pygmæa*, Fabr. Occurrence in Finland noticed; Sahlberg & Bonsdorff, Medd. Fenn. ix. pp. 87, 88, 125, & 150.

Cerambyx heros and *cerdo* noticed; Hall, Ent. xvi. pp. 23 & 24.

Elaphidion villosum, Fabr., boring into twigs of *Wistaria*; Read, Bull. Cyrs. Agric. Ent. ii. p. 30.

lineatum sp. found near Bamberg to be infested by mites; Haupt, Ber. phantaberg, 1883 (*cf.* Bull. Ent. Ital. xv. pp. 210 & 211).

hand *pom indagator*, Fabr., noticed; Bargagli, Bull. Ent. Ital. xv. pp. [illegible] & 166.

Pachyta interrogationis. Variations in colour of elytra described; F. & H. Müller, Kosmos, xiii. pp. 32–36, figs.

Acmæops pratensis, Laich., entering the human ear; Harrington, Canad. Ent. xv. pp. 59 & 60.

Molorchus minimus, Scop., var. *schmidti* from Galicia described; Ganglbauer, Wien. ent. Z. ii. p. 300.

Closteriomerus raffrayi, Fairmaire, redescribed by him; Ann. Soc. Ent. Fr. (6) iii. p. 110.

Callidium nicolas and *subfasciellum*, White, = *Hylotrupes ligneus* and *Phymatodes varius*, Fabr., respectively; Horn, Tr. Am. Ent. Soc. x. p. 289.

Rhopalopus hungaricus, Herbst, *insubricus*, Germ., and *siculus*, Stierl., are probably varieties; Puton, Rev. d'Ent. ii. pp. 91-93.

Clytus (*Elezira*) *balyi*, Pascoe, figured; Waterhouse, Aid, ii. pl. cxxxiii. fig. 5.

Microclytus gazellula, Hald. On the tenacity of life of this species; *cf.* Reinecke, Bull. Brooklyn Soc. vi. p. 36.

Xylotrechus annosus, Say, bred; Coquillet, Canad. Ent. xv. pp. 31 & 32.

Vesperus xatarti, Muls. Abstract of Oliver's observations on its transformations; Rey, Ann. Soc. L. Lyon, xxix. pp. 138–140.

New genera and species :—

Ptychopterus, Broun, N. Z. J. Sci. p. 493. Placed after *Didymocantha*. Type, *D. simpliceps*, which is renamed *P. rugosus*, and redescribed, *l. c.* p. 494.

Omoptycha, Quedenfeldt, B. E. Z. xxvii. p. 132. Allied to *Zonopterus* and *Dictator*. Type, *O. falkensteini*, sp. n., *l. c.* p. 133, pl. i. fig. 2, Chinchoxo.

Xystrocera nitidicollis, Quedenfeldt, B. E. Z. xxvii. p. 131, Chinchoxo.

Hesperophanes kotschii, Ganglbauer, Wien. ent. Z. ii. p. 300, Cilicia.

Cordylomera karschi, Quedenfeldt, *l. c.* p 144, pl. i. fig. 10, Lunda.

Didymocantha clavipes, Broun, N. Z. J. Sci. i. p. 493, New Zealand.

Ceresium validipes and *vitticolle*, Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 46, New Britain.

Gracilia approximata, id. C.R. ent. Belg. xxvii. p. clix., Biskra.

Stenhomalus ocellatus, Quedenfeldt, *l. c.* p. 131, pl. i. fig. 1, Chinchoxo.

Callichroma fucosum, id. *l. c.* p. 134, pl. i. fig. 3, Chinchoxo.

Eulitopus seminitidus, id. *l. c.* p. 135, Chinchoxo.

Rhopalizus buchneri, id *l. c.* p. 143, pl. i. fig. 9, Lunda.

Euporus illæsicollis, id *ibid.*, Lunda.

Callidium asperipenne, Fairmaire, R. Z. (3) vii. p. 217, Tangiers.

Clytus (*Xylotrechus*) *variicollis*, id. Ann. Ent. Belg. xxvii. (2) p. 52, Duke of York Island.

Xylotrechus reichenowi, Quedenfeldt, *l. c.* p. 137, pl. i. fig. 4, Ch[illegible]xo.

Lamiides.

[illegible]nass. Wer.

Saperda sulphurata, Gebl., is a *Menesia*; *S. carinata*, Bless., = [illegible]descri[illegible]-*punctata*, Motsch.; *S. vittigera*, Fabr., = *Phytœcia* (*Conizonia*) [illegible]*ata*, Fabr.; *Oberea melanura*, Gebl., = *pedemontana*, Chevr.; *Phytœcia orbicollis*, Reiche, = *fumigata*, Küst., = *Helladia flavescens*, Brullé; *P. sim-*

plonica, Stierl., = *cylindrica*, Linn. ; and *P. kotschii*, Hampe, = *Mallosia mirabilis*, Fald. : Ganglbauer, Wien. ent. Z. ii. pp. 216 & 280.

Dorcadion, Dalm. Several species have a black form : *D. atrum*, Ill., is that of *fuliginator*, Linn. ; *D. anthracinum*, Chevr., that of *perezi*, Graells; *D. encaustum*, Chevr., that of *hispanicum*, Muls. ; *D. ovale*, Chevr., that of *graellsi*, Graells ; and *D. suturale*, Chevr., has an unnamed black form : Von Heyden, Deutsche E. Z. xxvii. p. 367. *D. atrum*, Ill., differentiated from the variable *D. fuliginator*, Linn. ; Gutheil, Ent. Nachr. ix. pp. 154 & 155. *D. carinatum*, Pall. : habits and transformations described ; it is injurious to wheat in Russia : Lindeman, Bull. Mosc. lviii. (1) pp. 157–163.

Lamia modesta, Gyll., redescribed and figured ; Ganglbauer, *l. c.* p. 298, pl. iv. fig. 1.

Lamia (*Phryneta*) *mamillata*, Dalm., noticed ; Dohrn, S. E. Z. xliv. pp. 104 & 105.

Tragocephala opulenta, Har., noticed and figured; Quedenfeldt, B. E. Z. xxvii. p. 138, pl. i. fig. 5.

Ceroplesis atropos, Fairmaire, redescribed by him ; Ann. Soc. Ent. Fr. (6) iii. p. 111.

Liopus dorsalis, White, is a *Lepturges* from Brazil ; Horn, Tr. Am. Ent. Soc. x. p. 289.

Exocentrus lusitanicus, Linn., noticed and figured; Ganglbauer, *l. c.* p. 299, note, & pl. iv. figs. 2 & 2*a*.

Colobothea picta, Montr., = *montrouzieri*, Fairm. ; Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 53.

Glenea adelia, coris, detrita, eclectica, concinnata, honora, tringaria, and *extensa*, Pascoe, figured ; Waterhouse, Aid. ii. pl. cxxx. figs. 1–8.

Oberea erythrocephala, Fabr. Transformations described; Xambeu, Ann. Soc. L. Lyon, xxix. pp. 133–135.

Philicus, g. n., Pascoe, Notes Leyd. Mus. v. p. 89. Allied to *Diallus* and *Cereopsius*. Type, *P. dialloides*, sp. n., *l. c.* p. 90, Saleyer.

New species :—

Microlamia æmula, Broun, N. Z. J. Sci. i. p. 494, New Zealand.

Somatidia crassipes and *elongata*, id. *l. c.* p. 495, New Zealand.

Hybolasius brevicollis, picitarsis, and *pusillus*, id. *l. c.* p. 496, New Zealand.

Diochares basigranatus, Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 51, New Britain.

Cereopsius niassensis, Lansberge, Notes Leyd. Mus. v. p. 24, Nias.

Batocera lactiflua, Fairmaire, *l. c.* p. 50, New Britain.

Cyphonotos intermissa, Pascoe, Notes Leyd. Mus. v. p. 89, Saleyer ; *C. hieroglyphica*, Taschenberg, Z. Naturw. lvi. p. 179, Socotra ; *C. pyrausta*, Cyrtotrachelus lineatus, Fairmaire, Le Nat. v. p. 365, Madagascar.

Cyrtotrachelus unicolor, Quedenfeldt, B. E. Z. xxvii. p. 138, pl. i. fig. 6, Chinchoxo.

Elephanta, and *Pimetes haroldi*, id. *l. c.* p. 139, pl. i. fig. 7, Chinchoxo.

Theticus bisbinodulus, id. *l. c.* p. 140, pl. i. fig. 8, Chinchoxo.

Nonyma (?) *guineensis*, id. *l. c.* p. 141, Chinchoxo.

Dichostates costiger, Quedenfeldt, *l. c.* p. 145, Lunda.
Apomecyna trifasciata, id. *l. c.* p. 141, Chinchoxo.
Nupserha bis-bi-oculata, id. *l. c.* p. 142, Chinchoxo.
Exocentrus stierlini, Ganglbauer, Wien. ent. Z. ii. p. 298, pl. iv. figs. 3 & 3 *a*, Europe.
Glenea fusco-virgata, Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 53, New Britain.
Phytœcia volgensis (Kinderm., MS.), Kraatz, Wien. ent. Z. ii. p. 276, Volga.

Chrysomelidæ.

Harrington, W. H. *Chrysomelidæ*—Leaf-eaters. Rep. E. Soc. Ont. 1882, pp. 53–62, figs. 56–74.

A popular article, with descriptions and figures of representative Canadian species.

Jacoby, M. Biologia Centrali-Americana [*cf.* Godman & Salvin, *Insecta*, General Subject]. *Coleoptera*, vol. vi. pt. 1, pp. 225–264, pls. xii.–xv.

Extends from *Stilodes* to *Diphaulaca*.

Marseul, S. A. de. Monographie des Chrysomélides de l'Ancien-Monde. L'Ab. xxi. pp. 1–72.

Extends to *Timarcha*.

Weise, J. Bemerkungen über Chrysomeliden. Deutsche E. Z. xxvii. pp. 251–254.

Relates to *Orsodacna lineola* var. *croatica*, *Crioceris macilenta* var. *simoni*, *Hydrothassa hannoverana*, Fabr., and varr. *potentillæ*, Herbst, and *calthæ* and *germanica*, Weise, *Prasocuris phellandrii*, Linn., varr. *sii* and *cicutæ*, Weise, *Stylosomus depilis*, Abeille, *Mniophila wroblewskii*, Wank., *Apteropoda globosa*, Ill., *Chrysomela gœttingensis*, Linn., var. *polonica*, *Pachybrachys haliciensis*, Mill., var. *rufimanus*, *Colaphus pulchellus*, Luc., and an allied new species.

Donaciides.

Plateumaris sericea, Linn., *discolor*, Panz., and their varieties noticed; Von Heyden, Deutsche E. Z. xxvii. p. 209.

Criocerides.

Lema coromandeliana, Fabr., var. from Saleyer noticed; Jacoby, Notes Leyd. Mus. v. p. 199.

Crioceris asparagi, Linn., discussed; Lintner, Rep. Ins. N. [illegible]op. 239–246, figs. 70–72. *C. 12-punctata*, Linn., introduced into Amhass. Vic. destructive to asparagus; Am. Nat. xvii. p. 199.

Macrodema, Baly, discussed; its proper place is certainly [illegible]descri[illegible]n *Brachydactyla* and *Lema*: Jacoby, S. E. Z. xliv. pp. 125–127.

Lema subcylindrica and *quinque-plagiata*, spp. nn., Jacoby, Notes Leyd. Mus. v. pp. 197 & 198, Saleyer.

modellithrides.

E. M. *Synandrophthalma transylvanica*, sp. n., Frivaldszky, Term. füzetek, vii. p. 14, Transylvania.

Chlamydides.

Chlamys pilifrons, sp. n., Gounelle, Bull. Soc. Ent. Fr. (6) ii. p. lxii., India.

Cryptocephalides.

Rey, C. Revision des genres *Disopus*, *Pachybrachys*, et *Stylosomus*. Rev. d'Ent. ii. pp. 257–285, 289–306, & 313–326.

Virtually a monograph of the French species. The numbers admitted are as follow:—*Disopus* (1), *Pachybrachys* (divided into 3 subgenera, 16), and *Stylosomus* (6).

New genera and species:—

Chloropachys, Rey, *l. c.* pp. 263 & 264. Subgenus of *Pachybrachys*; distinguished by its metallic blue or green colour. Type, *P. azureus*, Suffr.

Pachystylus, id. *l. c.* pp. 263 & 296. Subgenus of *Pachybrachys*, from which it differs by the finer punctuation of the prothorax, the more regular punctuation of the elytra, &c. To include *P. fimbriolatus*, *cinctus*, Suffr., *pradensis*, Mars., *scriptus*, Herr.-Schäff., and *testaceus*, Perris.

Cryptocephalus carpathicus (= *ocellatus*, Drap., var. *b* ♀, Weise), p. 15, *weisii*, p. 16, and *eurina*, p. 17, Frivaldsky, Term. füzetek, vii., Hungary; *C. molossus*, Fairmaire, R. Z. (3) vii. p. 217, Morocco; *C. quadriplagiatus*, Jacoby, Notes Leyd. Mus. v. p. 199, Saleyer.

Pachybrachys apicalis, p. 272, and *exclusus*, Hyères, &c., p. 273, *libanicola* (Abeille, MS.), Lebanon, and *coquereli* (Fairm., MS.), Lambessa, p. 304, note, Rey, *l. c.*

Stylosomus corsicus (Abeille, MS.), *id. l. c.* p. 319, Corsica.

Eumolpides.

Colaspis tristis injurious to pear and peach trees; Schwarz, Am. Nat. xvii. p. 978.

Peniticus robustus, Broun, figured; Waterhouse, Aid, ii. pl. cxxxviii. fig. 5.

Iphimoides, g. n., Jacoby, Notes Leyd. Mus. v. p. 200. Distinguished from *Iphimela* by the truncate prosternum, and from *Colaspoides* by the *Cyrtonota*-like thoracic episternum. Type, *I. celebensis*, sp. n., *l. c.* p. 201, *Iphimela lineatus*, Jacoby.

Iphimela, sma cupreo-cyanea [*-neum*], sp. n., Fairmaire, Ann. Ent. Belg. xx. (and *par*) p. 54, Duke of York Island.

Pseudocolaspis fulgidipes, sp. n., Ancey, Nat. Sicil. ii. p. 120, Abyssinia.

Syagrus bipunctatus, *rufipes*, *auratus*, Ashanti, p. 335, *simoni*, Addah, and *mechowi*, Quango, p. 336, spp. nn., Weise, Deutsche E. Z. xxvii.

Chrysomelides.

Fairmaire, L. Notes complémentaires sur le genre *Cyrtonus*. An. S. Esp. xii. pp. 251–271. 3

35 species added to Fairmaire's Monograph in Ann. Soc. Ent. Fr. 1850.

Weise, J. Bemerkungen über die im Glatzer Gebirge lebenden *Orina*-Arten und ihre Larven. Deutsche E. Z. xxvii. pp. 210–218.

The following species and their varieties are noticed :—*O. intricata*, Germ., *alpestris*, Schumm., *decora*, Richt., *alcyonea*, Suffr., *speciosissima*, Scop., and *senecionis*, Schumm. A revised list of species and varieties is added.

Jacoby, Biol. Centr. Am. *Col.* vi. (1), figures or specially notices the following known species :—*Stilodes fusco-lineata*, Stål (= *chapuisi*, Jac.), pl. xiii. fig. 3, *Leptinotarsa casica*, Stål, pl. xiv. fig. 23, *chalcospila*, Stål, fig. 9, *lacerata*, Stål, fig. 10, *heydeni*, Stål, fig. 11, *zetterstedti*, Stål, fig. 19, *dilecta*, Stål, fig. 16, pl. xiii., *novemlineata*, Stål, *flavitarsis*, Guér. (= *signatipennis*, Baly), pl. xiv. fig. 12, *nitidicollis*, Stål, *calceata*, Stål (= *vittata*, Baly), fig. 14, *obliterata*, Chevr. (= *subnotata*, Stål), fig. 15, *pudica*, Stål, fig. 25, *signaticollis*, Stål, fig. 20, *decemlineata*, Say (= *multilineata*, Stål), fig. 24, *multitæniata*, Stål, *undecemlineata*, Stål, *defecta*, Stål, fig. 21, *melanothorax*, Stål, fig. 22, *dahlbomi*, Stål, fig. 23, *haldemani*, Rog., *flavo-pustulata*, Stål, fig. 17, *belti*, Jac., fig. 18, pl. xiii., *evanescens*, Stål, pl. xv. fig. 2, *distinguenda*, Jac., pl. xiv. fig. 25 ; *Labidomera suturella*, Chevr., pl. xv. figs. 5 & 6 ; *Doryphora paykulli*, fig. 16, *biremis*, *petulans*, fig. 15, *insignicornis*, fig. 7, pl. xiv., *semiambita*, Stål, pl. xv. fig. 7, *bicolor*, Jac., pl. xiv. fig. 5, *bella*, Baly (= *tricincta*, Stål), fig. 9, *mirabilis*, fig. 14, pl. xv., *spectanda*, fig. 7, *decemstillata*, Stål, fig. 21, pl. xiv., *princeps*, Gray (= *magnifica*, Stål, and *superba*, Perty), *æneo-ornata*, fig. 12, *diagonalis*, Stål, fig. 13, pl. xv., *decorata*, fig. 11, *ornata*, fig. 9, *ocellata*, Jac., fig. 4, pl. xiv. (= *D. transverso-plagiata*, pl. xv. fig. 19), *sheppardi*, Baly (= *divisa*, Stål), *impar*, Stål, fig. 10, *decens*, *eucosma*, *sallæi*, Stål, fig. 14, *salvini*, Baly, fig. 6, *arangoi*, Steinh., *flavo-guttata*, fig. 2, *bis-bimaculata*, fig. 8, pl. xiv., *antennalis*, pl. xv., fig. 18, *dorso-maculata*, fig. 1, *punctipennis*, Jac., *ligata*, Stål, fig. 13, *spectabilis*, Baly, fig. 19, pl. xiv. ; *Desmogramma conjugata* and *Elytrosphæra aciculata*, Stål.

Coquillett, Canad. Ent. xv. pp. 21–23, describes the larvæ of *Chrysomela pallida*, Say, *clivicollis*, Kirby, *Doryphora 10-lineata*, Say, *juncta*, Germ., *C. multiguttis*, Stål, *bigsbiana*, Kirby, *similis*, Rogers, and *Lema collaris*, Say.

Gastrophysa raphani, Herbst. Parthenogenesis noticed ; McLachlan, P. L. S. 1880–82, pp. 21 & 22.

Plagiodera scripta, Fabr. Transformations described ; Osborn, Trans. Kansas Ac. iv. [1875] pp. 24 & 25.

Chrysomela menthastri, Suffr : black variety noticed ; Bellier-de-la-Chavignerie, Feuill. Nat. iv. p. 10. *C.* (*Doryphora*) *hybrida*, Jacoby, var. *basinotata* from Peru described, and *C.* (*D.*) *aulica*, Oliv., noticed from Ecuador ; Kirsch, B. E. Z. xxvii. pp. 188 & 189. *C.* (*Leptinotarsa*)

modesta, Jac. (= *ærea*, Dugès): transformations described and figured; E. Dugès, Ann. Ent. Belg. xxvii. (1) pp. 144–148, pl. iv.A.

Orina, Chevr. Species tabulated, pp. 248–250; 9 Swiss species discussed, including *O. pretiosa*, Suffr. (with varr. *variabilis* and *balcanica*), which is differentiated from *gloriosa*, Fabr., and fully described, pp. 243–247: Weise, Deutsche E. Z. xxvii.

Leptinotarsa decemlineata. Great diminution in numbers in 1882 & 1883; Claypole, Am. Nat. xvii. pp. 1174 & 1175. Observations on living specimens; C. C. H. Müller, Zool. Gart. xxiv. pp. 346–348.

Doryphora militaris, *insulana*, *fulvicollis*, and *fulvo-notata*, Jacoby, figured; Waterhouse, Aid, ii. pl. cxxix. figs. 3–6.

Timarcha rugosa, Linn., var. *kobelti* from Oran described; Von Heyden, Ber. senck. Ges. 1882–83, p. 221.

New species:—

Colaphus tenuipes, Weise, Deutsche E. Z. xxvii. p. 254, Morocco.

Chrysomela solata, Fairmaire, R. Z. (3) vii. p. 218, Bou-Saada *C.* (*Doryphora*) *puncticollis*, p. 187, *C.* (*Elytrosphæra*) *jacobii*, fig. 9, *C.* (*Prosicela*) *antennalis*, Ecuador, p. 189, *C.* (*P.*) *tarsalis*, New Granada, *C.* (*Desmogramma*) *rufo-fasciata*, p. 190, *C.* (*D.*) *senilis*, p. 191, and *C.* (*Elytrosphæra*) *nivalis*, fig. 8, pl. ii., Ecuador, p. 192, Kirsch, B. E. Z., xxvii.

Stilodes leoparda, fig. 6, Nicaragua, Panama, *panamensis*, *stali*, fig. 5, Panama, p. 225, and *pallidipennis*, fig. 7, p. 226, Mexico, Jacoby, Biol. Centr. Am. *Col.* vi. (1) pl. xiii.

Leptinotarsa puncticollis, fig. 12, p. 228, *modesta*, fig. 13, pl. xiii., p. 229, *stali*, fig. 1, p. 237, *dohrni*, fig. 4, p. 239, and *hægii*, fig. 3, pl. xv. p. 240, *id. l. c.*, Mexico.

Prosicela tibialis, pl. xv. fig. 25, Mexico, and *brevicollis*, Guatemala, *id. l. c.* pp. 241 & 242.

Doryphora panamensis, fig. 11, Panama, p. 244, *pallidicornis*, Guatemala, *subfastuosa*, British Honduras, Guatemala, p. 245, *purulensis*, fig. 8, p. 246, *lativittis*, fig. 10, p. 247, *marginalis*, fig. 15, Guatemala, p. 248, *chontalensis*, fig. 17, pl. xv., Nicaragua, p. 252, *biplagata*, p. 253, *geometra*, Panama, *rogersi* (= 12-*gûttata*, pl. xiv. fig. 20), Costa Rica, p. 254, *boucardi*, fig. 20, *opposita*, fig. 21, p. 256, *uniformis*, Panama, p. 257, *viridifasciata*, fig. 16, pl. xv., Mexico, Guatemala, p. 258, and *clarki*, Panama, p. 259, *id. l. c.*

Elytrosphæra quadrimaculata, fig. 22, p. 260, *mexicana*, fig. 23, Mexico, p. 261, and *annulata*, fig. 24, Mexico, p. 262, *id. l. c.* pl. xv.

Timarcha leseleuci, p. 62, and *pontovicii*, p. 67, Marseul, L'Ab. xxi., Spain.

Cyrtonus major, p. 252, *pazi*, Alicante, *conformis*, Ronda, p. 254, *dorsolineatus*, Andalusia, p. 256, *curtulus*, Ebora, *strictus*, Toledo, p. 262, *sycophanta*, Alicante, p. 263, *scutellatus*, Portugal, p. 264, *minor*, Ronda, p. 267, and *punctulatus*, Guarda, p. 268, Fairmaire, An. Soc. Esp. xii.; *C. canalisternus*, p. 20, *versicolor*, Portugal, p. 22, *cylindricus*, Granada, p. 25, Marseul, L'Ab. xxi., and Fairmaire, *l. c.* pp. 269–271; *C. denticulatus*, Chevrolat, L'Ab. xxi. p. 12, Castille.

Halticides.

Haltica pallicornis, Fabr., injurious to *Smilax* in N. America; Lonsdale, Bull. Dep. Agric. Ent. ii. p. 28.

Graptodera carinata, Germ., injurious to fuchsia in America; *id. l. c.* p. 27.

Lactica elegantula, Har., var. from Bolivia noticed; Kirsch, B. E. Z. xxvii. p. 193.

Diphaulaca aulica, Oliv. (= *bicolor*, De Geer), and *wagneri*, Har., noticed; Jacoby, Biol. Centr. Am. *Col.* vi. (1) p. 264.

Psylloides hyoscyami, Linn., noticed; B. Cooke, Naturalist, viii. p. 94. *P. napi*, Koch, var. *flavicornis* from the Glatz Mountains described; Weise, Deutsche E. Z. xxvii. p. 219.

New genera and species :—

Halticopsis, Fairmaire, Le Nat. v. p. 197, and Ann. Soc. Ent. Fr. (6) iii. p. 112. Allied to *Haltica* (*oleracea*); antennæ thick, thorax not channelled. Type, *H. spissicornis*, sp. n., *ll. cc.*, Abyssinia.

Pentameria, Friedenreich, S. E. Z. xliv. p. 141. *Halticidæ*, but with 5-jointed tarsi. Type, *P. bromeliarum*, sp. n., *l. c.* p. 142, Blumenau, Brazil.

Systena discoidalis, Jacoby, P. Z. S. 1883, p. 405, pl. xlv. fig. 12, Ecuador.

Lactina balii, *haroldi*, and *puncticollis*, Kirsch, B. E. Z. xxvii. pp. 192–194, Ecuador.

Diphaulaca intermedia, Jacoby, Biol. Centr. Am. *Col.* vi. (1) p. 264, Panama.

Aspicela centrimaculata, Kirsch, *l. c.* p. 194, Colombia.

Asphæra prosternalis, id. *l. c.* p. 194, Bolivia.

Homophœta boliviana, id. *l. c.* p. 195, Bolivia.

Œdionychis serrulata, Peru, and *posticalis*, Bolivia, *id. l. c.* pp. 195 & 196.

Physonychis nigricollis, Jacoby, P. Z. S. 1883, p. 404, pl. xlv. fig. 11, Zanzibar.

Rhoicus clarki, Kirsch, *l. c.* p. 197, Ecuador.

Physomerus xanthurus, id. *ibid.*, Colombia.

Allochroma acroxanthum and *jucundum*, id. *l. c.* p. 198, Colombia.

Hypolampsis viridicænea, id. *l. c.* p. 199, Ecuador.

Galerucides.

Aulacophora marginata, Chapuis, varr. or spp. nn. (?) from Java and Saleyer noticed; Jacoby, Notes Leyd. Mus. v. p. 202.

Diabrotica longicornis, Say, noticed as destructive to corn in the United States; Thomas & French, Rep. Ins. Illin. x. pp. 44–46, & xi. pp. 65–72. *D. puncticollis*, Baly, var. from Ecuador noticed; Kirsch, B. E. Z. xxvii. p. 203.

Galerucella sagittariæ, Gyll. Larva described; Schaupp, Bull. Brooklyn Soc. vi. p. 54.

Dircema evidens, Er., var. *discedens* from Ecuador described; Kirsch, *l. c.* p. 206.

Galeruca, Geoffr., and allied genera, discussed; Weise, Deutsche E. Z. xxvii. pp. 315 & 316.

Galeruca xanthomelana, Schrank. Transformations, habits, ravages, &c., discussed; Riley, Rep. Dep. Agric. 1883, pp. 159–170, pl. xii. fig. 3, Van Wagenen, Canad. Ent. xv. p. 160, and Macloskie, P. Am. Ass. xxxi. pp. 472 & 473.

Merista variabilis, Har., = *Haplonyx trifasciatus*, Hope; *M. rufipennis*, Har., = *Leptarthra dohrni*, Baly; *Nerissus grisco-scutellatus*, Karsch, = *Chiridea subæuprea*, Jac.: Jacoby, P. Z. S. 1883, p. 406.

New genera and species :—

Dior [*r*] *habida*, Weise, Deutsche E. Z. xxvii. p. 316. Allied to *Galerucella*. Type, *G. elongata*, Brullé (= *carinata*, Fald.).

Lochmæa, id. *ibid.* Allied to *Galerucella*. Type, *G. capreæ*, Linn.

Narichona, Kirsch, B. E. Z. xxvii. p. 203. Allied to *Monocesta* and *Coraia*. Types, *N. haroldi* and *acroleuca*, spp. nn., *ibid.*, Colombia.

Oides jacobii and *borrii*, Duvivier, C.R. ent. Belg. xxvii. pp. clx. & clxi., New Guinea; *O. apicalis*, fig. 1, Sumatra, p. 399, *affinis*, fig. 4, Neilgherries, p. 400, *clarki*, fig. 3, and *biplagiata*, fig. 2, New Guinea, &c., p. 401: Jacoby, P. Z. S. 1883, pl. xlv.

Megalognatha cruciata, fig. 7, p. 401, *unifasciata*, fig. 8, Transvaal, and *bipunctata*, fig. 9, East Central Africa, p. 402, *id. l. c.* pl. xlv.

Aulacophora montrouzieri, Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 55, Duke of York Island; *A. unicolor*, Jacoby, Notes Leyd. Mus. v. p. 201, Saleyer.

Malacotheria picticollis, Fairmaire, *l. c.* p. 56, Duke of York Island.

Rhaphidopalpa flavipes, Jacoby, *l. c.* p. 202, Saleyer.

Diabrotica lacordairii, Bogota, p. 199, *jacobii*, Colombia, *fasciata*, Ecuador, p. 200, *sharpi*, Bolivia, *trabeata*, Ecuador, p. 201, *lineolata*, Bolivia, p. 202, and *bivittula*, Uruguay, Rio Grande do Sul, p. 203, Kirsch, B. E. Z. xxvii.

Lyperodes intra-marginalis, and *bisignatus*, id. *l. c.* p. 205, Colombia.

Cælomera boliviensis, id. *l. c.* p. 206, Bolivia.

Mesodonta transverso-fasciata, Jacoby, P. Z. S. 1883, p. 403, pl. xlv. fig. 5, West Africa.

Pachytoma gibbosa, id. *ibid.*, pl. xlv. fig. 6, Old Calabar.

Merista oberthueri, id. *l. c.* p. 404, pl. xlv. fig. 10, Thibet.

Monolepta cuchroma, Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 111, Abyssinia.

Hispides.

Hispini. Synopsis and list of N. American species; Horn, Tr. Am. Ent. Soc. x. pp. 290–303. The following synonymy is given :—*Micrrorhopala vittata*, Fabr., = *lætula*, Lec.; *xerene*, Newm., = *interrupta*, Coup.; *rubro-lineata*, Mann., = *signaticollis*, Lec.; *excavata*, Oliv., = *pluto*, Newm.; *cyanea*, Say, = *hecate*, Newm.; *melsheimeri*, Crotch, = *hardii*, Crotch; *Odontota collaris*, Say, = *walshi*, Crotch; *scapularis*, Oliv., = *lateralis*, Say; *bicolor*, Oliv., = *bacchus*, Newm.!; *dorsalis*, Thunb., =

scutellaris, Oliv., and *suturalis*, Harr.; *rubra*, Web., = *quadrata*, Fabr., *marginata*, Say, and *pallipes*, Germ.; *nervosa*, Panz., = *inæqualis* and *rosea*, Web., *suturalis*, Fabr., *flavipes*, Germ., *obsoleta* and *pallida*, Say, *philemon* and *baucis*, Newm.; *Stenohispa metallica*, Fabr., = *brevicollis*, Rand.

Arescus separata and *Prosopodonta limbata*, Baly, noticed; B. E. Z. xxvii. pp. 206 & 306.

Erionispa badeni, Chap., = *Pytheus pulcherrimus*, Pasc., and belongs to the Longicorns; Lameere, C.R. ent. Belg. xxvii. pp. clxi. & clxii.

Hispa algeriana, Guér., = *testacea*, Linn., var.; Leprieur, Bull. Soc. Ent. Fr. (6) iii. p. lxxx.

Stenopodius, g. n., Horn, Tr. Am. Ent. Soc. x. p. 301. Type of a separate group of *Hispini*; tarsal claws simply divergent, third joint of tarsi not bilobed, fourth long; antennæ very short, clavate. Type, *S. flavidus*, sp. n., *ibid.* pl. ix. fig. 8, California, Arizona.

New species :—

Oxycephala tripartita, Fairmaire, Ann. Ent. Belg. xxvii. Duke of York Island.

Octotoma marginicollis, Horn, Tr. Am. Ent. Soc. x. p. 300, pl. ix. fig. 9, Arizona.

Microrrhopala dimidiata, Texas, *vulnerata*, Arizona, p. 292, and *montana*, Montana, p. 294, *id. l. c.*

Odontota californica, California, Arizona, and *gracilis*, Texas, *id. l. c.* pp. 297 & 298.

Charistena perspicua, id. *l. c.* p. 298, Arizona, New Mexico.

Cassidides.

Cassidides. Dohrn notices Boheman's *Hybosa mellicula*, *Omoplata nigro-lineata*, *Dolichotoma mirifica* (var. from Iquitos), and *Mesomphalia elevata* (variation); S. E. Z. xliv. pp. 106, 363, 364, 496, & 498.

Canistra osculatii, Guér., and *Mesomphalia reticulata*, Boh., varr. noticed; Kirsch, B. E. Z. xxvii. p. 208.

New species :—

Mesomphalia balii, Colombia, and *marginata*, Ecuador, Kirsch, B. E. Z. xxvii. p. 207.

Chelymorpha bipuncta, id. *l. c.* p. 208, Bolivia.

Ctenochira respersa and *wageneri*, id. *l. c.* p. 209, Bolivia.

Coptocycla pectoralis, id. *l. c.* p. 210, Bolivia.

Erotylidæ.

Bedel, L. Essai sur la famille des *Erotylidæ*. 1. Révision des *Triplotoma*, Westw., et genres voisins. Ann. Mus. Genov. xviii. pp. 435–444, pl. x.

8 genera (mostly new) are tabulated. The following known species are figured :—*Eulytus bizonatus*, figs. 1 & 7 (mesosternum), and *Trichulus pubescens*, fig. 2, Crotch, *Triplatoma cyprœa*, figs. 3 & 8 (mesosternum),

and *gestroi*, fig. 4, Bedel, *Nesitis attenuata*, Crotch, fig. 5, *Linodesmus cœcus*, Fabr., fig. 6, and *Coptengis spinipennis*, Bed., fig. 9 (end of elytron).

Helota, Macl. Synopsis of species:—*H. gemmata*, Gorh., larva described and figured, p. 52, fig. 8, *H. mellii*, Westw., = *thibetana*, Westw.; *H. ocellata*, Rits., = *guerini*, Hope (figured, fig. 1): Olliff, Cist. Ent. iii. pp. 51-57, pl. iii. *H. cereo-punctata*, Lewis, and *gemmata*, Gorham, figured; Waterhouse, Aid, ii. pl. cxxxiii. figs. 1 & 2.

Episcapha taishoensis, *gorhami*, *hamata*, Lewis, and *fortinei*, Crotch, noticed; Lewis, Ent. M. M. xx. p. 140.

Coptengis sheppardi, Pasc. Variation noticed; Bedel, Ann. Mus. Genov. xviii. pp. 437 & 438.

Triplatoma gestroi, Bedel, redescribed and figured; Gorham, P. Z. S. 1883, p. 80, pl. xviii. fig. 1.

Erotylus lineatus and *Morphoides* (*Brachysphœnus*) *procerus*, Erichs., noticed; Dohrn, S. E. Z. xliv. pp. 104 & 105.

New genera and species :—

Neoblytus, Bedel, Ann. Mus. Genov. xviii. p. 438. Allied to *Coptengis*; third joint of antennæ short, and tip of elytra truncate. Type, *N. œratus*, sp. n., *ibid.*, New Guinea.

Trichulus, id. *ibid.* Allied to *Triplatoma*; short, pubescent above, last joint of labial palpi oval. Type, *T. pubescens*, Crotch (figured, pl. x. fig. 2).

Eulytus, id. *l. c.* pp. 436 & 441. Allied to *Triplatoma*; metasternum oblong between the middle coxæ, and bounded in front by a transverse line. Type, *T. bizonatus*, Crotch (figured, pl. x. figs. 1 & 7).

Nesitis, id. *l. c.* pp. 436 & 442. Allied to *Eulytus*; mesosternum bounded in front by a transverse line. To include *Triplatoma attenuata*, Crotch (figured, pl. x. fig. 5), *Engis sexnotata*, Wiedem., and *N. discrepans*, sp. n., *l. c.* p. 343, Sumatra.

Linodesmus, id. *l. c.* pp. 436 & 443. Allied to *Triplatoma*; funiculus slender, joints long; sides of metasternum not margined below the middle coxæ. Type, *Elater cœcus*, Fabr. (figured, pl. x. fig. 6).

Hybosoma, Gorham, P. Z. S. 1883, p. 77. Intermediate between *Coptengis* and *Triplatoma*. To include *H. hydropicum*, pl. xviii. fig. 6, *striatum*, p. 77, and *tetrastictum*, p. 78, spp. nn., Philippines.

Motrita, Westwood, Tijdschr. Ent. xxvi. p. 77. Allied to *Tritoma*. Type, *M. fulvipes*, sp. n., *l. c.* p. 78, pls. iii. fig. 16, & v. figs. 19–25 (details).

Helota gorhami, p. 53, *sinensis*, fig. 3, Chantung, N. China, p. 54, and *culta*, fig. 2, North India, p. 55, Olliff, Cist. Ent. iii. pl. iii.

Encaustes crotchi, Gorham, P. Z. S. 1883, p. 76, pl. xviii. fig. 7, Philippines, Bohol; *E. prænobilis*, Lewis, Ent. M. M. xx. p. 138, Japan.

Micrencaustes torquatus, pl. xviii. fig. 5, Old Calabar, and *plagiatus*, Java, Gorham, *l. c.* p. 76.

Megalodacne imperatrix, pl. xviii. fig. 8, Mamboia, and *furcata*, Old Calabar, &c., *id. l. c.* pp. 78 & 79; *M. bellula*, Lewis, *l. c.* p. 139, Japan.

Cryptodacne vagepunctata, Broun, N. Z. J. Sci. i. p. 497, New Zealand.

Episcaphula tetrasticta, Gorham, Notes Leyd. Mus. v. p. 253, Saleyer.

Episcapha semperi, Mindanao, *cordata*, Old Calabar, p. 81, *difficilis*,

Andamans, *octopustulata*, pl. xviii. fig. 4, Mindanao, and *piciventris*, Old Calabar, p. 82, *id.* P. Z. S. 1883; *E. perforata*, Lewis, *l. c.* p. 140, Japan.

Coptengis spinipenis, Bedel, Ann. Mus. Genov. xviii. p. 437, pl. x. fig. 9 (tip of elytron), Moluccas (Morotai).

Triplatoma gestroi, fig. 4, Sarawak, and *cyprœa*, figs. 3 & 8, Malacca, Sumatra, *id. l. c.* p. 440, pl. x.; *T. philippinensis*, fig. 3, Mindanao, *andamanensis*, fig. 2, pl. xviii., Andamans, p. 79, *brahminica* and *siva*, Assam, p. 80, Gorham, P. Z. S. 1883.

Pselaphacus mysticus, id. *l. c.* p. 84, Chancomayo; *P. conspersus*, Kirsch, B. E. Z. xxvii. p. 211, Bogota.

Megischyrus elongatus and *bartletti*, pl. xviii. fig. 9, Gorham, *l. c.* p. 85, Peru.

Ischyrus peruvianus and *grammicus*, id. *l. c.* pp. 85 & 86, Peru.

Lybas (?) *dorsalis*, id. *l. c.* p. 86, Peru.

Palæolybas cychramoides, id. *l. c.* p. 87, Camaroon Mountains.

Aulacochilus inclytus, *agaboides*, fig. 10, p. 83, and var. (?) *furciferus*, fig. 11, and *episcaphoides*, fig. 12, Andamans, p. 84, *id. l. c.* pl. xviii.

Brachysphanus (*Habrodactylus*) *arculifer*, Kirsch, *l. c.* p. 211, Ecuador.

Erotylus aquatoris, id. *l. c.* p. 211, Ecuador; *E.* (*Cypherotylus*) *badeni*, Dohrn, S. E. Z. xliv. p. 103, Chili? (more probably Peru or Amazons).

Endomychidæ.

List of *Endomychidæ* collected in Borneo, &c., by A. J. Xantus; Frivaldszky, Term. fuzetek, vi. pp. 123–133. At p. 126 he notices *Amphisternus histricosus*, Gerst., var. *borneensis*, *Spathomelas anaglyptus*, Gerst., var., and *S. turritus*, Gerst., var. *dispar*.

Encymon ruficollis, Gestro, = *immaculatus*, Montr.; Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 57.

Alexia, Steph. Revision; 15 species tabulated and briefly described, 8 new: Reitter, Deutsche E. Z. xxvii. pp. 236–242. 3 more species (2 new) added; *id. l. c.* pp. 393 & 394.

New genera and species :—

Dryadites, Frivaldszky, Term. füzetek, vi. p. 128, pl. ii. figs. 4–9, details. Intermediate between *Corynomalus* and *Asinax*. Type, *D. borneensis*, sp. n., *l. c.* p. 130, pl. i. fig. 3, Borneo.

Hybopterus, Fairmaire, Le Nat. v. p. 365. Allied to *Indalmos*. Type, *H. plagiicollis*, sp. n., *ibid.*, Madagascar.

Amphisternus tuberifer and *sexcristatus*, Frivaldszky, Term. füzetek, vi. pp. 123 & 125, pl. i. figs. 1, 1*a*, & 2, Borneo.

Eumorphus quadripustulatus, id. *l. c.* p. 126, Borneo.

Hylœa dalmatina, Kaufmann, Wien. ent. Z. ii. p. 10, Dalmatia, Herzegovina, Montenegro.

Milichius ferrugineus, Frivaldszky, *l. c.* p. 131, Sarawak.

Panomœa undecimnotata, id. *l. c.* p. 133, Borneo.

Alexia frigida, Weise, Deutsche E. Z. xxvii. p. 250, Alps; *A. alutacea*, *sublævis*, Caucasus, *meridionalis*, Andalusia, *carpathica*, Carpathians, p. 239, *lævicollis*, Vienna, p. 240, *nevadensis*, Sierra Nevada, p. 241, *obso-*

leta, Meskish Mountains, *puncticollis*, Caucasus, p. 242, *ignorans*, Carinthia, Styria, Carniola, Tyrol, p. 393, and *corcyrea*, Corfu, p. 394, Reitter, Deutsche E. Z. xxvii.

Mychophilus caspicus, id. Rev. mens. Ent. i. p. 113, Liryk, on the Caspian.

Diædes atro-clavatus and *oblongulus*, Fairmaire, Le Nat. x. p. 365, Madagascar.

Coccinellidæ.

Varieties of various species noticed; Von Heyden, Ent. Nachr. ix. pp. 52 & 53 (*cf.* also Gradl, *op. cit.* p. 69).

Megilla 4-maculata, Panz, recorded as new to Finland; Sahlberg, Medd. Soc. Fenn. ix. p. 154. *M. maculata*, De Geer, omnivorous, and sometimes destructive to corn; Am. Nat. xvii. pp. 322 & 323.

Coccinella hastata, Oliv., = *hieroglyphica*, Linn.; Weise, Deutsche E. Z. xxvii. p. 334.

Chilocorus renipustulatus, Scriba, noticed; Reuter, Medd. Soc. Fenn. ix. p. 126.

Litophilus. Species tabulated (14); *L. cordicollis*, Guér., and 4 new species, are described: Reitter, Deutsche E. Z. xxvii. pp. 61–64.

Epilachna mutabilis and *variabilis*, Crotch, and *dives*, Erichs., noticed; Kirsch, B. E. Z. xxvii. p. 213. *E. borealis*, Fabr.: transformations described; French, Canad. Ent. xv. pp. 189–191. *E. corrupta*, Muls., injurious to vegetables in America; Stone, Am. Nat. xvii. pp. 198 & 199.

Holopsis, g. n., Broun, N. Z. J. Sci. i. p. 498. Intermediate between *Oryssomus* and *Cranophorus*. To include *H. nigellus*, *pallidus*, and *lawsoni*, spp. nn., *l. c.* p. 499, New Zealand.

New species:—

Cœlophora rubro-nigra, Fairmaire, Ann. Ent. Belg. xxvii. (2) p. 58, Duke of York Island.

Cryptolæmus engelhardi, Gorham, Notes Leyd. Mus. v. p. 256, Saleyer.

Hyperaspis (*Cleothera*) *andicola*, Kirsch, B. E. Z. xxvii. p. 212, New Granada.

Scymnus sedatus and *villosus*, Broun, N. Z. J. Sci. i. pp. 497 & 498, New Zealand; *S.* (*Nephus*) *sannio*, Weise, Nat. Sicil. ii. p. 137, Sicily.

Pharus fleischeri, Greece, and *villosulus*, Syria, *id.* Wien. ent. Z. ii. pp. 67 & 68. (The latter = *Scymnus pharoides*, Mars.; *id. l. c.* p. 97.)

Litophilus trimaculatus, Syria, *subseriatus*, Siberia, *kalawrytus*, Morea, p. 63, and *unicolor*, Siberia, p. 64, Reitter, Deutsche E. Z. xxvii.

Corylophidæ.

Orthoperus, Steph. Various species noticed; Sahlberg, Medd. Soc. Fenn. ix. p. 159.

HYMENOPTERA.

BY

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

The General Subject.

André, E. Species des Hyménoptères d'Europe et d'Algérie. 16me-19me Fasc. (ii. pp. 281–548, 1*–20*, pls. xiii.–xx. & expl. pls. xix.–xxxiii.).

Includes the conclusion and the synonymic catalogue of ants, and a very long general introduction (not yet concluded) on wasps.

Brauns, —. Neue Werke über Hymenopteren, namentlich Apiden, und im Anschluss daran ein Verzeichniss der Hummelarten Mecklenburgs. Arch. Ver. Mecklenb. xxxvi. pp. 137–147.

Discusses the works of André and Schmiedeknecht, and Hoffer's observations on the "trumpeter" in *Bombus ruderatus* var. *argillaceus*. 18 species of *Bombus* and 5 of *Psithyrus* are recorded from Mecklenburg.

Cameron, P. Biologia Centrali-Americana [*cf.* Godman, & Salvin; *Insecta*, General Subject]. *Hymenoptera*, pp. 1–80, pls. i.–iv.

Includes *Tenthredinidæ*, *Siricidæ*, *Cynipidæ*, and the commencement of *Chalcididæ*.

Gribodo, G. Le Crociere dell' yacht 'Corsaro.' iv. Imenotteri. Ann. Mus. Genov. xviii. pp. 684–690.

11 species (none new) from Madeira and Teneriffe noticed. The following are specially discussed:—*Bombus ruderatus*, Fabr., *Anthophora maderæ*, Sich., *Halictus* sp., and *Chrysis ignita*, Linn., var.

La Munyon, I. W. New *Hymenoptera*. P. Nebraska Ass. March 8, 1877.

According to Psyche, iv. p. 172, contains descriptions of *Davisania aughei*, g. & sp. nn., and *Trypoxylon sulcus*, sp. n.

Lubbock, [Sir] J. Observations on Ants, Bees, and Wasps. Part x. With a description of a new genus of Honey-Ant. J. L. S. xvii. pp. 41–52.

Relates to the colour-sense of bees (in reply to H. Muller's objections),

hearing in bees (results negative), industry of wasps, and recognition and longevity of ants.

[Lubbock, (Sir) J.] Beobachtungen über die Lebensweise der geselligen Hymenopteren, mit 31 Abbildungen und 5 lithographirten Tafeln. Autorisirte Ausgabe. Internationale wissenschaftliche Bibliothek, lvii. Band. Leipsig: 1883, 8vo, pp. xvii. & 380. (Noticed by Karsch, Biol. Centr. iii. pp. 382 & 383, and by Schlechtendal, Z. Naturw. lvi. pp. 490-515.)

Mocsáry, A. *Hymenoptera* nova europæa et exotica. Ért. Term. Kör. xiii. pp. 1–72.

84 new species described.

Provancher, L. Faune Canadienne. Nat. Canad. xiv. pp. 3–20 & 33–38.

Contains additions and corrections to *Ichneumonidæ*, *Braconidæ*, *Cynipidæ*, *Proctotrypidæ*, *Chalcididæ*, *Pompilidæ*, *Crabronidæ*, and *Andrenidæ*.

Radoszkowski, O. Beschreibung [17] neuer Hymenopteren-Arten. Naturhist. Nachr. (Warsaw) ii. pp. 72–82.

[Not seen by Recorder.]

Saunders, E. Catalogue of British *Hymenoptera* (*Aculeata*). London: 1883, 8vo, pp. 8.

White, W. Farren. Ants and their Ways; with illustrations, and an appendix giving a complete list of genera and species of the British Ants. London: 1883, 8vo, pp. xvi. & 279. (Noticed, Nature, xxviii. pp. 293 & 294, and Ent. M. M. xix. p. 262.)

A popular work, in part a compilation, but including much interesting original matter. The term "ants" is used in its widest possible extension, to include *Formicidæ*, *Dorylidæ*, *Mutillidæ*, *Thynnidæ*, and *Termites*. The writer (ch. iii.) argues that Sir J. Lubbock's observations on the vision of ants are open to an alternative explanation, and thinks that ants may possibly shun the ultra-violet rays of the spectrum rather on account of their chemical action than of their colour. On p. 50, a curious instance of the beneficial effects of formic acid is related, which may not be unworthy the attention of medical men. F. Smith estimated the probable number of species of ants at about 3000 (pp. 87 & 88). Observations on *Aphides*, and other myrmecophilous insects, likewise occur. The illustrations are very fairly good.

Note on an organ existing in hind legs of some *Hymenoptera*, especially *Fossores*; Pérez, Act. Soc. L. Bord. xxxvi. p. xxviii.

List of *Hymenoptera* bred from galls of *Cynips kollari*; Billups, P. E. Soc. 1883, p. xxxi.

List of Hymenopterous parasites on *Lepidoptera*; Fitch & Bridgman, Ent. xvi. pp. 64–69.

The following parasitic *Hymenoptera* are noticed as destructive to *Leucania unipuncta*, and descriptions are copied (Thomas, Rep. Ins. Illin. x. pp. 38–41):—*Microgaster militaris*, fig. 5, *Glyphe viridescens*, *Hockeria*

perpulchra, *Mesochorus vitreus*, *Pezomachus minimus*, and *Chalcis alcifrons*, Walsh, *Ophion purgatus* and *Ichneumon suturalis*, Say. *Cf.* also Riley, Rep. U. S. Ent. Comm. iii. pp. 126–128.

Clarkson describes the cocoons of *Ophion macrurum*, Linn., *Trogus exesorius*, Brullé, *Bracon flavator*, Fabr., *Perilampus* sp., and *Chalcis* sp.; Canad. Ent. xv. pp. 162 & 163.

Sphærularia bombi, Lubb., is parasitic on ♀ ♀ of *Bombus*, *Apathus*, and *Vespa*; Cobbold, Tr. L. S. (2) Zool. ii. p. 358.

Wasp from Nicaragua infested by fungus; Cameron, P. N. H. Soc. Glasg. v. p. 4.

Conclusion of third list of Yorkshire *Hymenoptera*, based upon observations made in 1879, 1880, and 1881; Bairstow, Roebuck, & Wilson, Tr. Yorksh. Nat. Union, series D., *Articulata*, i. pp. 97–111.

Captures of *Hymenoptera* in the South of England; Billups, P. E. Soc. 1883, pp xxx. & xxxi.: in Hayling Island; E. Saunders, Ent. M. M. xx. pp. 86–88: at York in 1882; Wilson, Naturalist, viii. pp. 109 & 110.

List of *Hymenoptera* of the Valley of the Saal (665 species); Friese, Z. Naturw. lvi. pp. 185–218.

Additions to the list of *Hymenoptera* of the Upper Engadine; Von Heyden, JB. ges. Graub. xxvi. pp. 3–7.

Catalogue of 120 *Hymenoptera* (many new) from Eastern Africa; Magretti, Bull. Ent. Ital. xv. pp. 241–253 (several species are described by other entomologists).

Preliminary list of *Hymenoptera* of Kansas; Snow, Tr. Kansas. Ac. vii. [1881] pp. 97–101.

Apidæ.

De Casati, F. B. Delle Bibliografie speciali e particolarmente di quella Apistica. Lettura fatta al primo congresso internazionale apistico tenutosi a Milano nel Settembre, 1881. Firenze: 1882, 8vo, pp. 22.

The writer estimates the number of publications relating to the bee and its products at 7000 (altered to 8000 in margin).

Herbert, A. B. Bees and Bee-Culture. Tr. Edinb. Nat. Club, i. pp. 62–78 (plate of queen surrounded by workers).

Hoffer, E. Die Hummelbauten. Kosmos, xii. pp. 412–421, figs. 1–4.

Describes the foundation and construction of the nests of *Bombus*.

Müllenhoff, K. Ueber die Entstehung der Bienenzellen. B. E. Z. xxvii. pp. 165–170.

The writer argues that the regular hexagonal form of the cells is simply due to the mechanical effect of the pressure of the surrounding cells.

Müller, H. Versuche über die Farbenliebhaberei der Honigbiene. Kosmos, xii. pp. 273–299.

Bees in unaccustomed localities are timid, and find honey with difficulty, but rapidly become accustomed to their surroundings, especially under the guidance of comrades. Different bees exhibit a preference for

certain flowers over others, but very brilliantly coloured flowers are less attractive than those of more subdued colours. The results of a long series of experiments are summed up with the conclusion that blue or violet are the most attractive colours, and bright yellow the least so.

[Müller, H.] Arbeitstheilung bei Staubgefässen von Pollenblumen. Kosmos, xiii. pp. 241–259, figs.

Includes observations on different species of *Solanum*, *Cassia*, *Heeria*, *Tinnantia*, *Heteranthera*, &c., and on the visits which they receive from bees.

Pérez, J. Contribution a la Faune des Apiaires de France. 2me partie. Parasites. Act. Soc. L. Bord. xxxvii. pp. 205 *et seq.*

[Notice deferred, in consequence of only the commencement of this paper having appeared in 1883.]

Radoszkowsky, O. Sur quelques espèces Russes appartenant au genre *Bombus*. Bull. Mosc. lviii. pp. 168–226.

The writer asserts that the structure of the genital organs is too little known, and too variable a character to be taken into consideration, and disputes Morawitz's revision of the *Bombi*, as being chiefly based upon it; the species being discussed in detail. A table of the females and workers is appended.

Reber-Tschumper, D. Die Honigbiene (*Apis mellifica*, L.). Ber. St. Gall. Ges. 1881–82, pp. 119–164.

Relates chiefly to the reproduction of bees, and the functions of the workers.

Schiemann, P. Über das Herkommen des Futtersaftes und die Speicheldrüsen der Biene, nebst einen Anhange über das Riechorgan. Z. wiss. Zool. xxxviii. pp. 71–135, pls. v.–vii. (Abstract: Emery, Biol. Centr. iii. pp. 395–397.)

After a brief introduction, the author describes the five different systems of so-called salivary glands, one of which is found in the so-called tongue, three in the head, and one in the thorax. These glands differ very much, both in different species and in the sexes of bees, and evidently perform very various functions. System iii. is formed within the substance of the first part of the spinning glands of the larva; systems ii. and v. are formed from the excretory channels of system iii. Systems i. and iv. are entirely new formations, produced by invagination of the epidermis. The organ of smell has not yet been positively identified, but evidently resides in the antennæ, the appendages and structure of which are minutely described.

Schneider, A. Ueber die Entwickelung der *Sphærularia bombi*. Zool. Beitr. i. pp. 1–10, pl. i.

Queen *Bombi* infested with this parasite die at the beginning of June, without founding a colony.

Taschenberg, E. Die Gattungen der Bienen (*Anthophila*). B. E. Z. xxvii. pp. 37–100.

Smith's arrangement is adopted. The paper commences with remarks

on the various parts of structure useful in classification. This is followed by full characters of each genus, a table, and an index. 108 genera are admitted, including a new one, founded on a new species.

Parts 5–7 of Schmiedeknecht's "Apidæ Europææ" have appeared with the year, including pp. 315–582, pls. x.–xv. (details); including :—*Bombus*, species 9–38, pp. 65–133; *Psithyrus*, species 1–8, pp. 1–29, and *Andrena* (and subgenus *Campylogaster*, Dours), species 1–42, pp. 1–168.

Critical analysis of W. H. Müller's paper on proterandry in bees [*cf.* Zool. Rec. xix. *Ins.* p. 124]; Karsch, Biol. Centr. iii. pp. 111 & 112, and B. E. Z. xxvii. p. xxv.

Bees and flowers; superstitions connected with bees, &c.: Gard. Chron. (2) xiv. pp. 154, 254, 255, 318, 319, 373, 503, 818, & 819.

Relation between bees and *Orchis mascula*; Malan, Sci. Goss. xix. pp. 52–57, 76–79, & 246–249 (*cf.* also p. 181).

Fertilization of *Solanum rostratum* by bees; Brown, Gard. Chron. (2) xix. p. 735.

List of *Anthophila* collected at Hermannstadt in 1882; Heinrich, Verh. siebenb. Ver. xxxiii. pp. 115 & 116.

Habits of bees at the Cape; De Villiers & Carey-Hobson, Nature, xxviii. pp. 5, 6, & 81, and Kosmos, xiii. pp. 216–218.

Andrenides.

Prosopis. Odours emitted by various species; Pérez, Act. Soc. L. Bord. xxxvi. p. xxvii.

Halictus ontariensis, Prov., = *Ceratina dupla*, Say; Provancher, Nat. Canad. xiv. p. 38.

Macropis labiata, Panz. Hermaphrodite noticed and figured; Enock, P. E. Soc. 1883, pp. xxv. & xxvi.

Cilissa dimidiata, Mor., var. *hungarica* described; Mocsáry, Ért. Term. Kör. xiii. p. 58.

Andrena pectoralis (Pérez, MS., = *vitrea*, Thoms., *nec* Smith), Europe, p. 526 (*Andr.*, p. 112), *lichtensteini* (Pérez, MS.), S. France, Spain, Balearic Islands, p. 531 (*Andr.*, p. 117), *paveli* (Mocs., MS.), Hungary, p. 541 (*Andr.*, p. 127), *hiendlmayri*, Balearic Islands, Corfu, p. 546 (*Andr.*, p. 132), *gallica* (Pérez, MS.), Bordeaux, p. 549 (*Andr.*, p. 135), *schmiedeknechti* (Magretti, MS.), Florence, p. 563 (*Andr.*, p. 149), *kriechbaumeri* (= *punctatissima*, Kriechb., *nec* Moraw.), Lesina, p. 569 (*Andr.*, p. 155), Schmiedeknecht, Ap. Eur. i.; *A. schmiedeknechti* and *florentina*, Magretti, Ann. Soc. Ent. Fr. (6) iii. pp. 200 & 202, pl. vii. No. iii. figs. 1 & 2 (details), Florence: spp. nn.

Apides.

Anthidium sticticum, Fabr., *Anthophora pennata*, Lep., *Cnigbiene* *sicula*, Rossi, and *Osmia aurulenta*, Panz., noticed; De Stefani, ii. pp. 282–284.

Nomada. List of species found in Mecklenberg (25); Brauns, Arch. Ver. Mecklenb. xxxvi. pp. 148–150.

Coelioxys haemorrhoa, Nyl., recorded as new to Finland; Sahlberg, Medd. Soc. Faun. ix. p. 154.

Nomada aurulenta, Panz., and its parasite, *Sapyga punctata*, Klug, noticed; Friese, Ent. Nachr. ix. pp. 67 & 68. *O. tridentata*, Duf. & Perr.: habits described; Fabre, Nouv. Souv. Ent. pp. 229–261.

Chalicodoma pyrenaicum, Lep. At the suggestion of Darwin, Fabre undertook a series of experiments to test the power of the bees to return to their nests when carried to a distance; a considerable number returned safely: *l. c.* pp. 99–138.

Megachile curvicrus, Thoms., and *willughbiella*, Kirby, noticed; Sahlberg, *l. c.* p. 137.

Xenoglossa, Smith. Generic characters discussed, and *X. fulva*, Smith (= *Anthophora holopyrrha*, Sich.), and *X.* (?) *pruinosa*, Say, redescribed; Gribodo, Ann. Mus. Genov. xviii. pp. 269–274.

Anthophora sp. from Socotra described; Taschenberg, Z. Naturw. lvi. p. 176. *A. croceipes*, Morawitz, ♂ described by him; Rev. mens. Ent. i. pp. 95 & 96.

Psithyrus, Lep. There are 5 British species, Smith having confounded *barbutellus*, Kirby, with *quadricolor*; E. Saunders, Ent. M. M. xix. pp. 267 & 268.

Bombus. Relations to clover, cats, and mice; colour-sense: Sci. Goss. xix. pp. 243 & 164. Young ♀♀ collect pollen during the first year of their existence; Hoffer, Kosmos, xiii. pp. 675 & 676. *B. nivalis*, Zett., recorded as new to Finland; Sahlberg, *l. c.* p. 164. *B. pennsylvanicus* inhabiting a deserted wren's nest; Osborn, Canad. Ent. xv. p. 172.

Melipona and *Trigona* guided by tradition in the construction of their nests; F. Müller, Nature, xxvii. pp. 240 & 241.

Apis mellifica. The tongue is a trough on the upper side of the apex, and a tube for the rest of its length; Cheshire, P. E. Soc. 1883, p. xix. Fertilizing red clover in New Zealand; Meyrick, *tom. cit.* pp. xxix. & xxx.

Various notes relative to bees will be found in Gard. Chron. (2) xx. Drumming of bees, pp. 44, 45, 76, & 77; visiting monkshood, pp. 181, 182, 213, & 299; bee-plants, p. 306; bee-keeping in India, p. 342; bees and colours of flowers, pp. 538, 570, 593, & 594.

The worker-bee does not transfer larvæ from one cell to another; Ulivi, L'Economia rurale, fasc. 11 (*cf.* Bull. Ent. Ital. xv. p. 194).

Apiarian notes in Argyllshire for 1881; Bennett, P. N. H. Soc. Glasg. v. pp. 163–166.

On the secretions of bees; Friedrich, Ber. Ges. Chemn. vii. [1881] pp. 72–76.

Melectoides, g. n., Taschenberg, B. E. Z. xxvii. p. 75. Intermediate between *Melecta* and *Osiris*; form of *Melecta*; front of the head with raised hair. Type, *M. senex*, sp. n., *ibid.*, Parana.

New species:—

Nomada algira, p. 60, *sagana*, p. 61, *melanura*, Algeria, p. 62, *lateritia*, Dobrudsha, *tenella*, Caucasus, p. 63, *bispinosa*, Hungary, Dobrudsha, p. 64, *laticrus*, Brussa, *carnifex*, Malaga, p. 66, *dolosa*, Granada, p. 67.

erythrosoma, Brussa, *graia*, Epirus, p. 68, and *fossulata*, Persia, p. 69, Mocsáry, Ért. Term. Kör. xiii.; *N. piccioliana*, Magretti, Ann. Soc. Ent. Fr. (6) iii. p. 203, pl. vii. No. iii. figs. 3–3*c* (details), Florence.

Crocisa cæruleifrons, Kirby, P. Z. S. 1883, p. 343, Timor Laut Islands.

Tetralonia glaucopis, Mocsáry, *l. c.* p. 55, Hungary.

Osmia parva, Provancher, Nat. Canad. xiv. p. 37, Canada.

Anthophora manni, Mocsáry, *l. c.* p. 54, Sicily, Algeria; *A. arctica*, Olenek, E. Siberia, p. 33, *hansoni*, Irkutsk, p. 35, and *sagemehli*, Persia, p. 93, Morawitz, Rev. mens. Ent. i.

Xenoglossa fuliginosa, Gribodo, Ann. Mus. Genov. xviii. p. 273, Caracas.

Xylocopa forbesi, Kirby, *l. c.* p. 344, Timor Laut Islands; *X. xanti*, Mocsáry, *l. c.* p. 58, Sarawak.

Bombus unicus, Amur, p. 235, *oberti*, p. 238, *hydrophthalmus*, Wernoje, p. 240, and *flavo-barbatus*, Amur, p. 242, Morawitz, Hor. Ent. Ross. xvii.; *B. persicus*, Radoszkowsky, Bull. Mosc. lviii. (1) p. 214, Demavend; *B. andamanus*, Gribodo, *l. c.* p. 268, Andamans.

Euglossa (*Eulema*) *auripes* [leg figured] and *E.* (*E.*) *distinguenda*, id. *l. c.* pp. 266 & 267, Cayenne.

Vespidæ.

Hayek, G. v. Ueber Wespen und deren Baue. Schr. nat. Kenntn. xxii. pp. 33–52.

A popular article.

Stone, J. M., & S. Habits and economy of wasps. Rep. W. Kent Soc. 1882–83, pp. 21–27 & 54–58.

List of Sicilian *Diploptera*; Destefani, Nat. Sicil. ii. pp. 86 & 87.

Eumenes amedei, Lep., *pomiformis*, Fabr., and allies: architecture, habits of larva, &c., described; the egg is suspended by a slender thread; Fabre, Nouv. Souv. Ent. pp. 57–76. *E. fraterna*, Say, destructive to canker-worms; Riley, Rep. U. S. Ent. Comm. iii. p. 177, fig. 3.

Odynerus. Architecture, habits of larva, &c.; the egg is suspended by a thread as in *Eumenes*: Fabre, Nouv. Souv. Ent. pp. 77–98. *O. rubicola*, Duf.: Dufour's observations quoted and criticised; *id. l. c.* pp. 234–236.

Rhynchium parentissimum, Sauss., noticed; Fitch, P. E. Soc. 1883, p. ii.

Vespa crabro attracted by the light thrown by a lamp on a wall; Lucas, Bull. Soc. Ent. Fr. (6) iii. p. xxix.

Hornets killing wasps, and wasps attacking flies and butterflies; Kingsford & Tooner, Sci. Goss. xix. pp. 23 & 37.

Queen wasp observed on Dec. 29; [Miss] Bayley, Ent. xvi. p. 48.

Vespa austriaca lives as a guest in the nests of *V. germanica*; Holmgren, Ent. Tidskr. iv. pp. 60 & 115. *V. norvegica* nesting in the "super" of a straw hive inhabited by bees; Wilkinson, Sci. Goss. xix. p. 116. *V. vulgaris*: note on a nest suspended under the roof of an outhouse; E. Saunders, Ent. M. M. xx. pp. 42 & 43.

New species :—

Belonogaster tricolor, Taschenberg, Z. Naturw. lvi. p. 175, Socotra.

Odynerus lobatus, p. 229, *sulcatus*, p. 230, *trinacriæ*, p. 231, *insularis* and *depressus*, p. 232, and *destefanii*, p. 233, André, Nat. Sicil. ii.; *O. siculus*, Destefani, *tom. cit.* p. 85, Sicily; *O.* (*Ancistrocerus*) *jucundus*, Budapest, p. 49, *O.* (*Lionotus*) *andrei*, Granada, p. 50, *O.* (*Epipone*) *albicinctus* (André, MS.), Malaga, p. 51, *O.* (*E.*) *terricola*, Budapest, Slavonia, p. 52, *O.* (*E.*) *bulgaricus*, Bulgaria, and *O.* (*E.*) *sibiricus*, Siberia, p. 54, Mocsáry, Ért. Term. Kör. xiii.

Polistes extraneus, Kirby, P. Z. S. 1883, p. 344, Timor Laut Islands.

Crabronidæ.

Sickmann, F. Verzeichniss der bei Wellingholthausen bisher aufgefundenen Raubwespen, mit biologischen und litterarischen Notizen. JB. Ver. Osnabrück, v. pp. 60–93.

Chiefly of local interest.

Pompilides.

Pompilus rufipes, Van der Lind., is not a *Prio*[*no*]*cnemis*; but *P. versicolor*, Scop., to which it has erroneously been referred, is one, and = *P. ipunctatus* and *variegatus*, Fabr., Dahlb., &c.; *Prio*[*no*]*cnemis gibbus*, Fabr. (= *coriaceus*, Dahlb.), must take the name of *perturbator*, Harr., as *gibbus*, Scop., = *exaltatus*, Fabr.; *Prio*[*no*]*cnemis propinquus*, Lep., redescribed: Kohl, Deutsche E. Z. xxvii. pp. 179–183.

Pompilus. Mode of attacking and overcoming large spiders; Fabre, Nouv. Souv. Ent. pp. 206–225. Manifesting memory; *id. l. c.* pp. 153–156. *P. castaneus*, Prov., = *argenteus*, Cress.; Provancher, Nat. Canad. xiv. p. 35. *P. unguicularis*, Thoms., recorded as new to Britain, and redescribed; E. Saunders, Ent. M. M. xx. pp. 135 & 136.

Prio[*no*]*cnemis wakefieldi*, W. F. Kirby, figs. 1 & 2, *conformis*, figs. 4 & 5, *monachus*, fig. 6, and *maculipennis*, Smith, fig. 9, figured ;†Waterhouse, Aid, ii. pl. cxxxvii.

Pompilus hiendlmayri, Kohl, Wien. ent. Z. ii. p. 49, Aragon; *P. gredleri*, id. Deutsche E. Z. xxvii. p. 184, Brussa: spp. nn.

Prio[*no*]*cnemis sordidipennis*, Sicily, p. 179, *mocsarii*, Corfu, p. 181, and *frey-gessneri*, Brussa, p. 183, *id.* l. c.; *P. huttoni* (W., fig. 8), p. 199, *xenos* (W., fig. 3), and *pascoei* (W., fig. 7; = *Ichneumon lotatorius*, Fabr., var.; Fitch, P. E. Soc. 1883, p. xxxvi.), p. 20, Kirby, Tr. E. Soc., 1883, and Waterhouse, Aid, ii. p. cxxxvii., New Zealand: spp. nn.

Ceropales superba, sp. n., Provancher, Nat. Canad. xiv. p. 36, Toronto.

Sphegides.

Ammophila hirsuta, Kirby. Mode of hunting and of overpowering its prey, consisting of larvæ of *Agrotis segetum*, which are detected under the surface of the ground by some apparently unknown sense. The larva is carefully paralyzed in every segment before being buried, which leads the author to conclude that the *Ammophila* originally preyed on insects

more easily paralyzed, and as it gradually attacked larger insects, its instincts enlarged, and became hereditary. Fabre, Nouv. Souv. Ent. pp. 19–56.

Pelopœus. *Stilbum splendidum* parasitic in the nest of *P. destillatorius*, and *Sitaris muralis* in that of *P. spirifex*; Destefani, Nat. Sicil. iii. pp. 9 & 10. *P. lætus*: habits and nest-building described; *Larrada australis* deposits its eggs in its nests; Whittell, P. Linn. Soc. N. S. W. viii. pp. 29–32.

Eremochares, g. n., Gribodo, Ann. Mus. Genov. xviii. p. 265. Allied to *Ammophila*; recurrent nervures received by second and third cubital cells; tarsal claws unidenticulate beneath. Type, *E. doriæ*, sp. n., *ibid.*, Tunis.

New species :—

Chlorion columbianum, Gribodo, Ann. Mus. Genov. xviii. p. 262, Caracas.

Trigonopsis soror and *frivaldskii*, Mocsáry, Ért. Term. Kör. xiii. p. 23, Brazil.

Pelopœus rufipes, id. *l. c.* p. 24, Amboina; *P. madecassus*, Madagascar, and *japonicus*, Japan, Gribodo, *l. c.* pp. 263 & 264.

Ammophila hungarica, Buda-Pest, p. 25, *clypeata*, Epirus, p. 27, *hispanica*, Malaga, *modesta*, Granada, p. 28, *turcica*, Brussa, p. 29, and *syriaca*, Syria, p. 30, Mocsáry, *l. c.*

Psammophila polita, S. Russia or Caucasus, and *caucasica*, Tiflis, *id. l. c* pp. 30 & 31.

Sphex orientalis, S. Russia or Caucasus, p. 31, *melanarius*, Tiflis, p. 32, *persicus*, Persia, *luteipennis*, Amboina, p. 33, *lanatus*, Transvaal, p. 34, and *pulchripennis*, Ashanti, p. 35, *id. l. c.*

Enodia græca, Corfu, p. 35, *argentata*, S. Russia or Caucasus, p, 36, and *oblique-striata*, Beyrut, p. 37, *id. l. c.*

Larrides.

Tachytes, Panz. The true type is *Pompilus tricolor*, Panz. (= *T. obsoleta*, auct.), but *Tachytes* very probably falls, as = *Liris*, Fabr.; Kohl, Deutsche E. Z. xxvii. p. 166. *T. erythropus*, Costa, = *Lyrops* (*Tachysphex*) *fluctuata*, Gerst.; *T. grandis*, Chevr., = *Larra anathema*, Rossi; and *T. discolor*, Friv., = *T.* (*Tachysphex*) *panzeri*, Van der Lind.: *id.* Wien. ent. Z. ii. p. 226. *T. lativalvis*, Thoms., recorded as new to Britain, and redescribed; E. Saunders, Ent. M. M. xx. p. 136.

Larrada australis parasitic on *Pelopœus lætus*; Whittell, P. Linn. Soc. N. S. W. viii. pp. 32 & 33.

Tachysphex, g. n., Kohl, Deutsche E. Z. xxvii. p. 166. A section of *Tachytes* including about 25 European species; slender, but slightly hairy; front tibiæ strongly emarginate near the base in ♂. The following new species are described:—*T. gallica*, p. 167, *filicornis*, Marseilles, p. 169, *schmiedeknechti*, Ægina, p. 170, *mediterranea*, Sicily, p. 173, *græca*, Epirus, Corfu, p. 174, *pygidialis*, Greece, Italy, Sicily, p. 176, and *julliani*, Marseilles, p. 177.

Larrada cowani, sp. n., Kirby, Tr E S. Soc. 1883, p. 200, Madagascar.

Astata rufipes, sp. n., Mocsary, Ért. Term. Kör. xiii. p. 22, Buda-Pest.

Bembicides.

Bembex julii, Fabre, = *sinuata*, Panz.; Fauvel, Rev. d'Ent. ii. p. 161.

Bembex pannonica, Buda-Pest, p. 38, *lichtensteini*, S.E. France, p. 39, *gallica*, France, p. 40, *occitanica*, S. France, Spain, Algeria (?), p. 41, *cristata*, Granada, p. 42, and *fuscilabris*, Epirus, Corfu, p. 43, spp. nn., Mocsáry, Ért. Term. Kör. xiii.

Bembicinus biarmatus, sp. n., *id. l. c.* p. 45, Brussa.

Nyssonides.

Stizus hispanicus, Granada, *lacteipennis*, S. Russia or Caucasus, p. 44, and *kohli*, Syria, p. 45, spp. nn., *id. l. c.*

Crabronides.

Tripoxylon figulus, Linn., noticed; Fabre, Nouv. Souv. Ent. p. 229.

Crabro kollari, Dahlb., recorded as new to Britain, and redescribed; E. Saunders, Ent. M. M. xix. p. 246. *C. rubicola*, Duf., recorded as new to Finland; Sahlberg, Medd. Soc. Fenn. ix. p. 164.

Thyreopus. List of European species; Kohl, Wien. ent. Z. ii. p. 50.

Solenius nigritarsis, Herr.-Schäff., ♀ described; *id. l. c.* pp. 81 & 82.

Cerceris antoniæ, Fabre, = *conigera*, Dahlb.; Fauvel, Rev. d'Ent. ii. p. 161.

Taranga, g. n., Kirby, Tr. E. Soc. 1883, p. 201. Allied to *Pemphredon*. Type, *T. dubia*, sp. n., *ibid.*, New Zealand.

New species :—

Cerceris morawitzi, p. 46, *falva* and *orientalis*, p. 47, Mocsáry, Ért. Term. Kör. xiii., S. Russia or Caucasus.

Thyreopus korbi, Kohl, Wien. ent. Z. ii. p. 50, Spain.

Thyreocerus massiliensis, id. Deutsche E. Z. xxvii. p. 163, Marseilles.

Lindenius ibex, id. *l. c.* p. 161, Corfu.

Oxybelus aurantiacus, Mocsáry, *l. c.* p. 48, Budapest; *O. brodiei*, Provancher, Nat. Canad. xiv. p. 36, Toronto.

Scoliides.

Dielis laratensis, sp. n., Kirby, P. Z. S. 1883, p. 345, fig., Timor Laut Islands.

Cosila argenteo-cincta, sp. n., Gribodo, Ann. Mus. Genov. xviii. p. 261, Australia.

Myzine græca, Syria, and *nigriceps*, S. Russia or Caucasus, spp. nn., Mocsáry, Ért. Term. Kör. xiii. pp. 18 & 19.

Tiphia maior, Gibraltar, p. 20, *caucasica*, Caucasus, and *algira*, Algeria, p. 21, spp. nn., Mocsáry, *l. c.*

Sapygides.

Sapyga punctata, Klug (parasitic on *Osmia aurulenta*, Panz.), noticed; Friese, Ent. Nachr. ix. pp. 67 & 68.

Mutillidæ.

In addition to many new species, Kohl figures the thorax of *Mutilla soror*, Sauss., *vicina*, Rad., *capensis*, Sauss., *pygidialis*, Gerst., *guinecnsis*, Fabr., *suavissima* and *superba*, Gerst., and a new species (?) from Venezuela unnamed; Verh. z.-b. Wien, xxxii. pl. xxiii. figs. 3, 7, 8, 10, 13, 23, 24, & 29.

Mutilla europæa, Linn.: stridulation, &c.; White & Pasley, Ants and their Ways, pp. 82–85. *M. occidentalis*, Linn.: severity of sting, and toughness of integument; Mendelhall, Am. Nat. xvii. pp. 323 & 324.

Mutilla zulu, figs. 1 & 17, South Africa, p. 475, *nereis*, fig. 2, Java, p. 476, *aciculata*, figs. 4 & 19, Australia, p. 477, *boopis*, fig. 5, Celebes, p. 478, *rogenhoferi*, figs. 6 & 18, Benguela, p. 479, *caffra*, fig. 9, Caffraria, p. 480, *bispinosa*, fig. 11, p. 481, *livingstonis*, fig. 12, Zambesi, *anonyma*, fig. 20, Sumatra, p. 482, *fucata*, fig. 14, Caffraria, p. 483, *tauriceps*, figs. 15 & 16, Cape, p. 484, *nepheloptera*, N. Australia, p. 485, *muricea*, Brazil, p. 486, *blattoserica*, Lima, p. 487, *helleri*, fig. 30, Valdivia, p. 488, *decorosa*, p. 489, *pollens*, *sodalicia*, p. 490, *nattereri*, fig. 26, Brazil, p. 491, *tournieri*, Venezuela, p. 492, *taliata*, fig. 28, Bahia, p. 493, *auricoma*, fig. 27, Brazil, p. 494, *platensis*, Buenos Aires, p. 495, and *mayri*, Bahia, p. 496, spp. nn., Kohl, Verh. z.-b. Wien, xxxii. pl. xxiii.

Thynnidæ.

Tachypterus argentinus and *cordovensis*, spp. nn., Weyenbergh, B. E. Z. xxvii. pp. 279 & 282, Argentine Republic.

Formicidæ.

Hemsley, W. B. Social life of Ants and Plants. Gard. Chron. (2) xx. pp. 71 & 72.

McCook, H. C. The Occident Ant in Texas. P. Ac. Philad. 1883, pp. 294–296.

Records observations by J. E. Todd on the distribution and site, nidification, and harvesting habits of *Pogonomyrmex occidentalis*.

——. How a Carpenter Ant founds a Colony. *L. c.* pp. 303–307.

Records observations by McCook, Leidy, and Potts. A queen founds a new colony alone, and attends herself to the eggs and larvæ till workers are matured.

Saussure, H. de. Les Fourmis américaines. Bibl. Univ. (3) x. pp. 28–38 & 158–172.

Notes on habits, &c., abridged from the works of McCook.

White, W. Farren. Ants and their Ways [cf. *Hymenoptera*, General Subject, *suprà*, p. 125].

Mental status of ants; W. F. Kirby, Evolution and Natural Theology, pp. 149 & 150.

Ants chiefly directed by smell; Cosson, Feuill. Nat. iii. p. 139.

Notes on ants and *Aphides*; Buckton, Brit. Aph. iv. pp. 95–104. He is inclined to regard the latter simply as pets.

Relations between ants and *Paussidæ* discussed; Péringuey, Tr. E. S. S. Afr. 1883 pp. 133–138 (*cf.* also P. E. Soc. 1883, pp. ii. & iii.).

Ants destroying rosebuds; Henderson, Gard. Chron. (2) xix. p. 253.

On destroying ants in greenhouses; Rowlett, *tom. cit.* p. 605.

Ants entrapped by *Lychnis viscosa*; Stone, P. L. S. 1880–82, p. 23.

Captures of ants and ants' nest-beetles; E. Saunders, Ent. M. M. xx. pp. 18 & 19.

List of 9 ants (2 new), chiefly collected in Madeira and the Canaries; *Camponotus sylvaticus*, Ol., and *Aphænogaster barbara*, Linn., are specially noticed: Emery, Ann. Mus. Genov. xviii. pp. 448–452.

Black ant visiting pitcher-plants in Borneo for the sake of entrapped insects; Burbidge & Masters, P. L. S. 1875–80, p. liii.

Notes on 12 ants of New Caledonia, 8 new; Emery, Bull. Ent. Ital. xv. pp. 145–151.

Formica fusca, Linn., *cinerea*, *cunicularia*, and *gagates*, Latr., and probably *glabra*, White [vide *infrâ*], are synonymous; E. Saunders, Ent. M. M. xx. pp. 16 & 17. *F. ligniperda*, Latr., undermining a verandah; Reed, Canad. Ent. xv. p. 140. *F. rufa* appearing in the winged state at the end of May; Collett, Ent. M. M. xx. p. 42.

Stenamma westwoodi. Two species have been confounded under this name. The ♂, which is typical, and will stand as *S. westwoodi*, = *Ascmorrhoptrum lippula*, auct.; and the ♀ and worker supposed to belong to *S. westwoodi* = *Formicoxenus nitidulus*, Nyl. E. Saunders, *l. c.* p. 16.

Tetramorium cæspitum, Linn., var. *semilæve* from the Mediterranean Region described; André, Spec. Hym. ii. p. 286.

Aphænogaster barbara, Linn., varr. *nigra*, *semirufa*, *meridionalis*, *minor*, p. 355 [*cf.* also p. 368], *rugosa* and *striaticeps*, p. 356, described; *id. l. c.*

Polyergus rufescens appears to be guided in its marauding expeditions by sight, and by the memory of locality; Fabre, Nouv. Souv. Ent. pp. 140–152.

Phidole javana, Mazo (?). Galleries in *Myrmecodia* noticed; Britten & Forbes, P. L. S. 1875–80, p. liii.

Epitritus argiolus, Emery, recorded as new to Hungary; Mayr, Term. füzetek, vi. pp. 141, 142, 196, & 197.

New genera and species :—

Melophorus, Lubbock, J. L. S. xvii. p. 51. Type, *M. bagoti*, sp. n., *l. c.* p. 52, pl. ii., Australia, lat. 21° S. (a honey-ant).

Oxyopomyrmex, André, Spec. Hym. ii. p. 378, pl. xxii. Allied to *Aphænogaster*; antennæ 11-jointed, pronotum less rounded, second node of petiole nearly twice as large as first. Type, *O. oculatus*, sp. n., *l. c.* p. 380, Jaffa.

Formica glabra, White, Ants and their Ways, p. 80, Bournemouth [= *gagates*, Smith (*nec* Latr.), Ent. Ann. 1866, pp. 127 & 253].

Camponotus fœx, Emery, Ann. Mus. Genov. xviii. p. 449 (fig. of thorax), Canaries; *C. gambeyi* and *camelus* (fig.), id. Bull. Ent. Ital. xv. pp. 145 & 146, New Caledonia.

Leptomyrmex pallens, id. *l. c.* p. 147, fig., New Caledonia.

Polyrrhachis exul, Emery, *l. c.* p. 147, New Caledonia; *P. ritsemai* [*-rnæ*], Sumatra, and *ceramensis*, Ceram, Mayr, Notes Leyd. Mus. v. pp. 245 & 246.

Ectatomma fulgens, fig., p. 148, *pulchellum*, New Caledonia, p. 149, and *mayri*, New Zealand (?), p. 150, note, Emery, *l. c.*

Leptothorax gracilicornis, id. Ann. Mus. Genov. xviii. p. 450 (fig. of antenna), Teneriffe.

Monomorium clavicorne and *abeillii*, André, Spec. Hym. ii. pp. 332 & 335, Jaffa.

Aphænogaster blanii, Marseilles, p. 350, *crocea*, Oran, p. 357, and *hispanica*, Madrid, pp. 365 & 372, *id. l. c.*

Prenolepis sumatrensis, Mayr, *l. c.* p. 247, Sumatra.

Myrmecia apicalis, Emery, Bull. Ent. Ital. xv. p. 150, New Caledonia.

Meranoplus leveiltii, id. *l. c.* p. 151, fig., New Caledonia.

Chrysididæ.

Extracts from Mocsáry's work on Hungarian *Chrysididæ* translated, including notes on bibliography, geographical distribution, &c.; Ent. Nachr. ix. pp. 136–140.

Cleptes semiauratus bred from a cocoon of *Nematus*; Fletcher, Ent. M. M. xx. p. 71.

Hedychrum plagiatum, sp. n., Mocsáry, Ért. Term. Kör. xiii. p. 94, Brussa.

Chrysis melanops, Kirby, P. Z. S. 1883, p. 315, Timor Laut Islands; *C.* (*Gonochrysis*) *scita*, Syria, p. 14, *C.* (*Tetrachrysis*) *cruenta*, Caucasus, p. 15, *C.* (*T.*) *maroccana*, Morocco, p. 16, *C.* (*T.*) *dira*, Ashanti, and *C.* (*Pentachrysis*) *quinquedentata*, Java, p. 17, Mocsáry, *l. c.*: spp. nn.

Ichneumonidæ.

Bignell, G. C. Contribution towards the Fauna of the Neighbourhood of Plymouth. *Hymenoptera : Ichneumonidæ*. Arranged according to T. A. Marshall's Catalogue, published by the Entomological Society of London, 1872. Rep. Plym. Inst. viii. pp. 279–284.

Includes several species new to Britain.

Bridgman, J. R. Further Additions to Marshall's Catalogue of British *Ichneumonidæ*. Tr. E. Soc. 1883, pp. 139–171.

Many species (some new) are here added to the British list. The following are the most important known species mentioned:—*Hemiteles vicinus*, Grav., ♂ described; *Aptesis fœrsteri*, Bridg., = ? *Catalytus mangeri*, Grav.; *Pezomachus dubitator*, Bridgm. (*nec* Först.), = *P. analis*, Först., var., which is not distinct from *P. conveniens*, Först.; *P. vagans*, Oliv., redescribed.

——, & Fitch, E. A. Introductory Papers on *Ichneumonidæ* (continued). Ent. xvi. pp. 33–38, 100–108, 155–159, & 225–230.

Includes *Cryptidæ* (*Linoceras* to *Pezomachus*).

ght between an ichneumon (?) and a spider; Cree, Sci. Goss. xix. wi[illegible]9) & 191.

[illegible]*nomalon* sp. and *Trogus exesorius*, Brull., parasitic on *Papilio ajax*, [illegible]un.; Mundt, Canad. Ent. xv. p. 89.

Ichneumonides.

Ichneumon sp. two and three years in pupa; M'Rae, Ent. xvi. p. [illegible] & 189. *I. cædator*, Grav.: supposed ♂ described; Kriechbaumer, füzetek, vi. pp. 144 & 145. *I. perfidiosus*, Smith: gregarious habits of ♀; Hudson, Ent. xvi. pp. 215 & 216. *I. deletus* and *albilarvatus*, Wesm., and *lanius*, Grav., and *Eurylabus larvatus*, Grav., noticed from Sweden; Möller, Ent. Tidskr. iv. pp. 92–94.

Amblyteles sibiricus, Mocs., and *hungaricus*, Tischb. Males described; Frivaldsky, Term. füzetek, vi. pp. 147 & 148.

Parasite on *Thera ulicata* figured; Millière, Ann. Soc. L. Lyon, xxix. pl. i. figs. 5 & 6.

Ichneumon curtulus, *melanostigma*, p. 144, and *cordiger*, p. 145, Kriechbaumer, *l. c.*, Hungary; *I. clavipes*, Möller, *l. c.* p. 92, Sweden · [illegible] pp. nn.

Amblyteles 5-*cinctus* (Mocs., MS.), Ala Tau, p. 146, *pana* [illegible]. 147, *jucundus* (Mocs., MS.), Hungary, p. 148, *carnifex*, *erythropygus* [illegible]49, and *gratiosus* (Mocs., MS.), Ala Tau, p. 150, spp. nn., Kriech[illegible] *c.*

Psilomastax violaceus, sp. n., Mocsáry, Ert. Term. Kö[illegible]. 10, Sardinia.

Neotypus intermedius, sp. n., *id. ibid.*, Spain.

Cryptides.

Cryptus quadriguttatus, Grav., noticed from Sweden; Möller, Ent. Tidskr. iv. p. 94.

Spilocryptus fumipennis, Grav. (parasitic on *Saturnia pavonia*), discussed, with a list of Swedish species of *Spilocryptus* and their hosts; Holmgren, Ent. Tidskr. iv. pp. 29–31 & 55.

Hemimachus, Ratz. Critical notes on the species enumerated in Marshall's Catalogue; the genus falls, consisting only of males of *Pezomachus*: Bridgman, Ent. xvi. pp. 49–52.

Pezomachus sedulus, Feisth., ♂ described; Rudow, Ent. Nachr. ix. p. 62. *P. minimus*, Walsh, noticed as destructive to *Leucania unipuncta*, and figured; Riley, Rep. U. S. Ent. Comm. iii. p. 127, pl. ii. figs. 7 & 9.

New species:—

Phygadeuon marshalli (= *procerus* var. 2, Grav.), Bridgman, Tr. E. Soc. 1883, p. 141, Northampton; *P. waigatschensis*, p. 148, *nicalis* and *laticollis*, p. 149, Holmgren, Ent. Tidskr. iv., Waigatz Island.

Cryptus pœcilopus, *hymotomadum*, Perleberg, p. 239, *ætnensis*, S. Europe, p. 240, *flavo-pictus*, Perleberg, *rufifrons*, S. Europe, p. 241, *aculeatus*, Perleberg, *ichneumonoides*, S. Europe, p. 242, *crassicornis*, Perleberg, *collaris*, Thuringia, Alsace, p. 243, *elongatus*, Perleberg, and *lippensis*, Westphalia, p. 244, Rudow, Ent. Nachr. ix.; *C. turkestanicus*, Kriechbaumer, Term. füzetek, vi. p. 150, Ala Tau.

Hemiteles obscurus, p. 142, *submarginatus*, p. 143, *marginatus*, p. 144,

politus, p. 146, *subannulatus*, p. 147, *mixtus*, p. 148, *ruficaudatus*, p. [illegible]næ], *incisus*, p. 150, and *distinctus*, p. 151, Bridgman, *l. c.*, Britain. 245

Theroscopus niger, id. *l. c.* p. 152, Kingussie, Inverness-shire.

Hemimachus piceus, p. 153, *hyponomeutæ*, *rufo-tinctus*, p. 155, *rufipes* [illegible] and *morvatus*, *rufo-cinctus*, p. 158, and *annulicornis* (Marsh., MS., ? = *Pezo-Lept* *juvenilis*, Först.), p. 160, *id. l. c.*, Britain.

antenomachus *brevis* and *hieracii*, id. *l. c.* p. 162, Britain.

Mono

Pimplides.

Rhyssa atrata and *lunator* popularly described; Harrington, Rep. E. Soc. Ont. 1882, pp. 23–25.

Pimpla sp. noticed as destructive to *Orgyia leucostigma*; Clarkson, Canad. Ent. xv. pp. 168 & 169. *P. spuria*, Grav. (?), noticed; Bridgman, Ent. xvi. pp. 251–253. *P. inquisitor* and *conquisitor*, Say, and *Hemiteles* (?) *thyridopterygidis*, Riley, noticed as parasitic upon *Thyridopteryx ephemeriformis*, Steph.; Lintner, Rep. Ins. N. York, i. pp. 84–86.

Lampronota frigida, Cress., noticed and figured; *id. l. c.* p. 145, figs. 35 & 36.

New species:—

Rhyssa semipunctata, Kirby, Tr. E. Soc. 1883, p. 202, Australia, New Zealand.

Ephialtes balanini, Thuringia, and *ascaniæ*, Perleberg, Rudow, Ent. Nachr. ix. pp. 232 & 233.

Pimpla flavipennis, Thuringia, S. Europe, p. 234, *nodosa*, S. Germany, *cruentata*, Thuringia, p. 235, *erythrosoma*, Perleberg, p. 236, *ephippium*, Thuringia, *colorata*, Normandy, p. 237, *rufipes*, Perleberg, and *robusta*, Thuringia, S. Europe, p. 238, *id. l. c.*

Clistopyga truncata, Provancher, Nat. Canad. xiv. p. 13, Canada.

Glypta rugulosa, id. *l. c.* p. 14, Canada; *G. brevicornis*, Rudow, *l. c.* p. 234, Perleberg; *G. genalis*, Möller, Ent. Tidskr. iv. p. 95, Sweden.

Meniscus marginatus, Provancher, *l. c.* p. 15, Canada.

Xylonomus ephialtoides, Kriechbaumer, Term. füzetek, vi. p. 151, Hungary, Germany.

Echthrus rubripes, Provancher, *l. c.* p. 16, Canada.

Bassides.

Metopius dirus, Tiflis, and *falcicornis*, Beyrut, spp. nn., Mocsáry, Ért. Term. Kör. xiii. pp. 12 & 13.

Bassus tibialis, Bridgman, Tr. E. Soc. 1883, p. 170, Worcester; *B. scapulatus*, *cingulatus*, p. 11, and *longicornis*, p. 12, Provancher, Nat. Canad. xiv., Canada: spp. nn.

Tryphonides.

Hyperacmus crassicornis, Grav., ♂ described; Capron, Ent. x[illegible]

New genera and species:—

Brephoctonus, Förster, Verh. Ver. Rheinl. xxviii. [1871] p. 79. *Orthocentroidæ*; type, *Plectiscus imperator*, Grav.

I
wi[ris, 9stus, Holmgren, Ent. Tidskr. iv. p. 154. Allied to *Mesolius*. *A*
ovi[s, dis]*viceps*, sp. n., *l. c.* p. 155, Novaya Zemlya. [pp. 188
te[lus, v]*ematopygus bicolor* and *ruficentris*, Rudow, Ent. Nachr. ix. [Term.
[s, lit]m Alsace and N. France.

Exot[*hus niger*] [d]ahl, Tr. E. Soc. 1883, p. 169, Nor[th] Sicily; *E. brunni-*
ventris, Ru[dow], *l. c.* p. 64, Perleberg.

Mesoleptus variabilis, Provancher, Nat. Canad. xiv. p. 8, Canada.

Eclytus robustus, id. *ibid.*, Canada.

Cteniscus (*Exenterus*) *xanthostigma* and *C. xanthostoma*, Rudow, *l. c.* p. 62, Perleberg.

Exenterus canadensis, Provancher, *l. c.* p. 9, Canada.

Mesolius niger and *junctus*, id. *l. c.* pp. 9 & 10, Canada.

Erromenus marginatus, id. *l. c.* p. 10, Canada.

Chorinæus pulchripes, id. *l. c.* p. 12, Canada.

Orthocentrus albo-fasciatus, id. *l. c.* p. 13, Canada; *O. rivosus*, p. 155, *solitarius*, *carinulatus*, *dispar*, p. 156, *hirticornis*, p. 157, *hilaris* and *laticollis*, p. 158, Holmgren, Ent. Tidskr. iv., Waigatz, &c.

Adelognathus frigidus, id. *l. c.* p. 153, Waigatz.

Polyblastus nigrifrons, id. *l. c.* p. 154, Waigatz.

Ophionides.

Förster, A. Uebersicht der Gattungen und Arten der Familie der Plectiscoiden. Verh. Ver. Rheinl. xxviii. [1871] pp. 71–123.

An important paper, hitherto unnoticed in Zool. Rec. The genus *Plectiscus*, Grav., is elevated into a family, and a great number of new genera and species are tabulated and described.

Ophion undulatus, Grav., var. *giganteus* from Eberswalde described, Rudow, Ent. Nachr. ix. p. 59; *O. macrurus*, Linn. (parasitic on *Telea polyphemus*), noticed and figured; Saunders, Rep. E. Soc. Ont. 1882, p. 17, fig. 11. *O. purgatus*, Say (parasitic on *Leucania unipuncta*), noticed and figured; Riley, Rep. U. S. Ent. Comm. iii. p. 128, pl. ii. fig. 5.

Paniscus cephalotes, Holmgr. (?), noticed as parasitic on *Acronycta psi*; [Miss] Kingsford, Ent. xvi. pp. 69 & 70.

Campoplex. Kriechbaumer reviews this genus, with special reference to the species described by Gravenhorst, [Förster, and Holmgren, and describes several new ones; CB. Regensb. xxxvii. pp. 65–75 & 97–115. A species supposed to be *C. perditor*, Först., is discussed at pp. 113–115.

Limneria rufa and *brischkii*, Bridgm., noticed; Bignell, Ent. xvi. p. 69. [c. 18

Maticollis[, *vitreus*, Walsh., noticed as parasitic on *Leucania unipuncta*, an *Cryptus* Riley, *l. c.* p. 127, pl. ii. fig. 8.

p. 240, *fla*
[berg, *ichn*]*a and species :—*

C[huringi, Förster, Verh. Ver. Rheinl. xxviii. [1871] p. 74. Type, *C. femoralis*, sp. n., *l. c.* p. 75, Aix-la-Chapelle.

Aperileptus, id. *l. c.* p. 75. Type, *Plectiscus albipalpus*, Grav.; add *A. penetrans*, *immundus*, *flavus*, p. 76, *bifuscatus*, *adversarius*, *microspilus*, *spoliator*, *vilis*, *fungicola*, *placidus*, *tutorius*, *vacuus*, *tricinctus*, p. 77,

p. [illegible]nc],
[illegible]opsis, vanus, custoditor, frontalis, impacatus, exstirpator, via[illegible] 245
Pezo[illegible]lagiatus, euryzonus, meritus, secretus, p. 78, *subsignatus, vi*[illegible]
—[illegible] *labilis, notabilis, sternoxanthus, conformis, inamœnus, filicumpipe*[illegible]
and *inc*[illegible], p. 79, spp. nn., Aix-la-Chapelle. *Pezo-*

Holomeris, Förster, *l. c.* p. 80. Type, *H.* [illegible], sp. n., *l. c.* p. 81, Aix-la-Chapelle.

Entypoma, id. *l. c.* p. 81. Type, *H. robustum*, sp. n., *l. c.* p. 82, Aix-la-Chapelle.

Blapticus, id. *l. c.* p. 82. Type, *B. leucostomus*, sp. n., *l. c.* p. 83, Aix-la-Chapelle.

Dialipsis, id. *l. c.* p. 83. To include *D. intermedia, mesomelæna, conjunctus, exilis, pallida, diversa*, and *observatrix*, spp. nn., Aix-la-Chapelle.

Miomeris, id. *l. c.* p. 91. Type, *M. aquisgranensis*, sp. n., *l. c.* p. 92, Aix-la-Chapelle.

Aniseres, id. *l. c.* p. 92. Types, *A. pallipes* and *lubricus*, spp. nn., *l. c.* p. 93, Aix-la-Chapelle.

Idioxenus, id. *l. c.* p. 94. Type, *Megastylus mediator*, Schiödte; add *I. coxalis, clypeatus, polymerus, propinquus, invalidus, variator, conspicuus, inquilinus, inæqualis, intricator*, and *tetraglyptus*, spp. nn., *l. c.* p. 95, Aix-la-Chapelle.

Dicolus, id. *l. c.* p. 96. To include *D. pectoralis, subtiliventris, excubitor*, and *insectator*, spp. nn., *l. c.* p. 97, Aix-la-Chapelle.

Apoclima, id. *l. c.* p. 97. Type, *A. signaticorne*, sp. n., *l. c.* p. 98, Aix-la-Chapelle.

Atelente, id. *l. c.* p. 98. Type, *A. linearis*, sp. n., *l. c.* p. 99, Aix-la-Chapelle.

Polyaulon, id. *l. c.* p. 99. To include *P. incertus, fuscipes, pleuralis, fusculus, timidus, contrarius, isomorphus, atratus, coxalis, ultorius*, and *rufipes*, spp. nn., *l. c.* p. 100, Aix-la-Chapelle.

Hemiphanes, id. *l. c.* p. 101. Types, *H. flavipes* and *gravator*, spp. nn., *l. c.* pp. 101 & 102, Aix-la-Chapelle.

Myriarthrus, id. *l. c.* p. 102 (= *Helictes*, Hal., *nec* Gray). Type, *Plectiscus erythrostoma*, Grav.; add *P. flavo-pictus*, Grav., and *M. rufipleuris, cingulator* and *æmulus*, spp. nn., *l. c.* p. 103, Aix-la-Chapelle.

Symphylus, id. *l. c.* p. 105. Type, *S. hadrodactylus*; add *S. politus*, spp. nn., *l. c.* p. 106, Aix-la-Chapelle.

Eusterinx, id. *l. c.* p. 107. To include *E. oreophila*, Engadine, *obscurella, subdola, argutula, vigil, scitula, basalis, ambigua, diversa, lævipleuris, divulgata, intermedia, subcincta*, p. 108, *oligomera, fulvicornis, speculifera, mœsta, fulvicincta*, and *tennis*, spp. nn., p. 109, Aix-la-Chapelle.

Pantisarthrus, id. *l. c.* p. 109. To include *P. inæqualis, luridus*, and *ochropus*, spp. nn., *l. c.* p. 110, Aix-la-Chapelle.

Entelechia, id. *l. c.* p. 110. Type, *E. suspiciosa*, sp. n., *l. c.* p. 111, Aix-la-Chapelle.

Gnathochorisis, id. *l. c.* p. 111. Type, *G. flavipes*, sp. n., *l. c.* p. 113, Boppard.

Proclitus, id. *l. c.* p. 113. To include *P. fulvicornis, inquietus, cupidus, providus, absconditus*, p. 114, *exilis, autumnalis, evacuator, contemptibilis, periculosus, fulvipectus, attentus, punctatus, curiosus, instigator, conturbator,*

I
wi[illegible]*ris, quæsitorius, fossulatus, dimidiatus, rudis*, p. 115, *inferior, meso-*
ov[illegible]*s, displicitus, definitus, zelator, visitator, cautus, macrurus, perditorius,*
te[illegible]*lus, validus, unicinctus, spectabilis, grandis*, p. 116, *caudiger, pallens,*
[illegible]*s, litigiosus, infimus, albidipes, stenogaster, exiguus, humilis, bicarina-*
tus, gracilentus, procerulus, subsulcatus, clypearis, marginatus, melanoce-
phalus, p. 117, *inæstimabilis, denticulutus, substriatus, leptosomus, sincerus*, and *grandis*, p. 118, spp. nn., Aix-la-Chapelle.

Symplecis, Förster, *l. c.* p. 118. To include *S. alpicola*, Splügen, *xantlostoma*, p. 119, and *zonaria*, Aix-la-Chapelle, p. 120, spp. nn.

Cyrtocentrus, Provancher, Nat. Canad. xiv. p. 6. Differs from *Plectiscus* in the ovipositor being recurved at the tip. Type, *C. quebecensis*, sp. n., *ibid.*, Canada.

Osprynchotus elegans, Caucasus, and *syriacus*, Syria, Mocsáry, Ert. [illegible]rm. Kör. xiii. pp. 11 & 12.

Ophion variegatum [*-tus*], Rudow, Ent. Nachr. ix. p. 59, Alsace; *O. lineatus* and *nigricans*, Cameron, Tr. E. Soc. 1883, pp. 192 & 193, Hawaii, &c.

Anomalon flavitarse, p. 57, *laticeps*, South Germany, *rufiventre*, Alsace, and *luteum*, Eberswalde, p. 58, Rudow, *l. c.*

Campoplex geometræ, Perleberg, and *rufinus*, Alsace, p. 60, *albitarsis*, Perleberg, p. 246, Rudow, l. c.; *C. punctus*, Munich, p. 101, *lacunosus*, p. 104, *limiventris*, Tegernsee, p. 106, *auritus*, Munich, p 108, and *lateralis*, Hohenschwangau, p. 111, Kriechbaumer, CB. Ver. Regensb. xxxvii.

Sagaritis incisa, Bridgman, Tr. E. Soc. 1883, p. 165, Britain.

Limneria spectabilis, Perleberg, and *normannica*, North France, Rudow, *l. c.* p. 61; *L. polynesialis*, Maui, and *blackburni*, Hawaii, Cameron, *l. c.* pp. 191 & 192.

Nemeritis rufipes, Bridgman, *l. c.* p. 166, Britain.

Atractodes nigerrimus, Holmgren, Ent. Tidskr. iv. p. 151, Novaya Zemlya.

Mesochorus pectinipes and *hirsutus*, Bridgman, *l. c.* pp. 166 & 168, Britain; *M. politus* (? = *atriventris*, ♀, Cress.), *humeralis*, p. 4, *jucundus*, and *areolatus*, p. 5, Provancher, Nat. Canad. xiv., Canada.

Plectiscus nigritus [*-ta*], *gilvus, infirmus, communis, helvolus, humeralis, tener, canaliculatus, incertus, subtilis, subsimilis, tenuicornis, parvulus, coxator, fulvus*, p. 86, *fraternus, conjunctus, melanocerus, posticatus, amicalis, nuptialis, petiolatus, pungens, terebrator, vagator, mœrens, brachycerus, flavicoxis, xanthoneuris, ambulator*, p. 87, *subangulatus, mesoxanthus, determinatus, flavizonus, eversorius, deterior, habilis, sodalis, distinctus, proximus, erythropygus, mendicus*, p. 88, *agitator, præpositus, manticola, connexus, subcurvatus, crassicornis, binodulus, cinctulus, nefastus, integer*, p. 89, *flavocerus, longicornis, fuscicornis, flavicentratus, spilotus, subtilicornis, ichnaelanostomus, tantillus, parviceps, iniquus, abditus, elumbis, filiformis, subcompletus*, p. 90, *ivanis, monochrocerus, ambiens, bidentulus, cooperator, enixus, discolor, jejunus, prædatorius*, and *disjunctus*, p. 91, Förster, Verh. Ver. Rheinl. xxviii. [1871], Aix-la-Chapelle; *P. niger*, Provancher, *l. c.* p. 6, Canada.

Megastylus nigriventris, conformis, retro-ligatus, fuscicornis, pumilio, facialis, leptoderus, and *pauxillus*, Förster, *l. c.* p. 105, Aix-la-Chapelle.

Exetastes ruficornis, Rudow, *l. c.* p. 245, Perleberg.

Banchus zonatus, South Europe, and *robustus*, Thuringia, *id. l. c.* [illegible] & 246.

Braconidæ.

List of *Braconidæ* of the neighbourhood of Frankfurt-on-Main (213 species); Von Heyden, Ber. senck. Ges. 1882–83, pp. 238–254.

Rhogas reticulator, Nees, noticed; Bignell, Ent. xvi. p. 69.

Apanteles glomeratus, Linn.: 142 cocoons obtained from a single larva of *Pieris brassicæ*; id. *l. c.* p. 263. *A. fraternus*, Reinh. (new to Britain), discussed; Bignell & Fitch, Ent. xvi. pp. 166 & 167: arrangement of cocoons; Bignell, Rep. Plym. Inst. viii. p. 283.

Microgaster (*Apanteles*) *militaris*, Walsh, and other species, noticed as parasitic on *Leucania unipuncta*, and *A. congregatus*, Say, figured; Riley, Rep. U. S. Ent. Comm. iii. pp. 126 & 127, pl. ii. fig. 6.

Perilitus dimidiatus, Cress., redescribed; Thomas, Rep. Ins. Illin. xi. p. 14.

Pachylomma grande, Grav., redescribed; Rudow, Ent. Nachr. ix. pp. 246 & 247.

Synaldis distracta, Nees, (?), parasitic upon *Phytomyza nigricornis*, noticed and figured; Westwood, Gard. Chron. (2) xix. p. 593, fig. 95.

New species:—

Bracon nitidus, Provancher, Nat. Canad. xiv. p. 16, Canada.

Opius politus, id. *ibid.*, Canada.

Microctonus punctatus, id. *l. c.* p. 17, Canada.

Rhyti [*do*]*gaster parvus*[*-va*], id. *l. c.* p. 18, Canada.

Alysia astigma and *rubriceps*, id. *ibid.*, Canada.

Evaniidæ.

Evania sericea, sp. n., Cameron, Tr. E. Soc. 1883, p. 191, Oahu, Hawaii.

Aulacus fasciatus, sp. n., Kriechbaumer, Term. füzetek, vi. p. 143, Hungary.

Chalcididæ.

Kirby, W. F. Remarks on the Genera of the Subfamily *Chalcidinæ*, with Synonymic Notes and Descriptions of New Species of *Leucospidinæ* and *Chalcidinæ*. J. L. S. xvii. pp. 53–76, pls. iii. & iv.

The *Chalcidinæ* are divided into 33 genera, with indications of types, and figures of details. The following synonymy occurs: [illegible] *affinis*, Say (= *basalis*, Westw., and *canadensis*, Walk.), *ant*[illegible] (= *gambeyi*, Maindr.); *Smicra abdominalis*, Walk. (= *ambi*[illegible] p. 113[illegible], *femorata*, Fabr. (= *punctata*, Fabr., ? *fasciata*, Oliv., *subpun*[illegible]k., and *nigro-picta*, Cress.), *captiva*, Smith (= *adaptata*, Walk.), *cupidata*, Fabr. (= *melanoptera*, Walk.); *Hockeria dargelasi*, Latr. (*tibialis*, Walk.), *rufipes*, Oliv. (= *armata*, Panz., and *bispinosa*, Fonsc., *nec* Fabr.); *Halticella tarsalis*, Walk. (*nec* Motsch.), renamed *Hockeria* (?) *walkeri*;

P
Walk. (?) *figurator*, Walk. (= *nigricola*, Walk.), *H.* (?) *nyssa*, Walk. (= *ovi*-*enus*, Walk.); *Chalcis euplœæ*, Hope (= *lasus*, *inclinator*, and *obscur*-*tel*-, Walk.), *finator*, Walk. (= *mansueta*, Walk.), *amenocles*, Walk. (= *dyctor*, Walk., 1862, *nec* 1841, and *varipes*, Walk.), *flavipes*, Fabr. (*nec* Panz., but = *ovata*, Say, *annulipes*, Walk., ? *integra*, Hald., *incerta*, Cress., and *panamensis*, Holmgr.), and *C.* (?) *vicaria*, Walk. (= *eurytomoides*, Walk.); *C. concreta* and *concitata*, Walk., are probably sexes.

Saunders, [Sir] S. S. Descriptions of 3 New Genera and Species of Fig Insects allied to *Blastophaga*, from Calcutta, Australia, and Madagascar, with notes on their parasites and on the affinities of the respective races. Tr. E. Soc. 1883, pp. 1–27, pls. i.–iii., and P. E. Soc. 1883, pp. v. & vi.

Includes very important notes on structure and habits. The writer divides the *Cynipidæ* into *Sycophagides*, *Cecidophagides*, and *Heterophagides*, or aphidivorous *Cynipidæ*; and divides the *Sycophagides* into *Prionastomata* [*Prionost-*] (including the genera *Blastophaga*, Grav., *Agaon*, Dalm., *Sycocrypta*, Coq., *Eupristina*, *Plistodontes*, and *Kradibia*, Saund.), and *Aploastomata* [*Haplost-*] (including *Sycophaga*, Westw., and *Apocrypta*, Coq.).

——. On the *Cynips caricæ* of Hasselquist, and other Fig Insects allied thereto, with description of a new species from Australia. *L. c.* pp. 383–392, pl. xviii.

Cynips caricæ, Hasselq., proves to be an *Idarnella* [probably = *ficarius*, Mayer, and *Sycoscaptella* (?) *4-setosa*, Westw.]; the insect and details are represented, figs. 1 & 1*a*, *b*.

Westwood, J. O. Further Descriptions of Insects Infesting Figs. Tr. E. Soc. 1883, pp. 29–47, pls. iv.–x.

Includes remarks on papers by Walker & Mayer; and descriptions of new genera and species of *Hymenoptera* infesting *Ficus indica*, *religiosa*, and *asperrima* in India and Ceylon.

——. Further Notice concerning the Fig Insects of Ceylon. *L. c.* pp. 375–380.

Discusses *Sycocaptella* (?) *4-setosa*, Westw. (probably = *ficarius* Mayer), figs. 1 & 1 *a–f.*, and *Apocrypta perplexa*, Coq., figs. 2 & 2 *a–g*.

Note on the structure of the abdomen in the *Chalcididæ*; André, P. E. Soc. 1883, p. xxiii.

Review of Mayer's paper on Fig Insects; F. Müller, Kosmos, xii. pp. 310–314.

N[illegible]s on caprification; Hemsley, Nature, xxvii. pp. 584 & 586, and [illegible]ocerus, [illegible], P. E. Soc. 1883, pp. xxxi. & xxxii.

[illegible]elanostomis *mexicana*, Walk., noticed and figured; Cameron, Biol. Centr. [illegible]ubcompleta, p. 76, pl. iv. figs. 11 & 11 *a–c*.

[illegible]ixus, *discoovata*, Say, noticed; Lintner, Rep. Ins. N. York, i. p. 86.

[illegible]r. Rhein[illegible] *bethyloides*, Walk. Genus and species redescribed at length; W. Canood, Tr. E. Soc, 1883, pp. 31 & 32, pl. iv. figs. 1–8.

Perilampus violaceus, Dalm., redescribed; Lintner, Rep. Ins. N. York, i. pp. 146 & 147.

Copidosoma truncatellum, Dalm. (?), noticed and figured; Riley, [*loc.*], Rep. Dep. Agric. 1883, p. 121, pl. xi. fig. 4. 215

Eupelmus alleynii, French. Life-history, ravages, &c.; French, Rep. Illin. xi. pp. 73–81.

Pteromalus sp. noticed as parasitic on *Thyridopteryx ephemeriformis*; Lintner, *l. c.* p. 86. *P. puparum*, Linn.: transformations described; Riley, *l. c.* pp. 111 & 112 [*cf.* also Thomas, Rep. Ins. Illin. xi. pp. 35 & 36].

Arthrolytus punctipollis, Möll., parasitic on *Anobium paniceum*, Linn., discussed; Möller, Ent. Tidskr. iv. pp. 104 & 223.

Semiotellus destructor, Say, parasitic on Hessian Fly, redescribed and figured; Packard, Rep. U. S. Ent. Comm. iii. pp. 216–218, pl. iv. fig. 1.

Glypha sp. parasitic on *Lozotænia rosaceana*, Harr. Transformations described; Thomas, Rep. Ins. Illin. xi. pp. 13 & 14.

Elasmus sp. parasitic on *Acrolepia citri*, Mill.; Laugier, C.R. xcvii. p. 760.

Trichogramma pretiosum, Riley, parasitic upon eggs of *Nematus ventricosus* and *Aletia argillacea*; Lintner, P. Am. Ass. xxxi. pp. 471 & 472, and Psyche, iv. pp. 48–51.

New genera and species:—

Anacryptus, Kirby, J. L. S. xvii. p. 56, pl. iii. figs. 8 & 9. Allied to *Chalcitella*; hind femora comparatively narrow, strongly punctured, serrated beneath, and with a large tooth near the base; hind tibiæ with a large obtuse tooth near the base on the outside. Type, *Epitranus impulsator*, Walk.

Arretocera, id. *ibid.* figs. 10 & 11. Allied to *Epitranus*; head narrower, antennæ 13-jointed, scape about two-fifths of total length, hind femora armed with many very minute teeth. Type, *E. albipennis*, Walk.

Thaumapus, id. *ibid.* figs. 12–14. Allied to *Smicra*; petiole half the length of the abdomen; hind coxæ stout, much longer than the petiole. To include *S. masus* and *decora* (type), Walk., and *T. walkeri* (? = *S. luteipennis*, ♂, Walk.), sp. n., *l. c.* p. 74, Upper Amazons (St. Paulo).

Eniaca, id. *l. c.* p. 57, pl. iii. fig. 18. Differs from *Dirrhinus* by its 13-jointed antennæ, with a long slender scape and thicker flagellum. Type, *Chrysis* (?) *hesperidum*, Rossi.

Epinæus, id. *l. c.* p. 58, pl. iii. figs. 24 & 25. Allied to *Conura*; antennæ 14-jointed, inserted about the middle of the face; abdomen produced into a long pointed cone; hind femora beneath with rather large teeth, that at the base much longer than the others; nervures of the wings indistinct. Type, *Smicra dux*, Walk.

Stypiura, id. *l. c.* p. 59, pl. iii. figs. 28–30. Allied to *Conura*; antennæ 11-jointed, placed high up on the face; abdomen smooth and shining, produced into a rather stout stylus covered with shaggy hair; hind femora with one large and six smaller teeth. Type, *Chalcis conigastra*, Perty (= *Halticella erythrotelus*, Walk.).

Aspirhina, id. *l. c.* p. 60, pl. iv. figs. 3–5. Antennæ 11-jointed, pilose; scutellum with a long straight spine; abdomen pen-shaped. Type, *Halticella dubitator*, Walk.

Proctoceras, Kirby, *l. c.* p. 60, pl. iv. figs. 6–8. Antennæ 13-jointed, clothed with fine bristles; abdomen ovoid, and provided with a slender exserted ovipositor slightly longer than the abdomen itself. Type, *Smicra leucotelus*, Walk. (*Chalcis caudatus*, Guér., probably also belongs to this genus).

Thaumatelia, id. *ibid.* figs. 9 & 10. Antennæ 11-jointed; abdomen produced into a very long, slender stylus, nearly twice as long as the basal part, and fringed on each side with short hairs. Type, *Chalcis separata*, Walk.

Epitelia, id. *l. c.* p. 61, pl. iv. figs. 11 & 12. Allied to *Phasgonophora*; antennæ 13-jointed, much stouter; abdomen shorter and stouter; stylus about equal in length to the remainder of the abdomen. Type, *Chalcis stylata*, Walk.

Megalocolus, id. *ibid.* figs. 13–15. Allied to *Halticella* and *Phasgonophora*; antennæ thick, pubescent, 12-jointed, inserted in the middle of the face; abdomen subpetiolate, the first joint fully half the length of the remainder; abdomen of ♀ terminating in a long stylus set with bristles, and about as long again as the abdomen itself. To include *Halticella ducator* (type), *ensator* (= *tentator*), *properator*, *signator*, *notator*, and *gladiator*, Walk., &c.

Pseudochalcis, id. *l. c.* p. 62, pl. iv. fig. 16. Head, thorax, and scutellum covered with very large depressed punctures; antennæ inserted high up on the face; scutellum with a short, thick, smooth projection behind. Type, *Halticella declarator*, Walk.

Trichoxenia, id. *ibid.* figs. 17–20. Antennæ inserted near the mouth, scutellum armed behind with a long straight spine, abdomen with short broad stylus. Types, *Halticella cineraria* and *subfasciata*, Walk.

Stomatoceras, id. *ibid.* figs. 21–23. Antennæ 11-jointed, inserted near the mouth; scape very long and strongly curved; wings variegated. Type, *Halticella liberator*, Walk.

Antrocephalus, id. *l. c.* p. 63, pl. iv. figs. 24–26. Allied to last; antennæ 12-jointed, scape very long, and nearly straight. Types, *Halticella fuscicornis* and *divisicornis*, Walk.

Neochalcis, id. *ibid.* figs. 30–32. Allied to *Euchalcis*; antennæ 13-jointed, short, pubescent, scape rather short, inserted opposite the lower border of the eyes. Type, *Halticella osmi*[*i*]*cida*, Saund. (will also include *Euchalcis hematomera*, Duf.).

Eupristina, Saunders, Tr. E. Soc. 1883, p. 5. Allied to *Blastophaga*. Type, *E. masoni*, sp. n., *l. c.* p. 6, pl. i., Calcutta.

Pleistodontes, id. *l. c.* p. 8. Allied to *Blastophaga*. Type, *P. imperialis*, sp. n., *l. c.* p. 10, pl. ii., Australia.

Kradibia, id. *l. c.* p. 23. Allied to *Blastophaga*. Type, *K. cowani*, sp. n., *l. c.* p. 25, pl. iii., Madagascar.

Walkerella, Westwood, Tr. E. Soc. 1883, p. 32. Placed after *Sycobia*. Type, *W. temeraria*, sp. n., *l. c.* p. 33, pl. iv. figs. 9–12, India (= *Sycobia bethyloides*, neuter (?) or worker (?), Walk.

Sycobiella, id. *l. c.* p. 33. Type, *S. saundersi*, sp. n., *l. c.* p. 34, pl. v. figs. 13–19, Calcutta.

Sycoscapter (Saunders, MS.), *id. l. c.* p. 34. Type, *S. insignis*, sp. n., *l. c.* p. 35, pl. v. figs. 20–29, Calcutta; add *S. gibbus*, Saunders, *l. c.* p. 25,

Madagascar, and *S. monilifer*, figs. 58–62, and *gracilipes*, figs. 63–66, spp. nn., Westwood, *l. c.* p. 41, pl. viii., Ceylon.

Sycoscaptella, Westwood, *l. c.* p. 36. Type, *S. affinis*, sp. n., *ibid.* pl. vi. figs. 30–35, Calcutta; add *S.* (?) *anguliceps*, pl. ix. figs. 67–75, and *S.* (?) *4-setosa*, pl. x. figs. 76–85, spp. nn., *id. l. c.* p. 43.

Idarnella, id. *l. c.* p. 37. Allied to *Idarnes*. Type, *I. transiens*, Walk. (figured, pl. vi. figs. 36–42); add *I. aterrima*, Saunders, *l. c.* p. 389, pl. xviii. figs. 2*a–c* (details), Sydney.

Otitesella, Westwood, *l. c.* p. 39. Allied to *Sycoscapter*. Types, *O. digitata*, figs. 43–51, and *religiosa*, figs. 52–57, spp. nn., *l. c.* p. 40, pl. vii., Ceylon.

Moranila, Cameron, Tr. E. Soc. 1883, p. 188. Allied to *Eunotus*, Walk. (= *Megapelte*, Först.); petiole longer, tibiæ curved, and prothorax longer. Type, *M. testaceiceps*, sp. n., *ibid.*, Oahu.

Solindenia, id. *l. c.* p. 189. Allied to *Calosoter*; frons ridged at the insertion of the antennæ, tarsi setose, eyes much longer and more converging. Type, *S. picticornis*, sp. n., *ibid.*, Oahu.

Leucaspis tricolor, South Africa, *mysolica*, Mysol, p. 69, and *tomentosa*, St. Thomas, Tapajos, p. 70, Kirby, J. L. S. xvii.

Smicra quadridentata, Guatemala, and *championi*, pl. v. fig. 1, Panama, Cameron, Biol. Centr. Am. *Hym.* pp. 79 & 80; *S. rufipes*, Georgia, p. 70, *igneoides*, United States, *foveata* (? = *contacta*, Walk.), Amazons, p. 71, *pera*, Brazil, *incerta* (= *certa*, ♀, Walk.), Amazons, p. 72, *decipiens*, Villa Nova, and *burmeisteri*, Argentine Republic, p. 73, Kirby, *l. c.*

Phasgonophora (?) *batesi*, id. *l. c.* p. 74, Santarem.

Hockeria (?) *canariensis*, id. *ibid.*, Canary Islands.

Chalcis callipus, Japan, p. 75, *hearseyi*, Barrackpore, India, *atrata*, Queensland, *cowani*, Madagascar, and *wollastoni*, Canary Islands, p. 76, *id. l. c.*

Epitranus lacteipennis, Cameron, Tr. E. Soc. 1883, p. 187, Oahu.

Megaspilus lucens, Provancher, Nat. Canad. xiv. p. 33, Canada.

Callimome longicauda, id. *l. c.* p. 34, Toronto; *C. antipoda*, Kirby, Tr. E. Soc. 1883, p. 202, New Zealand.

Torymus pruni, Cameron, Tr. E. Soc. 1883, p. 196, Scotland; *T. heyeri*, Wachtl, Wien. ent. Z. ii. p. 35, Bohemia.

Lochites mayri, id. *l. c.* p. 9, Vienna.

Encyrtus bucculatricis, Howard, Rep. Ins. N. York, i. p. 160, fig. 43, United States.

Coccophagus flavo-scutellum [*flavi-scutellatus*], Ashmead, Florida Agriculturist, iv. p. 65 [1881] (*cf.* Psyche, iv. p. 15), parasitic on *Lecanium hesperidum* in Florida.

Eupelmus flavipes, Cameron, *l. c.* p. 190, Oahu.

Spalangia syrphi and *S.* (or *Pteromalus*) *quadrimaculatus*, Florida Dispatch, 7 July, 1881 (*cf.* Psyche, iv. p. 16), Florida.

Pteromalus doumeti, Fairmaire, R. Z. (3) vii. p. 207, note, Tunis.

Cirrospilus flavicinctus, Riley, Rep. Ins. N. York, i. p. 1[illegible]12, United States.

Eulophus gummiferæ, Fairmaire, *l. c.* p. 207, note, Tunis.

Theocolax canadensis, Provancher, Nat. Canad. xiv. p. 34, Canada.

Proctotrypidæ.

Platygaster sp. noticed as destructive to canker-worms; Riley, Rep. U. S. Ent. Comm. iii. p. 176. *P.* sp. destructive to *Cecidomyia salicis-batatus*, noticed and figured; Kellicott, Bull. Buff. Nat. Field Club, March, 1883 (*cf.* Psyche, iv. p. 79). *P. error*, Fitch (?), parasitic on Hessian Fly, redescribed and figured; Packard, Rep. U. S. Ent. Comm. iii. pp. 219 & 220, fig. 9.

Microdes carinoides, Cress., parasitic on *Eccopsis malana*, Fern., redescribed; Thomas, Rep. Ins. Illin. xi. p. 18.

Parasierola, g. n., Cameron, Tr. E. Soc. 1883, p. 197. Allied to *Sierola*, but with radial cellule open. Type, *P. testaceicornis*, sp. n., *ibid.*, Brazil.

Acropiesta (?) *nigriceps*, sp. n., *id. l. c.* p. 195, Gloucester.

Cynipidæ.

Beyerinck, M. W. Beobachtungen über die ersten Entwicklungsphasen einiger Cynipidengallen. Verh. Ak. Amst. xxii. pp. iv. & 198, pls. vi. (abstract, Schlechtendal, Z. Naturw. lvi. pp. 97–102).

An exhaustive work, containing the author's observations on 7 different species of ga[ll]

Möller, C[.] F. [C]ontribution to the Knowledge of Parasitic Life in Galls. [Tra]nsl[ated] by B. P. Manu from Ent. Tidskr. iii. pp. 182–186. Psyche, iv. pp. 89–91. [*Cf.* Zool. Rec. xix. *Ins.* p. 123.]

Paszlavszky, J. Beiträge zur Biologie der Cynipiden. Wien. ent. Z. ii. pp. 129–132 & 171–174.

The *Cynipidæ*, being greatly exposed to the attacks of parasites, require a considerable amount of protection. The agamous forms are sluggish in their habits; protective resemblance is common among them, and they frequently simulate death. Many *Cynipidæ* have a strong odour, generally, but not always, resembling that of *Cimex*. The sexual forms are extremely active. Habits, the influence of temperature, and hibernation, are also discussed.

On the habits of the *Cynipidæ*; Beijerinck, Ent. Tijdskr. xxvi. pp. xiii.–xviii.

Notes on oak-galls at Kew: Rolfe, Ent. xvi. pp. 29–32.

List of *Cynipidæ* of Hungary (68 species), with notes on habits, &c.; Paszlavszky, Term. füzetek, vi. pp. 152–161.

Spathogaster verrucosus, Schlecht., recorded as new to Scotland; Cameron, P. N. H. Soc. Glasg. v. p. 158.

Cynips saltatorius, H. Edw. Jumping of galls noticed; Riley, P. U. S. Nat. Mus. ii. pp. 634 & 635.

Ægilips. Synopsis of British species; Cameron, Tr. E. Soc. 1883, p. 374.

New genera and species:—

Balna, Cameron, Biol. Centr. Am. *Hym.* p. 73. Allied to *Aspi[do]cera*, Dalm.; thorax smooth, scutellum not spined, and with only a single basal

fovea; radial cellule completely closed. Type, *B. nigriceps*, sp. n., *l. c.* p. 74, Guatemala.

Neralsia, Cameron, *l. c.* p. 74. Intermediate between the *Onychina* and *Figitina*. Type, *N. rufipes*, sp. n., *ibid.* pl. iv. figs. 9 & 9*a*, *b*.

Diastrophus 5-costatus, Provancher, Nat. Canad. xiv. p. 19, Canada.

Cynips championi, *imitator*, fig. 8, p. 70, and *guatemalensis*, figs. 7 & 7*a*, pl. iv. p. 71, Cameron, Biol. Centr. Am. *Hym.*, Guatemala (galls only).

Synergus filicornis, pl. iv. figs. 10 & 10*a*, and *dorsalis*, id. *l. c.* p. 72, Guatemala.

Cothonaspis allotriiformis, id. *l. c.* p. 73, Mexico.

Liopteron westwoodi, id. *l. c.* p. 75, pl. iv. figs. 12 & 12*a*, Panama.

Allotria ruficollis, *ruficeps*, p. 365, *curvicornis*, *mullensis*, p. 366, *salicis*, and *piceo-maculata*, p. 367, *id.* Tr. E. Soc. 1883, Scotland.

Cleidotoma minima, Provancher, *l. c.* p. 20, Canada.

Psichacra glottiana, *similis*, Clyde, p. 368, and *marshalli*, Barnstaple, p. 369, Cameron, *l. c.*

Trybliographa nigricornis and *testaceipes*, id. *l. c.* pp. 369 & 370, Scotland.

Erisphagia longipes, id. *l. c.* p. 371, Spain.

Melanips femoralis, id. *ibid.*, Sutherlandshire.

Ægilips scotica, Glen Moriston, *ruficornis*, Bishopton, p. 372, and *striolata*, Glasgow, p. 373, *id. l. c.*

Siricidæ.

The larvæ of several N. American species are briefly noticed; Thomas, Rep. Ins. Illin. x. pp. 70 & 71.

Cameron, Biol. Centr. Am. *Hym.* pp. 68–70, notices *Sirex* (2 species), *Derecyrta* (1), and *Oryssus* (2), from Central America.

Derecyrta flavipes, Phil., noticed; Kirby, Tr. E. Soc. 1883, pp. 202 & 203.

Derecyrta rugifrons, sp. n., Cameron, Biol. Centr. Am. *Hym.* p. 68, pl. iii. fig. 13, Costa Rica.

Oryssus nigricans, sp. n., *id. l. c.* p. 69, pl. iii. figs. 14 & 14*a*, *b*, Guatemala.

Tenthredinidæ.

Brischke, C. G. A. Beobachtungen über die Arten der Blatt- und Holzwespen. 2te Abtheilung. Schr. Ges. Danz. (2) v. (4) pp. 201–328, 8 pls.

Edited by Brischke from Zaddach's posthumous MSS. The first part, including *Nematus*, appears in Schr. Ges. Königsberg. This second part includes *Nematidæ* (*Cryptocampus*, *Diphadnus*, *Leptopus*, *Cladius*, *Dineura*, *Leptocera*), *Lophyridæ* (*Lophyrus*, *Monoctenus*), *Doleridæ* (*Dolerus*), *Selandriidæ* (*Emphytus*, *Harpiphorus*, *Phyllotoma*, *Fenella*, *Fenusa*, *Athalia*, *Hoplocampa*, *Blennocampa*, *Eriocampa*, *Pœcilosoma*, *Selandria*), *Tenthredinidæ* (*Taxonus*, *Strongylogaster*, *Pachyprotasis*, *Macrophya*, *Allantus*, *Eniscia*, *Synarema*, *Perineura*, *Tenthredo*), *Xyelidæ* (*Xyela*), *Siricidæ*

(*Cephus*, *Sirex*, *Xyloterus*, *Xiphydria*). Most of the known species are noticed in detail, and generally redescribed. Many larvæ are figured, including, besides those of genera already mentioned, those of *Abia fasciata* and *Schizocera* (*Cyphona*) *geminata*, Linn. Much synonymy is given, and several new species are described.

Cameron, Biol. Centr. Am. *Hym.*, groups the Central American *Tenthredinidæ* as follows :—

TENTHREDININA. Tenthredinides: *Macrophya* (1). Selandriides: *Siobla* (1), *Strongylogaster* (28), *Selandria* (11), *Monophadnus* (21), *Blennocampa* (6), *Pœcilosoma* (1), *Emphytus* (2).

HYLOTOMINA. *Hylotoma* (18), *Dielocera* (4), *Ptilia* (4), *Sericocera* (12), *Pachylota* (1).

SYZYGONINA. Syzygonides: *Incalia* (1). Lobocerides: *Corynophilus* (1), *Lobocera* (8), *Acordylocera* (1), *Perantherix* (2), *Thulea* (1).

PERREYINA. *Lophyroides* (5), *Perreyia* (3), *Decameria* (8).

LYDINA. *Pamphilius* (2).

CEPHIDÆ. *Cephus* (1).

Critical analysis of W. F. Kirby's list of *Tenthredinidæ*, from *Cimbex* to *Lophyrus* ; Dalla Torre, Ent. Nachr. ix. pp. 117–123.

Supplement to the list of French *Tenthredinidæ* ; Puton, Rev. d'Ent. ii. pp. 15 & 16.

On destructive *Tenthredinidæ* in France in 1882 ; *id. l. c.* p. 254.

Preliminary list of the *Tenthredinidæ* of the Aube; Antessanty, Feuill. Nat. iv. pp. 7–9.

Parthenogenesis in *Tenthredinidæ* discussed. Three kinds are recognized : (1) pure, in species no males of which are ever produced ; (2) mixed, in species the males of which are extremely rare ; and (3) facultative, in species which are only occasionally or potentially parthenogenetic. An account of some incomplete experiments in rearing *Lophyrus rufus* is added. Von Stein, Ent. Nachr. ix. pp. 1–8.

The larvæ of 25 North American *Tenthredinidæ* are briefly described or noticed ; Thomas, Rep. Ins. Illin. x. pp. 63–70.

Cryptocampus saliceti, Fall., *Dolerus pratensis*, Linn., var. *testaceus*, *Emphytus viennensis*, Schrank, var. *nigricoxis*, *Allantus viduus*, Rossi, var. *unifasciatus*, and *Allantus frauenfeldi*, Gir., var. *montanus*, noticed from Sicily ; Destefani, Nat. Sicil. iii. pp. 10–12.

Cimbicinæ.

Zaraea fasciata, Linn. Notes on embryology, parthenogenesis, &c. ; *cf.* (and Vi[illegible] J. A., *Insecta*, General Subject, *suprà*, p. 7.

obscurat[illegible]cea, Linn. Larva described ; Von Stein, Ent. Nachr. ix. Brischke p. 143, *[illegible]rticornis*, Cameron, figured by him ; Biol. Centr. Am. *Hym.* pl. [illegible]enteric[illegible]6 & 6*a-e*.

Abia hungarica, Hungary, and *sibirica*, Siberia, spp. nn., Mocsáry, Ert. Term. Kör. xiii. pp. 1 & 3.

Corynophilus ruficollis, sp. n., Cameron, *l. c.* p. 53, Panama.

Hylotominæ.

Cameron, Biol. Centr. Am. *Hym.* pp. 36–51, figures or specially notices *Hylotoma dorsalis*, Klug, *fascialis*, Nort., *semifusca*, Nort., fig. 11, *Dielocera biramosa*, Klug, figs. 10 & 10*a–c*, *filiformis*, Nort. (♂ = *Hemidianeura scapularis*, Kirby), *Ptilia versicolor*, Klug (= *basipunctata*, Kirby), figs. 9 & 9*a–f*, pl. i., *Sericocera alternata*, Nort., pl. iii. figs. 4, 4*a–d*, 5, & 5*a*, *villosa*, Nort. (♂ = *plumicornis*, Nort.), pl. ii. fig. 15, *Pachylota varicolor*, Nort., and *sulcicornis*, Cam.

Hylotoma enodis, Linn. (= *atrata*, Klug), and *pagana*, Panz. Larva described; Von Stein, Ent. Nachr. ix. pp. 252–258.

New species :—

Hylotoma basimacula, p. 36, *bivittata*, pl. ii. figs. 14 & 14*a*, *b*, Panama, *testacea*, Costa Rica, p. 37, *intermedia*, Guatemala, p. 38, *nigriceps*, pl. iv. fig. 1, Nicaragua, p. 39, *annulipes*, pl. i. figs. 2 & 2*a*, Guatemala, Panama, *bipartita*, Panama, p. 40, *albitibialis* and *fasciatipennis*, Guatemala, p. 41, Cameron, Biol. Centr. Am. *Hym.*

Dielocera imitatrix, pl. i. fig. 4, Guatemala, and *crassa*, Mexico, *id. l. c.* pp. 42 & 43.

Ptilia nasuta, id. *l. c.* p. 44, pls. iii. figs. 1 & 1*a–c*, & iv. figs. 2 & 2*a*, Panama.

Sericocera quercus, pl. i. fig. 15, p. 46, *leucotarsis*, fig. 2, Guatemala, p. 47, *leucopoda*, fig. 3, pl. iii., *læta*, p. 48, *rufiventris*, *cærulea*, Panama, *truncata*, Guatemala, p. 49, and *crassitarsis*, Panama, p. 50, *id. l. c.*

Loboceratinæ.

Loboceras calcar, Nort., noticed and figured; Cameron, Biol. Centr. Am. *Hym.* p. 56, pl. i. fig. 12.

Loboceras varicorne, Panama, p. 54, *klugi*, pls. i. figs. 1 & 1*a*, & iv. figs. 3–3*a*, *b*, Guatemala, Panama, p. 55, *saussurii*, Mexico, *xanthostigma*, p. 56, *fuscipenne*, pl. i. fig. 6, Panama, *nigriceps*, Mexico, p. 57, spp. nn., Cameron, Biol. Centr. Am. *Hym.*

Perantherix westwoodi, Panama, and *bimaculata*, Guatemala, spp. nn., *id. l. c.* pp. 58 & 59, pl. iii. figs. 12, 12*a–f*, & 8 *a–e*.

Lophyrinæ.

Cameron, Biol. Centr. Am. *Hym.* pp. 61–66, figures or specially notices *Lophyroides tropicus*, Nort., pl. iii. figs. 10 & 10*a–d*, *anomalus*, Kirby (= *compta*, ♂, Kirby), *Perreyia capitula*, pl. iii. fig. 7, *compta*, N and *Decameria fumipennis*, Kirby.

Lophyrus similis, Hart. Ravages in the Riesengebirge; first part; second part; Poleck, JB. schles. Ges. lx. pp. 121 & 122.

Lophyroides ruficollis, pl. iii. figs. 11 & 11*a*, Panama, an (*Dolerus*; *as*, *Dineura*; Guatemala, spp. nn., Cameron, Biol. Centr. Am. *Hym.* p. 62. *a*, *Athal*

Perreyia championi, sp. n., *id. l. c.* p. 64, pl. iv. fig. 6, Guatemala.

Decameria rufiventris, Costa Rica, *nigriventris*, pl. iii. figs. 9 & 9*a*, Panama, p. 65, *caripes* and *facialis*, Guatemala, p. 66, spp. nn., *id. l. c.*

Nematinæ.

Brischke, C. G. A., & Zaddach, G. Beobachtungen über die Arten der Blatt- und Holzwespen, mitgetheilt von Brischke aus Zaddach's Manuscripten. Schr. Ges. Königsb. xxiii. pp. 127–200, pl. vii.

Includes *Nematus*, species 29–95, referred to groups 9–16, represented by *N. nigriceps*, *fahræi*, *croceus*, *conjugatus*, *salicis*, *mycsotidis*, *vagus*, and *crassus*. The plate represents the larvæ of various species. Much synonymy is given.

Nematus. *Cleptes semiauratus* bred from a cocoon; Fletcher, Ent. M. M. xx. p. 71. *N. erichsoni*, Hart.: habits, transformations, and ravages in North America described; Riley, Rep. Dep. Agric. 1883, pp. 138–146, pls. iii. fig. 1, & xiii. figs. 1, 1*a*, & 2–4, and Packard, Bull. Dep. Agric. Ent. iii. pp. 29 & 30. *N. integer*, Say: transformations described and details figured; Riley, *l. c.* pp. 149 & 150, pl. xiii. figs. 6 & 6*a–c*. *N. melanocephalus*, Hart., is parthenogenetic; parthenogenesis is confined to those green species of *Nematus* whose larvæ have green heads varied with dark stripes and blotches, and feed solitarily; the males of *N. curtispina* fight among themselves, but take no notice of parthenogenetic females: Cameron, Ent. M. M. xix. pp. 206 & 207. *N. ventricosus*, Hart.: eggs destroyed by *Trichogramma pretiosa*, Riley; Lintner, P. Am. Ass. xxxi. pp. 471 & 472, Pysche, iv. pp. 48–51, and Canad. Ent. xvi. p. 200: transformations described; Thomas, Rep. Ins. Illin. xi. pp. 46–48.

New species:—

Cladius parvus, Zaddach, Schr. Ges. Danz. (2) v. (4) p. 225, Germany.

Leptopus carinthicus, Z., Carinthia, p. 216, *auritæ*, Z., Königsberg, p. 217, *apicalis*, B., Sonderburg, and *ovatus*, Z., pl. i. fig. 19, Bautzen, p. 218, Brischke & Zaddach, *l. c.*

Nematus lariciphagus, Zoppot, p. 129, *pyrrhonotus*, Vienna, p. 130, *ruficeps*, Sonderburg, p. 131, *ardens*, Silesia, p. 133, *brunnicornis*, Prussia, p. 136, *fagi*, Danzig, p. 139, *montanus*, Switzerland, p. 142, *miltonotus*, Prussia, Mecklenburg, p. 143, *nigricornis*, Dammhof, p. 146, *tetricus*, Thuringia, p. 148, *velatus*, Bavaria, p. 149, *sauterianus*, E. Prussia, p. 153, *pœcilonotus*, Z., Danzig, pp. 154 & 178, *eurysternus*, Germany, Bohemia, Scotland, p. 162, *tunicatus*, Germany, p. 166, *xanthopus* (= *posticus*, Först.), Germany, [illegible] Scotland, p. 167, *togatus* [? André], Danzig, p. 170, *lævis*, Z., [illegible] *solitarius*, Copenhagen, p. 179, *sulphureus*, Germany, p. [illegible] [illegible]any, Finland, p. 186, *multiplex*, Silesia, *alnicola*, West Ge[illegible]188, *spirææ*, Munich, p. 189, *lanificus*, Königsberg (and Vienna?), p. 192, *lævigatus*, Germany, p. 194, *cirrhostomus*, Finland, *obscuratus*, Sweden, Hungary, p. 195, and *leucolenus*, Z., Danzig, p. 196, Brischke & Zaddach, Schr. Ges. Königsb. xxiii.; *N. polaris*, *reticulatus*, p. 143, *morionellus*, *occipitalis*, *obscuripes*, p. 144, *anceps*, *mysticus*, p. 145, *lucentericus*, *nigriventris*, *parvulus*, p. 146, *varipictus*, *picticollis*, *udus*, p. 147, *extremus* and *abnormis*, p. 148, Holmgren, Ent. Tidskr. iv., Waigatz and Novaya Zemlya; *N. bridgmani* and *lætus*, Cameron, Tr. E. Soc. 1883, pp. 193 & 194, England.

Römer & godman

Cryptocampus latus, Z., fig. 4, E. Germany, Austria, p. 204, *helveticus*, Z., Switzerland, p. 205, *venustus*, Z., p. 206, *gemmarum*, Z., fig. 11, Germany, p. 207, *testaceipes*, B., fig. 13, K., pl. viii., *pygmæus*, B., pl. i. fig. 3, p. 209, *brevicornis*, Z., p. 210, *fuscus*, Z., Germany, p. 211, *pictus*, Z., Königsberg, and *robustus*, Z., Bautzen, p. 212, Brischke & Zaddach, Schr. Ges. Danz. (2) v. (4).

Diphadnus lævigatus, Zaddach, Schr. Ges. Danz. (2) v. (4) p. 213, Halle.

Dineura melanoxantha, Z., Rostock, p. 232, *nigra*, Z., Lüneburg, p. 235, and *hepaticæ*, B., pl. ii. fig. 2, Heiligenbrunn, p. 237, Brischke & Zaddach, *l. c.*

Selandriinæ.

Blennocampa lanceolata, Thoms. Larva described; Von Stein, Ent. Nachr. ix. pp. 251 & 252.

Monophadnus fuscipennis and *ochra*, Nort., noticed and figured; Cameron, Biol. Centr. Am. *Hym.* pp. 23 & 26, pl. i. fig. 17, & pl. ii. fig. 7.

Hoplocampa brunnea, Klug (= *ferruginea*, Panz.), [illegible] *fulvicornis*, Fabr., noticed as injurious to plum trees; Lichtenstein, [illegible]d'Ent. ii. p. 118.

Pompholyx, Freymuth (preoccupied), renamed *Cacosomatya*; Kirby, Tr. E. Soc. 1883, p. 203.

Eriocampa luteola, Klug, ♂ described; Von Stein, Ent. Nachr. ix. pp. 150 & 151. *E. soror*, Voll.: transformations described, the larva is injurious to rose trees; André, Feuill. Nat. iii. pp. 134 & 135.

New species:—

Blennocampa rosarum, fig. 5, p. 281, *spirææ*, fig. 6, pl. v., and *brevicornis*, p. 282, Brischke, Schr. Ges. Danz. (2) v. (4), Germany; *B. albo-femoralis*, figs. 12 & 12*a*, *intermedia*, figs. 11 & 11*a–c*, p. 31, *leucosoma*, Panama, *subcærulea*, fig. 10, Guatemala, Panama, p. 32, and *alpina*, Mexico, p. 33, Cameron, Biol. Centr. Am. *Hym.* pl. ii.

Monophadnus trimaculatus, pl. ii. figs. 6 & 6*a–c*, Guatemala, *lætus*, Panama, p. 22, *costalis*, Mexico, *annulipes*, pl. i. figs. 3 & 3*a–c*, Guatemala, p. 23, *interstitialis*, Panama, p. 24, *testaceus*, *tibialis*, p. 25, *violaceipennis*, pl. ii. figs. 8 & 8*a*, *b*, Guatemala, p. 26, *fumosus*, Panama, p. 27, *suturalis*, Guatemala, p. 28, *obsoletus*, Panama, *imitatrix*, p. 29, *clypeatus*, Guatemala, and *melanosternus*, Panama, p. 30, *id. l. c.*

Selandria luteola, Panama, p. 18, *leucopoda*, *crassa*, pl. ii. figs. 5 & 5*a–c*, p. 19, *mutica*, Guatemala, *nigripes*, Panama, p. 20, and *varitarsis*, Mexico, Guatemala, p. 21, *id. l. c.*

Phyllotominæ.

Fenusa gei and *minima*, spp. nn., Brischke, Schr. Ges. Danz. (2) v. (4) p. 264, pl. iii. figs. 10 & 11, Germany.

Phanusa doderleini, sp. n., Destefani, Nat. Sicil. iii. p. 12, Sicily.

Emphytinæ.

Strongylogaster. Cameron, Biol. Centr. Am. *Hym.* pp. 14–17, specially notices or figures *S. fulviventris*, fig. 13, *meritorius*, *nigritorius*, Nort., fig. 14, *diversipes*, Kirb., fig. 5, pl. i., *nigricans* and *nigredo*, Nort.

Pœcilosoma fletcheri, Cam., noticed; Billups, P. E. Soc. 1883, p. xxxvi.

New species:—

Emphytus championi, pl. ii. fig. 13, Guatemala, and *mexicanus*, Mexico, Cameron, Biol. Centr. Am. *Hym.* p. 35.

Aneugmenus thwaitesi, Kirby, Tr. E. Soc. 1883, p. 203, Ceylon.

Pœcilosoma mexicanum, Cameron, *l. c.* p. 34, pl. ii. figs. 9 & 9*a–e*, Mexico.

Strongylogaster picticornis, Guatemala, p. 4, *v-flavum*, Guatemala, Panama, p. 5, *lætus*, figs. 3 & 3*a*, Panama, p. 6, *testaceicornis*, Costa Rica, p. 7, *pilicornis*, figs. 1 & 1*a–c*, pl. ii., *pilipennis*, p. 8, *maculipennis*, pl. i. fig. 8, p. 9, *melanosoma*, Panama, *melanocephalus*, pl. ii. fig. 2, p. 10, *nigriceps*, Guatemala, *frontalis*, p. 11, *luteus*, Panama, *leucosoma*, pl. i. fig. 7, Guatemala, p. 12, *tibialis*, Panama, *nigricornis*, Guatemala, p. 13, *fuscipennis*, Mexico, *ruficollis*, Guatemala, p. 15, and *bicolor*, pl. ii. figs. 4 & 4*a*, Guatemala, p. 17, *id. l. c.*

Tenthredininæ.

Sciopteryx costalis, Fabr. Larva described; Von Stein, Ent. Nachr. ix. pp. 247–251. (This larva has been erroneously described as that of *Selandria serva*, Fabr., by Brischke and Zaddach.)

Allantus armatus, Först. Larva described; *id. l. c.* pp. 209–213.

Tenthredo testudinea, Klug. Habits, &c., of larva; Douglas, Ent. M. M. xx. pp. 70 & 71.

Tenthred[in]opsis inornata and *Tenthredo lachlaniana*, Cam., noticed; Billups, P. E. Soc. 1883, p. xxxvi.

Allantus atratus, André, Ann. Soc. Ent. Fr. (6) iii. p. 206, Sarepta; *A. mœstus*, Caucasus, and *dorsatus*, East Indies, Mocsáry, Ért. Term. Kör. xiii. pp. 3 & 4: spp. nn.

Siobla ornaticornis, sp. n., Cameron, Biol. Centr. Am. *Hym.* p. 3, pl. i. figs. 16 & 16*a*, *b*, Guatemala.

Pachyprotasis viridis, sp. n., Brischke, Schr. Ges. Danz. (2) v. (4) p. 297, pl. vii. fig. 1, Germany.

Tenthredo semseyi, Hungary, p. 4, *andreæi*, Dobrudscha, p. 6, *caspica*, Caucasus, and *concinna*, East Indies, p. 7, spp. nn., Mocsáry, *l. c.*

Lydinæ.

Megalodontes (*Tarpa*) *anatolicus*, sp. n., Mocsáry, Ért. Term. Kör. xiii. p. 8, Asia Minor.

Cephinæ.

Cephus femoratus, Curt., noticed from Sweden; Möller, Ent. Tidskr. iv. pp. 91 & 92.

Macrocephus robustus, sp. n., Mocsáry, Ért. Term. Kör. xiii. p. 9, Caucasus.

LEPIDOPTERA.

BY

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

THE GENERAL SUBJECT.

DRUCE, H. Biologia Centrali-Americana [*cf.* GODMAN & SALVIN, *Insecta*, General Subject]. *Lepidoptera Heterocera*, pp. 25–32, pls. iii.–v.

Extends from *Castnia* to *Tirista*.

FLEISCHER, J. M. Taschenbuch für Raupen- und Schmetterlingssammler. Leipzig: 1883, 8vo, pp. 242.

GERHARD, E. Ueber die geographische Verbreitung der Macro-Lepidopteren auf der Erde. B. E. Z. xxvii. pp. 173–185.

The author enumerates the genera of Butterflies peculiar to the various parts of the world; the *Sphinges* and the remaining *Macrolepidoptera* are discussed much more briefly.

GOSSE, P. H. On the Clasping-Organs auxiliary to Generation in certain Groups of the *Lepidoptera*. Tr. L. Soc. (2) Zool. ii. pp. 265–345, pls. xxvi.–xxxiii.

An abstract of this paper was published in P. R. Soc. xxxiii. [*cf.* Zool. Rec. xix. *Ins.* p. 163]. The author fully describes and illustrates with highly-magnified drawings the various parts as observed by him in 69 species of *Ornithoptera* and *Papilio*, among which 12 well-marked forms of structure occur. The introductory remarks relate to bibliography and manipulation. The concluding observations relate to *Ornithoptera remus*, Cram., a few species of *Papilio* not previously noticed, and comparative remarks on the structure of *Pieris*, *Callidryas*, *Gonepteryx*, *Terias*, *Colias*, *Morpho*, and *Dynastor*.

GROTE, A. R. A Brief Essay on Classification of the *Heteroc* pilio, iii. pp. 35–38.

Relates chiefly to the general value of characters.

KIRBACH, P. Über die Mundwerkzeuge der Schmetterlinge. Vorläufige Mittheilungen. Zool. Anz. vi. pp. 553–558, figs.

Relates to the maxillæ (proboscis), &c.

KOLBE, H. J. Beitrag zur Systematik der *Lepidoptera*. B. E. Z. xxvii. pp. 217–224.

The writer draws attention to the correlation existing between the discoidal neuration and nervous system of *Lepidoptera*.

MÜLLER, F. Eine Aufgabe für Lepidopterologen. B. E. Z. xxvii. pp. 214–216.

The writer regards the resemblance of the larvæ of various genera of Butterflies and their feeding on allied plants as affording very strong indications of relationship.

OBERTHÜR, C. Études d'Entomologie. 7 e livraison, May, 1883: Lépidoptères d'Europe et d'Amérique méridionale, pp. 36, pls. iii.

RÖSSLER, A. Welches ist das beste System der Lepidopteren? S. E. Z. xliv. pp. 244–248.

A general discussion on the subject.

SPEYER, A. Bemerkungen über den Einfluss des Nahrungswechsels auf morphologische Veränderungen, insbesondere bei den Arten der Gattung *Eupithecia*. S. E. Z. xliv. pp. 333–356.

An important physiological paper. The species more especially discussed are *Eupithecia absinthiata*, Clerck, *Eugonia quercinaria*, Hufn., *Eup. succenturiata*, Linn., and *subfulvata*, Haw., *E. strobilata*, Borkh., *Iodis lactearia* and *putatoria*, Linn., *Plusia iota*, Linn., and *pulchrina*, Haw.

STAINTON, H. T. In what State or Condition do our Butterflies pass the Winter? Rep. W. Kent Soc. 1880–81, pp. 22–24.

WEIR, J. J. Variations in the Colour of *Lepidoptera*. Ent. xvi. pp. 169–176, and Rep. W. Kent. Soc. 1882–83, pp. 40–48.

The writer proposes to class colour-variations as follows:—

"*Aberrations, or Heteromorphism.*—White: Albinism. Pallid: Xanthism. Black: Melanism. Sports: Heteropœcilism. Females coloured as males: Gynandrochromism. Both sexes in one individual: Hermaphroditism.

"*Constant Variations, or Orthopœcilism.*—Variable species: Polymorphism. Local variations: Topomorphism. Reversion: Atavism. Two static conditions: Dimorphism. Three static conditions: Trimorphism. Seasonal variation: Horeomorphism."

General observations on *Lepidoptera*, which the writer considers to be most nearly related to the *Hymenoptera*; Hempel, Ber. Ges. Chemn. vii. [1881] pp. 76–79.

On mimicry in Butterflies, &c.: Wallace & Meldola, Nature, xxvii. pp. 481 & 482; Distant, Ann. N. H. (5) xi. pp. 43–48; Lippert, Humboldt, i. pp. 402–408, woodcuts.

Abstract of Barrett's paper on the influence of meteorological conditions on insect life [Ent. M. M. xix. pp. 1–6; *cf.* Zool. Rec. xviii. *Ins.* p. 152]; Psyche, iv. pp. 83–89.

Note on the classification of Moths; Grote, Am. Nat. xvii. pp. 496–498.

Remarks on the resemblance between various *Lepidoptera* of different families; Gerhard, Bull. Ent. Ital. xv. pp. 158–162.

Resemblance between East Indian Butterflies, and those of the Atlantic Islands; W. F. Kirby, Evolution and Natural Theology, pp. 117 & 118.

Butterflies with malformed wings; Harding, Ent. xvi. pp. 257 & 258.

Gratacap has been unable to ascertain that Moths show a preference for any particular coloured light; Am. Nat. xvii. pp. 791 & 792.

The mealy odoriferous spot found at the base of the costa in the males of some Butterflies does not occur in all individuals of the same species; Hagen, Nature, xxviii. p. 244.

Lepidoptera drinking water and other liquids; Layard, Nature, xxviii. p. 589.

On the appearance of various injurious *Lepidoptera*; Wernicke, Ent. Nachr. ix. p. 200.

List of *Lepidoptera* injurious to different species of *Quercus*; Mina-Palumbo, Nat. Sicil. ii. pp. 298–302, iii. pp. 31, 32, 54–56, & 92–96. Extends to *Pygæra*.

Moths injurious to corks; Fallou & Constant, Bull. Soc. Ent. Fr. (6) iii. pp. xxix., xxx., xxxvi, xliv., & xlv.

Fertilization of *Lilium* by Butterflies; Focke, Kosmos, xiii. pp. 653–659.

Setting-board described and figured; Bryan, Sci. Goss. xix. p. 277, fig. 180.

Bait for *Lepidoptera* discussed, with list of captures; H. L., Ent. Nachr. ix. pp. 9–14.

Moth-trap; Bull. Brooklyn Soc. vi. p. 60.

On collecting Moths at flowers during the day; J. B. Smith, Bull. Brooklyn Soc. v. p. 82.

On preserving *Lepidoptera* and larvæ; Sci. Goss. xix. pp. 21 & 22.

Discussion on the origin of the colours of larvæ; P. E. Soc. 1883, pp. xxxiii. & xxxiv.

On rearing Lepidopterous larvæ in confinement; Wilson, Ent. xvi. pp. 47 & 48.

Feeding larvæ on dried leaves soaked in water; Mundt, Papilio, iii. pp. 25 & 26.

Heliothis armigera, *Checias spartiata*, and *Lithosia quadra*. Larvæ preferring yellow flowers; [Mrs.] M. S. Jenkyns, Ent. xvi. p. 23.

On preserving Lepidopterous larvæ by inflation; Finch, Sci. Goss. xix. pp. 35 & 36.

Experiments on destroying Lepidopterous larvæ with *Pyrethrum*; Riley, Bull. Dep. Agric. Ent. iii. pp. 16–23.

List of Hymenopterous parasites on *Lepidoptera*; Fitch & Bridgman, Ent. xvi. pp. 64–69.

Clarkson describes the cocoons of parasites on the following species:—*Telea polyphemus*, *Papilio troilus*, *Platysamia cecropia*, *Philampelus achemon*, and *Spilosoma virginicum*; Canad. Ent. xv. pp. 162 & 163.

On variation in size in eggs of *Lepidoptera* laid by the same ♀; Hellins, Ent. M. M. xix. pp. 208 & 209.

On the date of Hübner's works; Grote, Papilio, iii. pp. 109 & 110.

Note on the collections of *Lepidoptera* in Cambridge Museum; Hagen, Papilio, iii. p. 65.

FAUNÆ.

Europe.

MILLIÈRE, P. Lépidoptérologie. 8me fascicule. Ann. Soc. L. Lyon, xxix. pp. 153–179.

ROUAST, G. Catalogue des Chenilles Européennes connues. Ann. Soc. L. Lyon, xxix. pp. 251–363.

Includes *Macrolepidoptera*. The food-plants are indicated.

Parts xii.–xv. of Lang's "Butterflies of Europe" (pp. 177–240, pls. xlvi.–lviii.) have appeared within the year.

Short notes on various European *Lepidoptera*; Martini, Ent. Nachr. xiv. pp. 14–16, 53, & 54.

British *versus* European *Lepidoptera*; Marston, Ent. xvi. pp. 108–112.

Note on *Lepidoptera* observed on glaciers; Rey, Soc. Sc. Nat. du Sud-Est, 1883 (*cf.* Rev. d'Ent. ii. pp. 47 & 48).

British Islands.

KANE, W. F. DE V. Report on the Entomology of Certain Districts in Ulster. P. R. Irish Ac. (2) iii. pp. 784–792.

General observations; a list of *Lepidoptera* taken in 1882 in Co. Cavan and Co. Tyrone is appended, including 3 species new to Ireland.

MOSLEY, S. L. An Attempt to Classify the British *Lepidoptera*, so as to form a connection with the *Trichoptera* at one end and the *Hymenoptera* at the other. Naturalist, viii. pp. 87–89.

The heads of the proposed re-arrangement are—*Acentropus*, *Hydrocampa*, *Pyrales*, *Deltoides*, *Crambites*, *Tortricina*, *Tinecina*, *Geometrina*, *Noctuæ*, *Bombyces*, *Rhopalocera*, *Sphinges*.

PORRITT, G. T. List of Yorkshire *Lepidoptera*. Ent. Tr. Yorksh. Un. ii. pp. 190 (Tr. Yorksh. Union Series, D. *Articulata*, ii.).

The list includes 1343 out of 2031 British species. The nomenclature of Doubleday's list is followed.

SWINTON, A. H. A Physiological Arrangement of the British *Lepidoptera*. Naturalist, viii. pp. 98–100.

The writer proposes to arrange the *Macrolepidoptera* as follows:—*Noctuæ*, *Pseudo-Bombyces*, *Drepanulæ*, *Deltoides*, *Geometræ*, *Bombyces*, *Diurni*, *Sphingina*.

S. L. Mosley has published parts xii. & xiii. of his "Illustrations of Varieties of British *Lepidoptera*," representing varieties of *Gonepteryx rhamni*, *Colias hyale* and *edusa*, *Melitæa artemis*, *cinxia*, *athalia*, *Vanessa c-album*, *urticæ*, *atalanta*, *cardui*, *Limenitis sibylla*, *Apatura iris*, and *Arge galathea*.

De V. Kane attributes the scarcity of *Lepidoptera* in 1883 to the mild winter, rendering their enemies more numerous and destructive to pupæ, to the storms dislodging tree-feeding larvæ, and to the unusual atmospheric conditions deranging the usual time of appearance of species; Ent. xvi. pp. 52–55.

Periodical occurrence of various *Lepidoptera* in England discussed; Swinton, Rep. U. S. Ent. Comm. iii. pp. 78–83.

A series of papers on British Moths, by J. E. Robson, is running through Young Nat. iv.

Notes on collecting *Lepidoptera* in England in the early half of the century; Harding, Ent. xvi. pp. 127–132.

Notes on the late Capt. Chawner's collection of British *Lepidoptera*; Swinton, Sci. Goss. xix. pp. 237 & 238.

List of *Lepidoptera* of Washburndale, chiefly from observations by Lord Walsingham & T. Eadle; Naturalist, ix. pp. 17–19.

Stray notes on the *Lepidoptera* of Pembrokeshire; Barrett, Ent. M. M. xx. pp. 28–31.

List of *Macrolepidoptera* occurring about Maldon, Essex; Raynor, Tr. Essex Club, iii. pp. 30–47.

List of Butterflies of Huntingdonshire; Norris, Ent. M. M. xx. p. 164.

Notes on the *Lepidoptera* of the Shetland Islands; Dent, P. Manch. Soc. xxi. pp. 126–129.

Captures of British *Lepidoptera* in various localities (too numerous to be recorded in detail) are announced in Ent. xvi.; Ent. M. M. xix. & xx.; Naturalist, vii. pp. 108 & 109, viii. pp. 90, 94, & 108, ix. pp. 71, 81, 82, & 89; Sci. Goss. xix. pp. 220–222 & 282; Rep. Marlborough Soc. xxxi. pp. 85–89; Rep. Rugby Soc. 1882, pp. 32 & 33.

Scandinavia and Russia.

Grumm-Grshimailo, G., & Swiatsky, J. Ueber einige *Lepidoptera* von Narva. Hor. Ent. Ross. xvii. pp. 148–155.

An unimportant contribution to geographical distribution.

Sandberg, G. Iagttagelser over Arktiske Sommerfugles metamorphoser. Ent. Tidskr. iv. pp. 9–28 & 52–55.

Relates to *Œneis bore*, Schneid., *Erebia lappona*, Esp., *Argynnis freja* (?), Thunb., *Arctia quenseli*, Payk., *Trichiura crataegi*, *Eriogaster* sp., *Saturnia pavonia*, *Notodonta dromedarius*, *Cymatophora duplaris*, Linn., *Acronycta auricoma*, W. V., *Pachnobia carnea*, Thunb., *Agrotis hyperborea*, Zett., *speciosa*, Hübn., *Anarta melaleuca*, Thunb., *lapponica* (?), Thunb., *Selenia bilunaria*, Esp., *Cidaria dilutata*, W. V., *Eupithecia hyperboreata*, Staud., *Crambus furcatellus*, Zett., and *Plutella cruciferarum*, Zell. The notices vary from a full description of the earlier stages to a mere notice of the pupa.

Schneider, J. Sparre. Fortsatte Bidrag til Kundskaben om Sydvarangers Lepidopterfauna. Ent. Tidskr. iv. pp. 63–88 & 127–129, map.

81 species are noticed in detail, 19 being new to the district; the total number now known from it being 151.

——. Oversigt over de i Nedenæs amt bemærkende *Lepidoptera*. Forh. Selsk. Chr. 1882 (2) pp. 1–129.

Includes detailed observations on 398 known species, and a table of distribution of 100 butterflies and 31 *Sphinges* occurring at St. Petersburg, Stockholm, Christiania, Næs Værk, and Bergen.

Schøyen, W. M. Nye Bidrag til Kundskaben om det arktiske Norges Lepidopterfauna. Tromsö Mus. Aarsh. v. [1882] pp. 1–61.

Contains a list, with critical observations, of 237 *Lepidoptera* from Saltdalen; and additional observations on the *Lepidoptera* of Arctic Norway in general. Out of 1102 Norwegian species, 373 are Arctic, and 295 inhabit the Dovrefjeld.

Short notes on Livonian *Lepidoptera*; Teich, S. E. Z. xliv. pp. 171–175.

Captures of *Lepidoptera* near St. Petersburg in 1882; Deske, Hor. Ent. Ross. xvii. pp. 228–234.

France.

Jourdheuille, C. Catalogue des Lépidoptères du département de l'Aube. Troyes: 1883, 8vo, pp. 229 (Extracted from Mém. Soc. Aube, xlvii.).

1378 species enumerated, with notes on localities, food-plants, habits, &c.

Captures of *Lepidoptera* in the Pyrenees in September; Jones, Ent. M. M. xix. pp. 207 & 208.

Captures of *Lepidoptera* in various parts of France; Brown, Act. Soc. L. Bord. xxxvi. pp. xviii., xix., xxxvii., xxxviii., & lxxi–lxxiv.

List of *Lepidoptera Rhopalocera* of the Rhone Valley; Tasker, Bull. Soc. Murith., ix. pp. 39–42, & xi. pp. 15–17.

List of *Lepidoptera* of Morlaix; Lauzanne, Feuill. Nat. iii. p. 91.

Mimicry in a Moth (?) observed by the Duke of Argyle at Cannes; P. E. Soc. 1883, p. ii.

Holland, Belgium, Germany, Austria, Switzerland.

Christ, H. Ueber den Charakter der Tarasper Tagfalter- und Zygænen-Fauna. JB. Ges. Graub. xxvi. pp. 8–18.

A curious mixture of southern and alpine forms is observable.

Fuchs, A. Macrolepidopteren des unteren Rheingaues. S. E. Z. xliv. pp. 248–278.

Supplementary to former papers, and of some importance with respect to the range of species. The species mentioned will be noticed in their places.

Höfner, G. Die Tagfalter Deutschlands, der Schweiz und Österreich-Ungarns. Analytisch bearbeitet. Wolfsberg: 1879, 8vo, pp. vi. & 147.

[Not seen by Recorder.]

Peyerimhoff, H. de. Catalogue des Lépidoptères d'Alsace, avec indication des localités, de l'époque d'apparition et de quelques details propres à en faciliter la recherche. 2e edition. i. Macrolépidoptères, revué et coordonnée par Macker (Colmar: 1880, 8vo, pp. 168); ii. Microlépidoptères, revué et coordonnée par Fettig (Colmar: 1882, 8vo, pp. 182). [For pt. ii., *cf.* also Bull. Soc. Colmar, xxii. & xxiii. pp. 35–214.]

Snellen's "Vlinders van Nederland" (*Microlepidoptera*) discussed; Westmaas, Tijdschr. Ent. xxvi. pp. 79–86.

Additions and corrections to the list of Belgian *Lepidoptera*; in 1873, 1475 Belgian species were known; in 1883, 1702 are enumerated, which approaches the number recorded from Nassau (1895): Donckier & De Borre, C.R. ent. Belg. xxvii. pp. lxxxii. & lxxxiii.

On German names of Butterflies, *Sphinges*, and *Bombyces*, with etymological notes; Glaser, Ent. Nachr. ix. pp. 17–24, 29–40, 73–84, & 123–128. Remarks by Knüpffer & Katter, *tom. cit.* pp. 40–44.

Eighth supplementary list of *Macrolepidoptera* of Breda, with notes; Heylaerts, Tijdschr. Ent. xxvi. pp. cxlix.–cliv.

List of *Lepidoptera* taken at the electric lamps in Strasburg; Reiber, Bull. Soc. Colmar, xxii. & xxiii. pp. 251 & 252.

Third supplement to the list of *Lepidoptera* of Hanover; Glitz, JB. Ges. Hannover, 31 & 32, pp. 30–32.

Obituary notice of F. Schmidt, and notes on his observations on the *Lepidoptera* of Mecklenburg; Struck, Arch. Ver. Mecklenb. xxxvi. pp. 194–202.

List of *Lepidoptera* (to *Cymatophoridæ*) in the collection of the Gymnasium at Arnsberg; Heuze, JB. k. Laurent. Arnsberg, 1882–83, pp. i.–xxxiv.

Catalogue of the *Macrolepidoptera* of the neighbourhood of Cassel, with short notes on varieties, &c. (690 species out of 1378 found in Germany, Austria, and Switzerland); Knatz, Ber. Ver. Cassel, 29 & 30, pp. 71–89.

Catalogue of *Macrolepidoptera* of Hanau; Limpert & Rüttelberg, Ber. Ges. Hanau, 1873–79, Beilage, iii. pp. 48.

Captures of *Lepidoptera* in Thuringia; Martini, Ent. Nachr. ix. p. 54.

Captures of *Lepidoptera* in the district of Berchtesgaden in Bavaria; Schirm, JB. nass. Ver. xxxvi. pp. 89–102.

List of *Macrolepidoptera* of the neighbourhood of Kempten, in Bavaria; Kolb, Ber. Ver. Augsb. xxvii. pp. 113–144 (625 species).

Captures of *Lepidoptera* on the Spitzentobel (near St. Gallen-Weissenbach); Gross, Ent. Nachr. ix. pp. 147–150.

Abundance of *Lepidoptera* in the Visp Valley; Melville, Ent. xvi. pp. 15 & 16.

List of *Lepidoptera Rhopalocera* and *Sphinges* (exclusive of *Sesiidæ*), of the Valais; Christ, Bull. Soc. Murith. ix. pp. 57–77.

Captures of *Lepidoptera* in the Simplon; Joris, Bull. Soc. Murith. ix. p. 38.

Captures of *Lepidoptera* at St. Egyd, in Lower Austria; Habich & Rebel, Wien. ent. Z. ii. pp. 31–34.

Notes on the *Macrolepidoptera* of Carinthia; Höfner, Wien. ent. Z. ii. pp. 189–194, 221–224, 245–250, & 277–280.

Captures of *Lepidoptera* in the mountains of Siebenbürgen; [illegible] the total, JB. sieb. Karp. Ver. i. p. 116.

Italy and Spain.

Curò, A., & Turati, G. Saggio di un Catalogo dei Lepidotteri [illegible]a. Forh[illegible]a. Parte vie. Microlepidotteri. Bull. Ent. Ital. xv. pp. 1–144. [illegible]

Includes *Tineina*, *Micropterygina*, *Pterophorma*, and *Alucitina*, and additions to the *Pyralidina* and *Tortricina*.

Captures of *Lepidoptera* at Acqui ; Millière, Nat. Sicil. iii. p. 37.

Captures of Butterflies, *Sphinges*, and *Bombyces* found in the province of Teruel, in Spain ; Zapater & Korb, An. Soc. Esp. xi. pp. 273–318.

List of Butterflies observed at Gibraltar ; Becher & Parry, Ent. xvi. pp. 241–243 & 279–281.

Africa.

Oberthür, C. Spedizione Italiana nell' Africa equatoriale. Resultati Zoologici. Lepidotteri, Parte secunda. Ann. Mus. Genov. xviii. pp. 709–740, pl. ix., and Mem. Soc. Geogr. Ital. ii. 3, pp. 21–52, pl. ix.

111 species mentioned, several new. Long lists of localities are given for many.

Captures of *Lepidoptera* by H. Codet at Sebdou, Algeria ; C. Oberthür, Bull. Soc. Ent. Fr. (6) iii. pp. xlvii. and xlviii.

List of a few *Lepidoptera* collected by C. Nodier in Senegal ; *id. l. c.* pp. xi.–xiii.

Caterpillar eaten by the Bantus in E. Africa ; Buchner, Ausland, Jan. 8, 1883, pp. 23 *et seq.* (cf. Am. Nat. xvii. pp. 546 & 547).

On some *Lepidoptera* from the Victoria Nyanza ; Butler, Ann. N. H. (5) xii. pp. 101–107.

On collecting Butterflies at Natal ; Spiller, Ent. xvi. pp. 118 & 119.

Asia and Australasia.

Butler, A. G. The *Lepidoptera* collected during the recent Expedition of H.M.S. 'Challenger.' Ann. N. H. (5) xi. pp. 402–428.

101 species from the Philippine, Aru, Admiralty, Fiji, and Friendly Islands noticed.

——. On a Collection of Indian *Lepidoptera* received from C. Swinhoe, with numerous notes by the Collector. P. Z. S. 1883, pp. 144–175, pl. xxiv.

150 species mentioned, many new.

Moore, F. The *Lepidoptera* of Ceylon. Parts vii. & viii. (vol. ii. pp. viii. & 73–162, pls. cviii.–cxliii.).

Extends from *Arctiidæ* to *Hepialidæ*. The transformations of most of the species noticed are described and figured.

Meyrick, E. Descriptions of New Zealand *Microlepidoptera*. Tr. N. Z. Inst. xv. pp. 3–68.

Relates to *Crambidæ* and *Tortricidæ*. An abstract of this paper was pub[illegible] in N. Z. J. Sci. i., and the new genera and species are noticed in[illegible] indi[illegible]ec. xix., and need not be recapitulated. The introductory detai[illegible]ate to neuration, and to the general characteristics of the New lépido[illegible]na. pp. 1[illegible]

(Colm[illegible] & De Nicéville have published vol. i. pt. 2 of their "Butter-fli[illegible] xxii ndia, Burmah, and Ceylon" (pp. 95–327, pls. x.–xvii. and woodcuts), including *Nymphalidæ*, subfamilies *Satyrinæ*, *Elymniinæ*, *Morphinæ*, and *Acræinæ* ; and indices to vol. i. The usefulness of the index

would have been increased if the principal reference had been discriminated from the subordinate references, where several occur under one name.

Parts iv.–vi. of Distant's "Rhopalocera Malayana" have appeared within the year (pp. 85–192, pls. xiii.–xxiv.). The letterpress extends from *Doleschallia* to *Abisara*.

Captures of *Lepidoptera* near Askabad; Christoph, Bull. Mosc. lvii. (2) pp. 217–226.

Mimicry in the larva of a Japanese Butterfly; Duncan Stewart, Nature, xxvii. p. 314.

Notes on 41 *Lepidoptera* from Manchuria and the Corea; Butler, Ann. N. H. (5) xi. pp. 104–117, 278, & 279.

10 Butterflies from Formosa noticed; *id. op. cit.* xii. pp. 50–52.

Scarcity of *Lepidoptera* in Queensland after April, 1882; Barnard, Ent. xvi. pp. 238 & 239.

Controversy respecting synonymy of various Australian *Micolepidoptera*; Butler & Meyrick, Ent. M. M. xx. pp. 14, 15, 122, & 123.

Australian woodboring larvæ of Moths supposed to be infested with *Filaria*; Ralph, J. Quek. Club (2) i. pp. 138 & 139.

7 Moths (5 new) noticed from the Hawaiian Islands; Butler, Ent. M. M. xix. pp. 176–180.

America.

Berg, C. Miscellanea Lepidopterologica. Contribuciones al estudio de la Fauna Argentina y países limítrofes. An. Soc. Arg. xv. pp. 151–169.

20 species noticed, several new.

Butler, A. G. Heterocerous *Lepidoptera* collected in Chili by T. Edmonds. Part iv. Pyrales and Micros. Tr. E. Soc. 1882, pp. 49–90, pl. xi.

Includes remarks on various genera and species described by Blanchard, Berg, Zeller, & Walker.

Champion, G. C. Further Tropical Notes. Ent. M. M. xix. pp. 226–229.

Observations on the habits of Butterflies in Central America.

Edwards, W. H. Notes on the Collection of Butterflies made by H. K. Morrison in Arizona, 1882. Papilio, iii. pp. 1–10.

About 100 species taken, one-third being *Hesperiidæ*.

Godman, F. Ducane, & Salvin, O. Biologia Centrali-Americana [*cf. Insecta*, General Subject]. *Rhopalocera*, pp. 225–288, pls. xxiv. xxiv. ii.; xxv.–xxvii.

Extends from *Eunica* to *Timetes*.

Grote, A. R. New Species and Notes on Structure of Moths and Genera. Canad. Ent. xv. pp. 3–13, 23–31, 86, 87, & 121–133.

——. On the Moths collected by Prof. Snow in New Mexico. Tr. Kansas Ac. viii. pp. 45–57.

[Grote, A. R.] The Moths of New Mexico. Ann. N. H. (5) xi. pp. 49–58.

The affinities of the fauna are discussed. There is a mixture of Eastern and Western American, tropical, and even European forms. A list of species is given, and several new ones are described.

Jones, E. D. Metamorphoses of *Lepidoptera* from San Paulo, Brazil, in the Free Public Museum, Liverpool, by E. Dukinfield Jones, with Nomenclature and Descriptions of New Forms by F. Moore, and an Introductory Note by T. J. Moore. P. Liverp. Soc. xxxvi. pp. 23–73, pls. iii.–vi. (Preliminary notice, xxxiii. pp. lxxiii.–lxxvii.)

Transformations of 48 species of *Lepidoptera* described.

——. Metamorphoses of Brazilian *Lepidoptera* from San Paulo, Brazil. The Nomenclature and Descriptions of New Forms by F. Moore. P. Liverp. Soc. xxxvii. pp. 227–259, pl. vii.

Includes notes (more or less complete) on the transformations of 28 additional species.

Möschler, H. B. Beiträge zur Schmetterlings-Fauna von Labrador. S. E. Z. xliv. pp. 114–124.

Supplementary to former papers. Many species are added, several being new.

——. Beiträge zur Schmetterlings-Fauna von Surinam. v. (Supplement.) Verh. z.-b. Wien, xxxii. pp. 303–362, pls. xvii. & xviii.

Part xi. of the Second Series of Edwards's "Butterflies of North America" has appeared within the year.

Critical notice of the Brooklyn Check List of *Macrolepidoptera* of N. America; Möschler, S. E. Z. xliv. pp. 154–156.

Synopsis of genera of N. American *Rhopalocera*; J. B. Smith, Bull. Brooklyn Soc. vi. pp. 37–45.

American flowers attractive to *Lepidoptera*; [Mrs.] C. H. Fernald, Papilio, iii. pp. 80 & 81.

The transformations of a large number of N. American *Lepidoptera* (far too many for detailed notice) are described and figured by Thomas, Coquillet, Marten, and (Miss) Middleton, Rep. Ins. Illin. x. pp. 72–186, figs. 6–79.

On *Lepidoptera* injurious to cabbages in N. America, with hints for their destruction; Riley, Rep. Dep. Agric. 1883, pp. 107–138.

On rearing various species of N. American Butterflies; W. H. Edwards, Canad. Ent. xv. pp. 169 & 170.

Notes on a collection of drawings of Newfoundland Butterflies (13 species) formed by P. H. Gosse; *id. l. c.* pp. 43 & 44. Gosse adds notes on transformations, &c., pp. 44–51.

Capture of Butterflies in Massachusetts in 1883; Sprague, Psyche, iv. pp. 99 & 100.

Captures of *Lepidoptera* in the Adirondacks in July, 1882; Hill, Papilio, iii. pp. 27–29.

Captures of *Lepidoptera* in New Jersey; H. Edwards, Papilio, iii. p. 25.

On collecting *Lepidoptera* in Long Island; J. B. Smith, Bull. Brooklyn Soc. v. pp. 89 & 90.

Butterfly hunting in the desert [Western America]; Wright, Am. Nat. xvii. pp, 363–369.

Localities of Butterflies from Washington Territory; Morrison, Papilio, iii. p. 43.

Captures of Butterflies in Lower California in winter (23 species); Wright, Papilio, iii. pp. 117–119.

Lists of *Lepidoptera* of Kansas: Snow, Tr. Kansas Ac. iv. [1875] pp. 29–59; vi. [1878] pp. 61 & 62; vii. [1881] pp. 102–105.

Lists of *Lepidoptera* collected in various parts of Colorado and New Mexico: *id. op. cit.* vi. [1878] pp. 70–75; vii. [1881] pp. 61–68 (with descriptions of new species by Grote); viii. [1883] pp. 35–39.

The fauna of South Florida is closely related to the West Indian; a list of parallel species of *Lepidoptera* found in Florida and Cuba is given: Grote, Papilio, iii. pp. 79 & 80.

On decoying and catching Butterflies in British Guiana; E. F. im Thurn, Timehri, i. p. 223, and Ent. M. M. xx. pp. 15 & 16.

On pendant nests of a gregarious Moth from Venezuela, supposed to belong to some species of *Bombycidæ*; Plant, P. Manch. Soc. xx. pp. 111–116 [1881].

It is doubtful whether Brazilian birds devour Butterflies to any great extent; Jones, P. Liverp. Soc. xxxvii. p. lxxviii.

Critical notice of Berg's "Farrago Lepidopterologica;" Grote, Papilio, iii. pp. 106–108.

Papilionidæ.

Papilio machaon: Hagen maintains that *P. sphyrus*, Hübn., *hospiton*, Gené, *asiatica*, Ménétr., *hippocrates*, Feld., *aliaska*, Scudd., *zolicaon*, Boisd., and *oregonia*, Edw., are only local forms; P. Bost. Soc. xxii. pp. 105–109. In opposition to Hagen, W. H. Edwards discusses the allied forms, and maintains that *P. oregonia* is a distinct species of the same group as *machaon*, while *zolicaon*, Boisd., actually belongs to a different group; the anal ocelli of *P. asterias*, *zolicaon*, *oregonia*, and *machaon*, are figured for comparison: Papilio, iii. pp. 45–62, pl. i. (*cf.* also Am. Nat. xvii. p. 975). *P. daunus*, Boisd., larva noticed, unusual duration of pupa-state; *P. rutulus*, Boisd., and *turnus*, Linn., differentiated; the various forms allied to *machaon* and *turnus* respectively must be treated as now being practically species: W. H. Edwards, Papilio, iii. pp. 2–5. *P. thoas*, Linn., *grayi*, Boisd. (pl. iv. fig. 10, larvæ), *evander*, Godt., and *lysithous*, Hübn., xxxvi. pp. 41–45; *P. bunichus*, Hübn., *polydamas*, Linn., and *protodamas*, Boisd., transformations described or noticed, xxxvii. pp. 241–243: E. D. Jones, P. Liverp. Soc. *P. æneas*, Linn., *euristeus* and *eurimedes*, Cram., and other species from Surinam, noticed; Möschler, Verh. z.-b. Wien, xxxi. pp. 303 & 304. *Papilio*: 4 species occur in New Caledonia, *P. montrouzieri*, *amyntor*, and *gelon*, Boisd., and *westwoodi*, Oberth.; *P. gelon*, ♀ described: Lucas, Bull. Soc. Ent. Fr. (6) iii. pp. xlvi. & xlvii. *P. brevicauda*, Saund.: transformations described; Gosse, Canad. Ent. xv. pp. 44–48. *P. cannus*, Westw., var. *agialus* from Singapore described; Distant, Ann. N. H. (5) xii. p. 352. *P. cresphontes*, Cram.,

noticed; Canad. Ent. xv. p. 100, and Papilio, iii. pp. 26 & 43. *P. dehaani*, Feld., noticed; Butler, Ann. N. H. (5) xi. p. 113. *P. hippocrates*, Feld., is distinct from *machaon*, Linn.; *id.* Papilio, iii. p. 63. *P. homerus*, Fabr.: sexual differences noticed; Lucas, Ann. Soc. Ent. Fr. (6) iii. pp. lxiv. & lxv. *P. polydamas*: notes on transformations; the pupa is invariably green or brown, without intermediate gradations, and the colour does not depend upon its surroundings: F. Müller, Kosmos, xii. p. 448 (*cf.* also Meldola, P. E. Soc. 1883, pp. xxiii. & xxiv.). *P. rutulus* feeding on willow; Baron, Papilio, iii. p. 65. *P. tibullus*, Kirby, figured; Waterhouse, Aid, ii. pl. cxxxix. figs. 1 & 2. *P. walshi* and *abboti*, Edw. [forms of *P. ajax*, Linn.], noticed; Mundt, Canad. Ent. xv. pp. 87–99. *P. zolicaon*, Boisd., var. from Nevada described; Lyman, Papilio, iii. pp. 99 & 100.

Thais polyxena, W. V., var. *cassandra*, Hübn., noticed; Millière, Rev. d'Ent. ii. pp. 41 & 42. Varr. from Eubœa noticed; Lucas, Bull. Soc. Ent. Fr. (6) iii. p. xxvii.

Parnassius apollo, Linn. Occurrence at Clovelly; Brooke, Sci. Goss. xix. p. 18.

Papilio antinorii, Oberthür, Ann. Mus. Genov. xviii. p. 711, pl. ix. fig. 4, Abyssinia [remarkable as being a Continental form, allied to the Mascarene *P. meriones*, Feld.]; *P. fulleri*, Camaroons, *diophantus* and *forbesi*, Sumatra, H. Grose Smith, Ent. M. M. xix. p. 234; *P. aberrans* and *inopinatus*, Butler, P. Z. S. 1883, pp. 369 & 370, Timor Laut Islands; *P. alcidinus*, id. Ann. N. H. (5) xi. p. 423, Aru; *P. lurlinus*, id. *op. cit.* xii. p. 106, Victoria Nyanza: spp. nn.

Parnassius imperator, sp. n., C. Oberthür, Bull. Soc. Ent. Fr. (6) iii. p. lxxvii., Thibet.

Pieridæ.

Dewitz, J. Ueber die Bildung des Insectenfühlers. Biol. Centralbl. iii. pp. 582 & 583.

In the larva of *Pieris brassicæ*, long sack-like structures, from which the anteunæ of the imago develop, may be detected at the base of the larval antennæ, below the suture of the clypeus.

Hagen, H. A. . The Genus *Colias*. P. Bost. Soc. xxii. pp. 150–178.

The writer discusses the American species, which he reduces to 9, as follows:—1. *Colias chrysotheme*, Esp. (= *keewaydin*, W. H. Edw.); 2. *C. philodice*, Godt. (= *anthyale*, Hübn., *santes*, Fitch, *eriphyle*, W. H. Edw., and *chrysomelas*, H. Edw.); 3. *C. interior*, Scudd. (= *edwardsi*, *emilia*, *astræa*, *alexandra*, W. H. Edw., *scudderi*, Reak, *occidentalis*, Scudd., *christina*, *harfordi*, H. Edw., and *laurentina*, Scudd.); 4. *C. palæno*, Linn. (= *pelidne*, Boisd., and *chippewa*, W. H. Edw.); 5. *C. meadii*, W. H. Edw.); 6. *C. behri*, W. H. Edw.; 7. *C. hecla*, Lef.; 8. *C. boothi*, Curt.; 9. *C. nastes*, Boisd.

Pieris napi, Linn., and var. *napææ*, Esp., and *Leucophasia sinapis*, Linn., and var. *diniensis*, Boisd., discussed; Fuchs, S. E. Z. xliv. pp. 249–252.

Synchloe monuste, Linn., and *Leptophobia aripa*, Boisd. Transformations noticed; E. D. Jones, P. Liverp. Soc. xxxvii. pp. 240 & 241.

Terias. Butler maintains the distinctions of various forms united by Pryer; Papilio, iii. pp. 63–65. He also remarks on the species allied to *T. hecabe*, Linn., and notices *T. virgo*, Wall., as = *puella*, Boisd.; Ann. N. H. (5) xi. pp. 419 & 421.

Pieris rapæ, Linn., pl. i. figs. 1 & 1*a–d*, *protodice*, Boisd., figs. 2–4, *oleracea*, Boisd., fig. 5, and *monuste*, Linn., fig. 1, pl. x.: ravages, habits, transformations, parasites, &c., noticed; Riley, Rep. Dep. Agric. 1883, pp. 108–118. *P. sisymbrii*, Boisd., figs. 1–5, *a*, *a*²–*c*, *beckeri*, Edw., figs. 8, 9, *d*, *d*², *e*, and *chloridice*, Hübn., figs. 10 & 11, fully described and figured, the first two with transformations; W. H. Edwards, Butt. N. Am. ii. *Pieris*, pl. i. *P.* (*Neophasia*) *menapia*, Feld., *P. beckeri*, Edw., and *P. occidentalis*, Reak., discussed; *P. beckeri* may be only a local race of *P. chloridice*, Hübn., or may be distinct: Hagen, P. Bost. Soc. xxii. pp. 134–141. *P. rapæ* and *napi*: variation; Swinton, Sci. Goss. xix. p. 221, fig. 128. *P. brassicæ* (?) in such a dense swarm as almost to block a road; Littleboy, Tr. Hertf. Soc. ii. p. 96: larvæ feeding at Christmas; Hervey, Ent. xvi. p. 42. *P. crataegi*: cannibalism of imago; Melvill, Ent. xvi. p. 15. *P. melete*, Mén., and *megamera*, Butl., are broods; Pryer, Ent. M. M. xx. pp. 82 & 83. *P. menapia*, Feld.: pupæ attacked by *Simulium*; Hagen, Ent. M. M. xix. pp. 254 & 255. *P. oleracea*, Harr.: habits and pupa noticed; Gosse, Canad. Ent. xv. pp. 48 & 49. *P. protodice* and larva popularly described and figured; Saunders, Rep. E. Soc. Ont. 1882, p. 14, figs. 1–3. *P. rapæ*: scent of live ♂; Perkins, Ent. M. M. xix. p. 236; continued extension in N. America; Dodge, Rep. E. Soc. Ont. 1882, pp. 30 & 31: remedies, &c.; Thomas, Rep. Ins. Illin. xi. pp. 32–36. *P. teutonia*, Fabr., migrating northwards in Australia; King, N. Z. J. Sci. i. p. 390.

Delias timorensis, Boisd., redescribed and figured; Butler, P. Z. S. 1883, p. 368, pl. xxxviii. fig. 6.

Callidryas eubule, Linn. Mountain form with white ♀ recorded from Arizona; W. H. Edwards, Papilio, iii. p. 6.

Catopsilia philea, Linn. Transformations described; Jones, *op. cit.* xxxvi. pp. 40 & 41, pl. iv. fig. 9 (pupæ).

Colias. Keferstein discusses this genus (Verh. z.-b. Wien, xxxii. pp. 449–458), which he divides into four sections, as follows :—

I. All the wings with a black marginal band, varying in breadth, and spotted in the ♀.
II. Both sexes with an unspotted marginal band.
III. The male with a black marginal band, the female without.
IV. Both sexes with a black, spotted, marginal band.

Alphéraky disputes Keferstein's proposal to unite many named forms, and makes short notes on 20 Old-world species; S. E. Z. xliv. pp. 488–495.

Colias anthyale, Hübn., = *philodice*, Godt., nec *pelidne*, Boisd.; Möschler, S. E. Z. xliv. p. 115. *C. hyale*: aberrations described, including a yellow form of ♀; Hasz, Ent. Nachr. ix. pp. 132–134. *C. palæno* reputed to occur in East Greenland; Scoresby & Hagen, Ent. M. M. xx. p. 42.

Ixias satadra, Moore, figured; Waterhouse, Aid, ii. pl. cxxvii. fig. 1.

Anthocharis belemia, Esp. Occurrence at Morlaix; Bellier de la Chavignerie, Feuill. Nat. iii. p. 114.

New species :—

Teriaš subfervens, Corea, p. 278, *invida*, Mindanao, p. 418, *aprica*, Tongatabu, and *vallivolans*, Mindanao, p. 420, Butler, Ann. N. H. (5) xi.; *T. asphodelus*, pl. xxiv. fig. 13, and var. *narcissus*, Mhow, p. 151, *maroensis*, fig. 2, p. 368, and *laratensis*, fig. 3, pl. xxxviii., Timor Laut Islands, p. 369, *id.* P. Z. S. 1883.

Eurema diosa (= *nise*, Boisd., *nec* Cram.), Möschler, Verh. z.-b. Wien, xxxii. pp. 305 & 306, Surinam.

Pieris nelsoni, W. H. Edwards, Butt. N. Am. ii. *Pieris*, pl. i. figs. 6 & 7, Alaska; *P. ogygia*, Trimen, Tr. E. Soc. 1883, p. 356, Natal.

Appias mindanensis (= *domitia*, pt., Semp., *nec* Feld.), Butler, Ann. N. H. (5) xi. p. 421, Mindanao.

Belenois inopinata and *clarissa*, id. *op. cit.* xii. pp. 389 & 390, Fiji Islands; *B. consanguis*, id. P. Z. S. 1883, p. 369, Timor Laut Islands.

Callidryas fisheri (? *agarithe*, var.), H. Edwards, Papilio, iii. p. 43.

Colias aurivillius, Keferstein, Verh. z.-b. Wien, xxxii. p. 457, South Africa.

Ixias birdi, Distant, Ann. N. H. (5) xii. p. 351, Malay Peninsula; *I. depalpura*, Butler, *l. c.* p. 153, pl. xxiv. figs. 6 & 7, Depalpore.

Teracolus intermissus, id. *l. c.* p. 152, pl. xxiv. fig. 4, Kurrachee; *T. aurigineus*, p. 103, *hanningtoni*, p. 104, *miles*, *subvenosus*, and *cinctus*, p. 105, *id.* Ann. N. H. (5) xii., Victoria Nyanza; *T. bowkeri*, Trimen, *l. c.* p. 358, Cape Colony.

Danaidæ.

Moore, F. A Monograph of *Limnaina* and *Euplœina*, two Groups of Diurnal *Lepidoptera* belonging to the Sub-family *Euplœinæ*; with descriptions of new genera and species. P. Z. S. 1883, pp. 201–324, pls. xxix.–xxxii.

Includes a bibliographical introduction, tables of mimetic species, keys to the genera, and a synonymic catalogue, with characters of genera, and descriptions of some new species. The 6 genera of Old World *Danainæ* admitted by the Recorder in 1871 are now raised to 72. Instead of treating this paper in the ordinary manner, it seems better simply to enumerate the whole of the genera, with their types, marking with an asterisk such as are new.

Limnaina.

Nectaria, Dalm., p. 215 (*Pap. idea*, Clerck), **Sabalassa*, p. 217 (*Hestia electra*, Semp.), *Hestia*, Hübn., p. 217 (*Pap. lynceus*, Dru.), **Gamana*, p. 220 (*Idea daos*, Boisd.), *Ideopsis*, Horsf. & Moore, p. 221 (*Idea gaura*, Horsf.), *Radena*, Moore, p. 223 (*Pap. similis*, Linn.), **Cadytis*, p. 226 (*Danais vashti*, Butl.), *Amauris*, Hübn., p. 226 (*Pap. niavius*, Linn.), **Nebroda*, p. 228 (*Pap. echeria*, Stoll.), **Berethis*, p. 228 (*Pap. plexidon*, Fabr.), **Lintorata*, p. 229 (*L. menadensis*, Moore), **Melinda*, p. 229 (*Danais formosa*, Godm.), *Tirumala*, Moore, p. 230 (*Pap. limniace*, Cram.), **Nasuma*, p. 233 (*Pap. ismare*, Cram.), *Anosia*, Hübn., p. 233 (*Pap. plexippus*, Linn.), **Tasitia*, p. 235 (*Pap. gilippus*, Cram.), *Limnas*, Hübn.,

p. 237 (*Pap. chrysippus*, Linn.), *Salatura*, Moore, p. 239 (*Pap. genutia*, Cram.), **Ravadeba*, p. 244 (*Pap. cleona*, Cram.), **Bahora*, p. 245 (*Euplœa philomela*, Zink.), **Phirdana*, p. 245 (*Danais pumila*, Boisd.), **Asthipa*, p. 246 (*Danais vitrina*, Feld.), *Parantica*, Moore, p. 247 (*Pap. aglea*, ram.), **Mangalisa*, p. 248 (*Euplœa albata*), **Caduga*, p. 249 (*Eupl. tytia*, Gray.), *Chittira*, Moore, p. 251 (*Danais famata*, Butl.).

EUPLŒINA.

Hamadryas, Boisd., p. 253 (*Pap. zoilus*, Fabr.), **Vonona*, p. 257 (*Eupl. goudoti*, Boisd.), **Nipara*, p. 257 (*Eupl. helcita*, Boisd.), **Oranasma*, p. 258 (*Eupl. lugens*, Butl.), **Patosa*, p. 259 (*Crastia funerea*, Butl.), **Sarobia*, p. 260 (*Eupl. grayi*, Feld.), **Vadebra*, p. 260 (*Pap. climena*, Cram.), **Lontara*, p. 261 (*Eupl. wallacii*, Feld.), **Gamatoba*, p. 262 (*Eupl. æthiops*, Butl.), **Menama*, p. 264 (*Eupl. camaralzeman*, Butl.), **Tronga*, p. 266 (*Eupl. crameri*, Luc.), **Sabanosa*, p. 269 (*Eupl. cratis*), **Adigama*, p. 269 (*Eupl. ochsenheimeri*, Moore), **Chanapa*, p. 270 (*Danais corinna*, Macl.), **Andasena*, p. 270 (*Danais swainsoni*, Godt.), **Deragena*, p. 272 (*Eupl. proserpina*, Butl.), **Bibisana*, p. 273 (*Eupl. horsfieldi*, Feld.), **Betanga*, p. 273 (*Eupl. megæra*, Butl.), **Penoa*, p. 274 (*Danais alcathoe*, Godt.), *Crastia*, Hübn., p. 276 (*Pap. core*, Cram.), **Mahintha*, p. 280 (*Eupl. subdita*, Moore), **Karadira*, p. 281 (*Eupl. andamanensis*, Atk.), **Pramasa*, p. 281 (*Eupl. mitra*, Moore), **Tagata*, p. 282 (*Eupl. abjecta*, Butl.), **Pramesta*, p. 282 (*Eupl. tobleri*, Semp.), **Rasuma*, p. 282 (*Calliplœa violetta*, Butl.), **Chirosa*, p. 284 (*Eupl. brenchleyi*, Butl.), **Mestapra*, p. 285 (*Eupl. fraudulenta*, Butl.), *Trepsichrois*, Hübn., p. 286 (*Pap. claudia*, Fabr.), **Glinama*, p. 288 (*Eupl. euctemon*, Hew.), *Euplœa*, Fabr., p. 288 (*Pap. corus*, Fabr.), *Calliplœa*, Butl., p. 292 (*Danais darchia*, Macl.), **Danisepa*, p. 296 (*Pap. rhadamanthus*, Fabr.), **Tabada*, p. 297 (*Eupl. hyacinthus*, Butl.), **Satanga*, p. 297 (*Eupl. eupator*, Hew.), **Saphara*, p. 297 (*Eupl. treitschkii*, Boisd.), **Selinda*, p. 298 (*Eupl. mniszechi*, Feld.), **Hirdapa*, p. 299 (*Eupl. usipetes*, Hew.), *Salpinx*, Hübn., p. 300 (*S. nemertes*, Hübn.), **Pademma*, p. 305 (*Eupl. klugi*, Moore), **Nacamsa*, p. 310 (*N. simillima*, Moore), *Isamia*, Moore, p. 311 (*Pap. superba*, Herbst), **Tiruna*, p. 316 (*T. roepstorffi*, Moore), **Anadara*, p. 317 (*Salpinx gamelia*, Hübn.), **Doricha*, p. 317 (*Pap. sylvester*, Fabr.), *Narmada*, Moore, p. 318 (*Eupl. coreoides*, Moore), *Stictoplœa*, Butl., p. 319 (*Eupl. gloriosa*, Butl.).

Moore, *l. c.*, figures the following known species :—*Radena persimilis*, Moore, pl. xxxi. fig. 4, *juventa*, Cram., pl. xxix. fig. 1 ; *Tirumala gautama*, Moore, pl. xxxi. fig. 3, *septentrionis*, Butl., pl. xxix. fig. 3 ; *Salatura nipalensis*, Moore, pl. xxxi. fig. 2 ; *Tronga bremeri*, Feld., pl. xxix. fig. 5 ; *Penoa deione*, Westw., fig. 2, *limborgi*, Moore, fig. 7, pl. xxx. ; *Crastia core*, Cram., fig. 8, *distanti*, Moore, fig. 6, pl. xxix., *camorta*, Moore, fig. 7 ; *Pramasa mitra*, Moore, fig. 8, pl. xxxi. ; *Pademma klugi*, Moore, pl. xxxii. fig. 1, *kollari*, Feld., pl. xxix. fig. 9 ; *Isamia splendens*, Butl., pl. xxx. fig. 3, *midamus*, Linn., fig. 5, *alopia*, Godt., fig. 7, pl. xxxii., *margarita*, Butl., pl. xxx. fig. 5, *chloe*, Guér., pl. xxix. fig. 7 ; *Narmada coreoides*, Moore, pl. xxix. fig. 10 ; and *Stictoplœa binotata*, Butl., and *harrisi*, Feld., pl. xxx. figs. 4 & 8.

Danais crippus, Cram., pl. vi. fig. 1 (larva), *Mechanitis lysimnia*, Fabr., and *Sais eurganassa*, Feld. Transformations described or noticed; E. D. Jones, P. Liverp. Soc. xxxvi. pp. 28 & 29, & xxxvii. pp. 233 & 234.

New species (*for New genera*, vide suprà).

Hestia stolli (= *idea*, Stoll), Java, *reinwardti* (= *lynceus*, Dist.), Sumatra, Nias, Malacca, *logani* (= *lynceus*, pt., Dist.), Malacca, Penang, *donovani*, Singapore, p. 218, and *drurii* (= *idea* var., Doubl. & Hew.), Sumatra, p. 219, Moore, P. Z. S. 1883.

Gamana costalis, id. *l. c.* p. 221, Nias.

Ideopsis glaphyra (Semper, MS.), *id. l. c.* p. 222, Philippines.

Radena manillana, Manilla, *luzonica*, North Luzon, p. 224, *curtisi*, Batchian, p. 225, *id. l. c.*

Lintorata menadensis, id. *l. c.* p. 229, Menado.

Tirumala conjuncta, pl. xxix. fig. 2, Java, p. 231, *ishmoides*, Celebes, and *angustata*, Tongatabu, Friendly Islands, p. 232, *id. l. c.*

Limnas alcippoides, pl. xxxi. fig. 1, Nepal, *batavianα* (= *chrysippus*, Horsf. & Moore), Java, p. 238, and *bowringi*, Hong Kong, p. 239, *id. l. c.*

Salatura intensa (= *plexippus*, Horsf. & Ziuk., = *philene*, Moore), Java, Lombok, Borneo, p. 240, *intermedia* (= *genutia* var., Dist.), Malacca, Singapore, p. 241, *sumatrana*, Sumatra, *mysolica*, Mysol, p. 242, *aruana*, Aru, and *nigrita*, Australia, p. 243, *id.* l. c.; *S. laratensis*, Butler, P. Z. S. 1883, p. 367, pl. xxxviii. fig. 5, Timor Laut Islands.

Parantica melanoides (= *aglea*, Marsh. & De Nicév.), Moore, *l. c.* p. 247, East Indies.

Caduga niphonica, Nikko, p. 249, *loochooana*, Loo Choo, *swinhoei*, N. Formosa, *pseudomelaneus*, Java, p. 250, and *banksi* (? = *melaneus*, Dist.), Sumatra, p. 251, *id. l. c.*

Nipara intermedia and *indistincta*, id. *l. c.* p. 258, Raratonga.

Oranasma smithi, id. *l. c.* p. 259, New Guinea.

Gamatoba monilifera, Thursday Island, p. 262, *diadema*, New Guinea, *spiculifera*, Buru, p. 263, *id. l. c.*

Menama tavoyana, pl. xxx, fig. 6, Tenasserim, *lorza*, fig. 5, N. Borneo, and *mouhotii*, fig. 6, pl. xxxi. *id. l. c.* p. 265.

Tronga biseriata, Nicobar Islands, *marsdeni*, Singapore, p. 266, *olivacea*, Tenasserim, and *niasica*, Nias, p. 267, *brookii*, Sarawak, *labuana* and *daatensis*, p. 268, and *pryeri*, N. Borneo, p. 269, *id. l. c.*

Chanapa sacerdos, Butler, *l. c.* p. 366, pl. xxxviii. fig. 7, Timor Laut Islands.

Andasena suluana, Sulu, and *lucasi*, Mindanao, Moore, *l. c.* p. 271.

Deragena childreni, id. *l. c.* p. 272, Java.

Betanga dodingensis, id. *l. c.* p. 274, Dodinga.

Penoa transpectus, id. *l. c.* p. 275, Billiton Island.

Crastia graminifera, Malay Peninsula, p. 277, *binghami*, Upper Tenasserim, p. 278, *inconspicua*, Sumatra, p. 279, *prunosa*, China, and *snelleni*, Philippines, p. 280, *id. l. c.*

Rasama ordinata, p. 282, *denticulata*, *bipunctata*, *pleiadis* (= *dolosa*, ♀, Butl.), *louisa*, *siderea*, p. 283, *astræa*, and *stella*, p. 284, *id. l. c.*, New Guinea.

Trepsichrois linnæi (= *midamus*, pt., auctt.), pls. xxix. fig. 4, & xxx. fig. 1, E. Indies, p. 286, *verhuelli*, Nias, p. 287, and *kochi*, Philippines, p. 288, Moore, *l. c.*

Euplœa drucii, Siam, *grandis*, locality unknown, *butleri*, Borneo, p. 290, and *godmani*, N. Borneo, p. 291, *id. l. c.*

Calliplœa aristotelis, N. Borneo, p. 292, *mariesis*, N. China, *monilis*, Mindanao, *engrammelli*, Gilolo, and *kirschi*, Waigiou, p. 293, *id.* l. c.; *C. visenda*, Butler, *l. c.* p. 367, pl. xxxviii. fig. 1, Timor Laut Islands.

Saphara ursula, id. Ann. N. H. (5) xi. p. 407, Admiralty Islands.

Salpinx lazulina (= *vestigiata*, pt., Butl.), Malacca, p. 300, *oculata*, Philippines, *bouruana*, Buru, p. 302, *weberi*, *brandti*, Celebes, p. 304, and *labreyi*, locality unknown, p. 305, Moore, *l. c.*

Padenma dharma, fig. 2, *augusta*, *indigofera*, fig. 3, p. 306, *imperialis*, *regalis*, Bengal, p. 307, *pembertoni*, Pegu, fig. 6, *macclellandi*, Assam, fig. 4, *uniformis*, Bengal, *apicalis* (= *crassa*, Dist.), Burma, Malay Peninsula, p. 308, *burmeisteri*, Cochin China, Tenasserim, p. 309, *id. l. c.* pl. xxxii.

Nacamsa simillima and *meldolæ*, id. *l. c.* p. 310, Philippines.

Isamia sinica, S. China, p. 312, *marseuli*, Saigon, Cochin China, p. 313, *brahma* (= *margarita*, Dist.), Moulmein, *dejeani*, Sumatra, Malacca, *rafflesi*, Java, p. 314, *fabricii*, Cochin China, *singapura*, Singapore, *sophia*, Sumatra, p. 315, *lowii*, Borneo, and *dameli*, Shanghai, p. 316, *id. l. c.*

Tiruna rœpstorffi, id. *l. c.* p. 316, Andamans.

Stictoplœa regina, Cachar, p. 319, *tyrianthina*, Borneo, Sumatra, *pygmœa*, Cachar, p. 320, *lacordairii*, Java, p. 321, and *watsoni*, Buru, p. 322, *id. l. c.*

Acræidæ.

Marshall & De Nicéville, Butt. Ind. i. pt. 2, pp. 317–321, woodcut, redescribe *Pareba vesta* and *Telchinia violæ*, Fabr., and figure the latter.

Acræa pellenea, Hübn. (pl. iv. fig. 7), and *alalia*, Feld., var.: transformations described; E. D. Jones, P. Liverp. Soc. xxxvi. pp. 36 & 37, and also xxxvii. p. 234. *A. thalia*, Linn., is frequently attacked by birds, and portions bitten out of the wings; F. Müller, Kosmos, xiii. pp. 197–201, figs. The ♀ has horny appendages, analogous to those of *Parnassius*; id. Zool. Anz. vi. pp. 415 & 416.

Telchinia nero and *perrupta*, spp. nn., Butler, Ann. N. H. (5) xii. p. 102, Victoria Nyanza.

Acræa arcticincta, sp. n., *id. l. c.* p. 103, Victoria Nyanza.

Alæna interposita, sp. n., *id. ibid.*, Victoria Nyanza.

Heliconiidæ.

Heliconius eucrate, Hübn., is frequently attacked by birds; Meldola & F. Müller, P. E. Soc. 1883, p. xxiii. *H. erato*, L. (*vesta*, Cram.): Möschler, Verh. z.-b. Wien, xxxii. pp. 315 & 316, tabulates the various forms of this species, including *erato*, L., *thelxiope*, Hübn., *andremona* and

erythræa, Cram., *palantia* and *funebris*, Möschl., *deiopia*, Plötz, and *cybele*, Cram.

Heliconia narcæa, Godt. Transformations described and figured; Moreira, Arch. Mus. R. Jan. iv. pp. 1–13, pl. i.

Eueides dianasa, Hübn. Transformations described; E. D. Jones, P. Liverp. Soc. xxxvi. pp. 37 & 38.

Nymphalidæ.

Swinton, A. H. A Study of the Variation of *Vanessa urticæ*, and of some other Butterflies. Sci. Goss. xix. pp. 107–110, woodcuts.

W. F. Kirby has published one part of "Introductory Papers on *Lepidoptera*," completing the *Nymphalinæ*; Ent. xvi. pp. 122–124.

On the pupation of the *Nymphalidæ*; Riley, Bull. Phil. Soc. Wash. iii. pp. 41–43 [1880].

Synoptic tables of the North American species of the following genera are given in Bull. Brooklyn Soc. v. & vi.:—*Melitæa*, *Phyciodes*, *Vanessa*, *Pyrameis*, *Junonia*, *Limenitis*, *Eresia*, *Synchloe*, *Cystineura*, *Anartia*, *Eurema*, *Ageronia*, *Eunica*, *Callicore*, *Timetes*, *Victorina*, *Heterochroa*, *Aganisthos*, and *Vanessa* (*Grapta*).

D. P. [illegible] (Rhop. Mal.) figures and redescribes the following known species:—*Doleschallia pratipa*, Feld., pls. ix. fig. 6, xi. fig. 8, p. 88; *Precis iphita*, Cram. (= *intermedia*, Feld.), pls. ix. fig. 5, xi. fig. 9, p. 90, *ida*, Cram., fig. 10; *Junonia atlites*, Linn. (= *laomedia*, Clerck.), figs. 11 & 12, p. 93, *asterie*, Linn., figs. 1 & 2, p. 94, *lemonias*, Linn., fig. 5, pl. xi. p. 96; *Rhinopalpa fulva*, Feld., pl. xii. figs. 1 & 2, p. 98, *R.* (?) *eudoxia*, Guér., pl. xvii. fig. 6, p. 99; *Eulacura osteria*, Westw., pl. xii. figs. 5 & 6, p. 100; *Charaxes echo*, Butl., woodcut, fig. 38, p. 103, *schreiberi*, Godt., pl. xiii. fig. 2, p. 104, *delphis*, Doubl., pl. xv. fig. 1, p. 105, *athamas*, Dru., var. *samatha*, Moore, pl. xiii. fig. 8, p. 106, *hebe*, Butl., pl. xv. fig. 2, p. 107, *jalysus*, Feld., fig. 4, p. 108, *harpax*, Feld., fig. 1, p. 109; *Prothoe caledonia*, Hew., fig. 9, pl. xiii. p. 110; *Symphædra dirtea*, pl. xii. figs. 7 & 8, p. 112, *S.* (?) *emalea*, Guér., p. 114; *Euthalia derma*, Koll., pl. xix. fig. 4, p. 116, *anosia*, Moore, fig. 5, *garuda*, Moore, figs. 1 & 2, pl. xiv. (larva, woodcut, fig. 39, p. 115), p. 117, *jama*, Feld., pls. xiv. fig. 8, xv. fig. 4, *laverna*, Butl., pl. xiv. fig. 7 (and woodcut, fig. 40, p. 120), p. 119, *adonia*, Cram., var., pl. xix. figs. 10 & 11, p. 120, *decorata*, Butl., pl. xiv. fig. 9 (and woodcut, fig. 41), *ramada*, Moore, pl. xix. fig. 5, p. 122, *cocytina*, Horsf., pl. xviii. fig. 7, *puseda*, Moore (= *monima*, Butl., ? Fabr.), and *ludekingi*, Butl. (*nec* Voll.), pls. xviii. fig. 8, xv. fig. 3, p. 125, *asoka*, Feld., pls. xv. fig. 5, xiv, fig. 3, p. 127, *lubentina*, Cram., pl. xiv. fig. 4, p. 128; *Tanœcia flora*, Butl., pl. xviii. fig. 6, p. 129, *supercilia*, Butl., fig. 8, *violaria*, Butl., fig. 9, *pulasara*, Moore (= *varuna*, Butl., *nec* Voll.), pls. xix. fig. 6, xiv. fig. 13, & xviii. fig. 9 (var. *indras*, Voll.), p. 130, *aruna*, Feld., pl. xv. fig. 7, *robertsi*, Butl., p. 132; *Euripus euploœoides*, Feld., pl. xiii. figs. 6 & 7, p. 134, *pfeifferæ*, Feld., woodcut, fig. 42, p. 135; *Euryteia castelnaui*, pl. xv. fig. 10, p. 136; *Ergolis ariadne*, Linn., pl. xi. fig. 6, p. 137, *merione*, Cram., pl. xv. fig. 6, p. 138, *isæus*, Wall., p. 139; *Cyrestis nivea*, Zink., var. *nivalis*, Feld., pl. xii. fig. 3, p. 140; *Parthenos gambrisius*,

Fabr., var. *lilacinus*, Butl., pl. xi. fig. 7, p. 143; *Lebadea martha*, Fabr. (= *alankara*, Horsf.), pl. xvii. figs. 10 & 11, p. 145; *Pandita sinope*, Moore, pl. xii. fig. 13, p. 146; *Limenitis procris*, fig. 1, p. 148; *Neptis hordonia*, Stoll, fig. 13, *peraka*, Butl., fig. 2, p. 150, *dindinga*, Butl., fig. 5, *tiga*, Moore, fig. 4, p. 152, and var. *dorelia*, Butl., fig. 3, pl. xvii., *vikasi*, Horsf. (var. *omeroda*, Moore), pl. xvi. fig. 3, p. 152, *ophiana*, Moore, fig. 12, p. 153, *leuconata*, Butl., fig. 14, pl. xvii, *rata*, Moore, fig. 1, *gononata*, Butl., fig. 2, pl. xviii. p. 154, *duryodana*, Moore, var., pl. xvi. fig. 15, *charon*, Butl., woodcut, fig. 43, p. 155, *eurynome*, Westw., var. *mamaja*, Butl., fig. 14, p. 156; *Athyma perius*, Linn. (= *leucothoe*, Linn.), fig. 2 (and woodcut, fig. 44, larva), p. 157, *larymna*, Doubl. & Hew., fig. 1, p. 159, *idita*, Moore, figs. 9 & 10, *pravara*, Moore, fig. 11, p. 160, *abiasa*, Moore, var. *clerica*, Butl., fig. 8, *kresna*, Moore, fig. 3, p. 161, *amhara*, Druce, fig. 5, p. 162, *nefte*, Cram., var. *nivifera*, Butl., figs. 6 & 7, p. 163, *subrata*, Moore, fig. 4, *urvasi*, Feld., fig. 12, pl. xvi. p. 164; *Hypolimnas bolina*, Linn., pls. xii. figs. 10 & 12, xv. fig. 12, p. 165, *incommoda*, pl. xvii. figs. 8 & 9, *misippus*, Linn. (= *chrysippus*, Sulz.), pl. xiii. figs. 9 & 11, xv. fig. 11, p. 167, *anomala*, Wall., p. 169; *Cethosia logani*, Dist., fig. 5, p. 170, *methypsa*, Butl., fig. 9, p. 171, *hypsina*, Feld., figs. 6–8, pl. viii. p. 172; *Atella phalanta*, Dru., pl. ix. fig. 4 (and woodcut, fig. 45, larva), *alcippe*, Cram., woodcut, fig. 46, p. 174, *sinha*, Koll., pl. x. fig. 8, p. 175; *Cyrpha erymanthis*, Dru., pl. viii. fig. 4, p. 176; *Cirrochroa orissa*, Feld., pl. x. fig. 9, *satellita*, Butl., fig. 9, p. 178, *bajadeta*, Moore (= *ravana*, Moore, and *malaya*, Druce), figs. 1 & 2, pl. xix., *clagia*, Godt., pl. xvii. fig. 7, p. 179, *malaya*, Feld. (= *johannes*, Butl.), figs. 3 & 4, p. 180, *rotundata*, Butl., fig. 10, p. 181, *robertsia*, Butl., fig. 7, p. 182, *teuthras*, Hew. (= *viola*, Wall.), fig. 6, p. 183; *Cynthia deione*, Erichs. (= *arsinoe*, Druce, and *erotella*, Butl.), figs. 1 & 2, p. 184, and *cantori*, Dist., fig. 5, pl. x. p. 185.

The following known species of *Nymphalidæ* are figured by Godman & Salvin, Biol. Centr. Am. *Rhop.*:—*Eunica amata*, Druce, figs. 1 & 2; *Myscelia rogenhoferi*, Feld., figs. 3 & 4; *Epiphile grandis*, Butl., figs. 5–7, *plutonia*, Bates, figs. 8–10; *Bolboneura sylphis*, Bates, figs. 11 & 12; *Epicalia aglaura*, figs. 13–15, pl. xxiv., *chromis*, Doubl. & Hew., figs. 1 & 2; *Cyclogramma bacchis*, Doubl. (= *bimaculata*, Hew.), figs. 3 & 4; *Eubagis theseus*, Feld., figs. 7 & 8, *anubis*, Hew., fig. 9, *thalassina*, Boisd. (= *immarginata*, G. & S.), figs. 10–12, *salpensa*, Feld., figs. 13 & 14, *chryseis*, Bates, figs. 15 & 16, *sosthenes*, Hew., figs. 17–19, *glauce*, Bates, figs. 20–22, pl. xxiv.*a*; *Callicore neglecta*, Salv., figs. 1 & 2, *eupepla*, G. & S., figs. 3 & 4, *astala*, Guér. (= *cornelia*, Herr.-Schäff.), figs. 5 & 6; *Catagramma faustina*, Bates, figs. 7 & 8, *casta*, Salv., figs. 9 & 10, *titania*, Salv., figs. 12–14, *pacifica*, Bates (= *bugaba*, Staud.), figs. 15 & 16, *denina*, Hew. (*guatemalena*, Bates), figs. 17 & 18, and *tolima*, Hew., fig. 19, pl. xxv.; *glauconome*, Bates (= *œnoe*, Boisd.), figs. 9 & 10, *atlantis*, figs. *temalena*, figs. 1 & 2, and *iphthime*, Bates, figs. 3 & 4, pl. xxvi. *rene superba*, Bates (= *aphrodite*, Butl.), figs. 1 & 2; *Timet* Westw., figs. 7–10, and *phiale*, Godm. & Salv., fig. 11, pl. xxvii. Meldola

Godman & Salvin, *l. c.*, note the following synonymy:—*Eunica* G. & S., = *tatila*, Herr.-Schäff.; *Myscelia cyanecula*, Feld., = *ethusa*, Boisd.; *Catagramma phytas*, Boisd., = *anna*, Guér.; *Peridromia arethusa*,

Cram., = *arete*, Luc.; *amphinome*, Linn., = *mexicana*, Luc.; *Didonis biblis*, Fabr., = *hyperia*, Cram., and *pasira*, Doubl.; *Timetes marcella*, Feld., = *corinna*, Doubl. & Hew., *valetta* and *corita*, Butl. & Druce, and *napo*, Boisd.

E. D. Jones, P. Liverp. Soc., notices the transformations of *Junonia cœnia*, Hübn., *Ageronia amphinome*, Linn. (pupa figured, pl. iv. fig. 8), xxxvi. pp. 38–40; *Dione juno*, Cram., *vanillæ*, Linn., *Ageronia ferentina* and *Heterochroa syma*, Godt., and *Siderone isidora*, Cram., xxxvii. pp. 235–240.

On the *Vanessidæ* of Simbirsk (10 species); Umnova, Bull. Mosc. lvii. (2) pp. 94–97.

Argynnis nerippe, Feld., *cereana* and *vorax*, Butl., noticed, and the ♀ of the last described; Butler, Ann. N. H. (5) xi. pp. 109 & 110. *A. lathonia* and *dia* in coitu; Elwes, P. E. Soc. 1883, p. xxxiii. *A. aphirope*, albino, var. *isabella* noticed; Sahlberg, Medd. Soc. Fenn. ix. p. 160. *A. cybele* in ovipositing drops its egg a height of about a foot; Skinner, P. Ac. Philad. 1883, p. 36. *A. dia* reputed to occur in East Greenland; Scoresby & Hagen, Ent. M. M. xx. p. 42. *A. euphrosyne* noticed in Sutherlandshire; Stainton, Ent. M. M. xx. p. 81: variety described; Eaton, Sci. Goss. xix. p. 164. *A. [illegible]hea. [illegible]me*, Edw., var. *erinna* from Colorado described; W. H. Edwards, [illegible]llou, Ann. xv. p. 33. *A. nausicaa*, W. H. Edwards, noticed [illegible]; *[illegible]nira* varr. pp. 6 & 7. *A. pales*, W. V., var. *inducta* from the frontiers of [illegible] with [illegible]escribed; Sandberg, Ent. Tidskr. iv. pp. 129, 130, & 224. [illegible]ticed

Melitæa artemis feeding on honeysuckle; [Mrs.] M. S. Jenkyns, Ent. xvi. p. 14. *M. athalia*, Rott.: aberration described; Fromholz, B. E. Z. xxvii. p. 239. *M. chalcedon*, Doubl. & Hew.: hibernation, variation, and larva noticed; Rivers & Wright, Papilio, iii. pp. 26 & 123. *M. colon* and *perdiccas*, W. H. Edw.: note on localities; Tepper, Bull. Brooklyn Soc. v. p. 81.

Vanessa polychloros and *antiopa* have a row of bristles on the basal half of the costa, which are not present in *urticæ*, *io*, and *atalanta*; Snellen & Stainton, Ent. M. M. xx. pp. 81 & 82, and Tijdschr. Ent. xxvi. p. cxxxv.

Vanessa antiopa and *Pyrameis atalanta*. Hibernation; Grote, Canad. Ent. xv. p. 40.

Vanessa io: minute structure of club of antennæ described; Chatin, C.R. xcvii. pp. 677–679: ab. *dyophthalmica* described; Garbini, Bull. Soc. Pad. i. pp. 19 & 20. *V. io* and *ioides*: it is probable that the dwarf form *ioides* is reared from larvæ which have fed on the flowers instead of the leaves of the nettle; Bernard, Ent. Nachr. ix. pp. 26 & 27. *V. [illegible]s.* xv. [illegible], Godt.: transformations noticed; Gosse, Canad. Ent. xv. [illegible] *Tanæcia [illegible]laria*, Bu[illegible] *volychloros*: full-fed larva uninjured by cyanide; Finch, Sci. [illegible] fig. 6, xi[illegible] 190. *V. urticæ*: colour of pupæ in England and Switzerland; [illegible] Feld., pl. [illegible] Jenkyns, Ent. xvi. pp. 13 & 14: not constantly smaller in th[illegible] pl. xiii. fi[illegible]Man than in England; Porritt, Ent. M. M. xx. p. 113.

[illegible]*eis atalanta*, *cardui*, and *callirhoe* mentioned; Dent, P. Manch. Soc. xxi. pp. 128 & 129.

Pyrameis atalanta, Linn.: habits of larva described; W. H. Edwards,

Canad. Ent. xv. pp. 14–20: peculiar figure-like markings on under-surface; Gunning, Sci. Goss. xix. p. 189. *P. huntera* laying its eggs, by mistake, on *Artemisia ludoviciana*; [Miss] Murtfeldt, Am. Nat. xvii. p. 196.

Vanessa callirhoe noticed in Madeira; Cockerell, Sci. Goss. xix. pp. 158 & 159. *V. cardui*: abundance and migration in France in 18[illegible]; according to Oberthür, the specimens were of the African type; Bellevoye, Bull. Soc. Metz (2) xv. pp. 161–164. *V. gonerilla*, Fabr.: life-history; Hudson, Ent. xvi. pp. 217–219.

Vanessa amestris, Dru., and *octavia*, Cram., run into one another, and are probably not truly distinct; *V. abyssinica*, Feld., fig. 5, *schæneia*, Trim., figs. 1 & 3, and *hippomene*, Hübn., discussed: Oberthür, Ann. Mus. Genov. xviii. pp. 721–725, pl. ix.

Hypanis ilithyia, Dru., and var. *polinice*, Boisd., discussed; *id. l. c.* pp. 725–727.

Hypolimnas antilope, Cram., redescribed; Butler, Ent. M. M. xx. p. 55.

Limenitis arthemis: note on times of appearance; [Mrs.] Heustis, Canad. Ent. xv. pp. 57 & 58. *L. camilla*, W. V.: its occurrence on the Rhine; Fuchs, S. E. Z. xliv. p. 253. *L. eros*, W. H. Edwards: transformations described and figured by him; Butt. N. [illegible], *alcippe* [illegible] *Lim.* pl. ii. *L. populi*: hermaphrodite noticed; Tarlé, Feuill. Nat. [illegible]7: hiberlation of larva; Hensel, JB. Annab. Ver. iv. [1876], *Cypha erp*[illegible] pl. x. fig. ♂, pl. i. *L. ursula* and *disippus* suspected to be dimorphic [illegible], Moore one species; Mundt, Papilio, iii. p. 26. fig

Neptis astola, Moore, redescribed; Butler, P. Z. S. 1883, p. 146.

Apatura antonia, Edw., var. *montis* from Arizona described; W. H. Edwards, Papilio, iii. p. 7. *A. bhavana*, Moore, figured; Waterhouse, Aid, ii. pl. cxxvii. fig. 2.

Agrias beatifica, Hew., variation discussed; *A. stuarti*, Godm. & Salv., is not truly distinct: Godman & Salvin, P. Z. S. 1883, pp. 384–386.

Nymphalis brutus, Cram., and *ethalion*, Boisd., noticed in the Transkei; Sci. Goss. xix. pp. 281 & 282.

Megistanis deucalion, Feld., = *bæotus*, Doubl. & Hew.; Möschler, Verh. z.-b. Wien, xxxii. pp. 317 & 318.

Paphia troglodyta, Fabr. The following are synonyms:—*astinax*, Cram., *glycerium*, Edw. (*nec* Doubl.), and *andria*, Scudd.; W. H. Edwards, Canad. Ent. xv. p. 36.

New genera and species:—

Timelæa, Lucas, Bull. Soc. Ent. Fr. (6) iii. p. xxxv. Allied to *Argynnis* and *Melitæa*; labial palpi scaly; antennæ not abruptly clavate; wings slender, rounded. Type, *M.* (?) *maculata*, Brem. & Grey.

Panacea, Godman & Salvin, Biol. Centr. Am. *Rhop.* i. p. 274 (= *Pandora*, Westw.; nom. preocc.).

Chersonesia, Distant, Rhop. Mal. p. 142. Allied to *Cyrestis*; first subcostal of fore-wings emitted before the termination of cell, second emitted between the apex of cell and base of third subcostal. Type, *Cy. rahria*, Horsf. & Moore (redescribed and figured, *ibid.* pl. xii. fig. 4).

Cethosia gabinia, Weymer, Ent. Nachr. ix. p. 191, Nias.

Argynnis butleri, W. H. Edwards, Canad. Ent. xv. p. 32, N.W. America, Novaya Zemlya.

Pyrameis braziliensis, Moore, P. Liverp. Soc. xxxvii. p. 236 (transformations described by E. Dukinfield Jones, p. 237), Brazil.

Junonia wallacii, Distant, Rhop. Mal. p. 95, pl. xi. figs. 3 & 4, Malay Peninsula, Java.

Precis expansa, Butler, P. Z. S. 1883, p. 367, Timor Laut Islands; *P. sesamus*, Trimen, Tr. E. Soc. 1883, p. 347, S. Africa.

Hypanis simplex, Butler, *l. c.* p. 146, pl. xxiv. fig. 8, Depalpore (India).

Epiphile plusios, Godman & Salvin, Biol. Centr. Am. *Rhop.* i. p. 236, Costa Rica, Panama.

Eubagis ate, iid. *l. c.* p. 247, pl. xxiv.*a*, figs. 5 & 6, Guatemala.

Catagramma ærias, Nicaragua, Costa Rica, Panama, and *rutila*, Mexico, *iid. l. c.* pp. 259 & 262; *C. branickii*, Oberthür, Études d'Ent. vii. p. 15, pl. ii. fig. 11, Huambo, Peruvian Amazons.

Panacea lysimache, Godman & Salvin, *l. c.* p. 275, Panama.

Ageronia lelaps, iid. *l. c.* p. 270, Mexico.

Peridromia arienis, iid. *l. c.* p. 272, pl. xxvi. figs. 11 & 12, Panama.

Cyrestis cocles, Distant, Ann. N. H. (5) xi. p. 174, and Rhop. Mal. p. 141, pl. xiii. fig. 1, Gallou, Ann. [illegible]ea; *C. tabula*, De Nicéville, J. A. S. B. lii. p. 1, pl. i. fig. 1, *C. [illegible]anira* varr.

Hypolimnas with *H.* Fiji, p. 413, *thomsoni*, Tongatabu, Fiji, *moseleyi* and *naresi*, Tonga, noticed p. 414, Butler, Ann. N. H. (5) xi.; *H. alcippoides*, id. *op. cit.* xii. p. 102, Victoria Nyanza; *H. forbesi*, id. P. Z. S. 1883, p. 367, pl. xxxviii. fig. 4, Timor Laut Islands; *H. eremita*, id. Ent. M. M. xx. p. 56, Dorey.

Limenitis æmonia, Weymer, *l. c.* p. 193, Nias.

Moduza imitata, Butler, Ent. M. M. xx. p. 54, Nias.

Pandita imitans, id. *ibid.*, Nias.

Neptis eurymene, Mhow, and *swinhoei*, Nilgiris, *id.* P. Z. S. 1883, p. 145, pl. xxiv. figs. 5 & 9, India.

Euthalia macnairi, figs. 6 & 10, p. 123, *stoliczkana*, fig. 11, and *maclayi*, fig. 12, p. 124, Distant, Rhop. Mal. pl. xiv., Malay Peninsula; *E. pyxidata*, Weymer, *l. c.* p. 195, Nias.

Charaxes moori, Distant, *l. c.* p. 108, pl. xiii. fig. 3, Malay Peninsula; *C. niasicus*, Butler, Ent. M. M. xx. p. 56, Nias; *C. porthos*, p. 57, *nichetes*, Camaroons, and *nepenthes*, Siam, p. 58, H. Grose Smith, Ent. M. M. xx.

Paphia morrisoni, W. H. Edwards, Canad. Ent. xv. p. 35, Western Texas, Arizona.

—— *helmsi*, Fereday, Tr. N. Z. Inst. xv. p. 193, New Zealand [referred to the *Nymphalidæ*, without indication of affinities].

MORPHIDÆ.

Marshall & De Nicéville, Butt. Ind. i. pt. 2, pp. 281–316, describe the *Morphinæ* of India, &c., adding figures (chiefly woodcuts) of the following known species:—*Xanthotænia busiris*, Westw., *Zeuxidia doubledayi*, Westw., *Amathusia phertheus*, Feld., *Discophora celinde*, Stoll, *tullia*,

Cram., *Enispe euthymius*, Doubl., *Æmona amathusia*, Hew. (front., figs. 2 & 2*a*), *peali*, Wood-Mason (front., figs. 3 & 3*a*), *Thaumantis ramdeo*, Moore, *Stichophthalma camadena*, Westw., and *Clerome assama*, Westw.

Discophora tullia, Cram. Distant maintains that the Malayan form figured by him is really this species, and not *D. zal*, Westw. ; Ann. N. H. (5) xii. pp. 352 & 353.

Morpho. On the specific claims of various species; Müschler, Verh. z.-b. Wien, xxxii. pp. 318 & 319. *M. hercules*, Dalm. (pupæ, pl. iii. fig. 2), and *epistrophis*, Hübn. : transformations described ; E. D. Jones, P. Liverp. Soc. xxxvi. pp. 30–33.

Enispe tessellata, sp. n., Moore, P. Z. S. 1883, p. 521, Darjiling, Nepal.

Drusilla pleiops, sp. n., Kirsch, B. E. Z. xxvii. p. 164, Port Moresby, New Guinea (= *butleri*, Oberth. ; *tom. cit.* p. 304).

Tenaris birchi, sp. n., Distant, Ann. N. H. (5) xii. p. 241, Singapore.

Xanthotænia obscura, sp. n., Butler, Ent. M. M. xx. p. 54, Nias.

Brassolidæ.

Brassolis astyra, Godt. (fig. 3, pupa), and *Opsiphanes glycerie*, Fabr. (figs. 4–6, larvæ and pupæ). Transformations described ; Dukinfield Jones, P. Liverp. Soc. xxxvi. pp. 33–35, pl. iii.

Satyridæ.

Marshall & De Nicéville, Butt. Ind. i. pt. 2, pp. 95–262, describe the *Satyrinæ* of India, &c., and figure the following known species :—*Zethera diademoides*, Moore, fig. 33 ; *Anadebis himachala*, Moore, fig. 35, pl. xiv. ; *Calites epiminthia*, Westw., pl. xiii. fig. 31; *Mycalesis anaxias*, Hew., fig. 54, *runeka*, Moore, fig. 56, *blasius*, Fabr., fig. 55, *perseus*, Fabr., var. *visala*, Moore, fig. 52, *oculus*, Marsh., fig. 53, *mnasicles*, Hew., fig. 51, and *junonia*, Butl., fig. 57, pl. xvi. ; *Neorina crishna*, Westw., pl. xiv. fig. 34 ; *Lethe mekara*, Moore, pl. xi. fig. 24, *dyrta*, Feld., fig. 22, *verma*, Koll., fig. 23, *maitrya*, De Nic., fig. 20 ; *Zophoessa jalaurida*, De Nic., fig. 19, *yama*, Moore, fig. 21, pl. x. ; *Neope pulaha*, Moore, fig. 25, *bhima*, Marsh., fig. 26, pl. xi. ; *Orinoma damaris*, Gray, pl. xiii., fig. 32; *Rhaphicera moorii*, Butl., fig. 38; *Amecera schakra*, Koll., pl. xv. figs. 45 & 46 ; *Hipparchia parisatis*, Koll., fig. 47, *lehana*, Moore, fig. 48; *Aulocera brahminus*, Blanch. (*veranga* on plate), fig. 49, pl. xvi. ; *Epinephele davendra*, Moore, fig. 39, *pulchella*, Feld., fig. 40 (left-hand), *pulchra*, Feld., fig. 40 (right-hand), *maiza*, Lang, fig. 41, pl. xv. ; *Iphthima avanta*, Moore (*ordinata* on plate), fig. 66, *nareda*, Koll., fig. 63, *hyagriva*, Moore, fig. 64, *huebneri*, Kirby, fig. 65, *sakra*, Moore, fig. 67, pl. xvii. ; *Ragadia crisilda*, Hew., pl. xv. fig. 36 ; *Erites angularis*, Moore, pl. xvi. fig. 50 ; *Œneis pumilus*, Feld., fig. 37 ; *Erebia shallada*, Lang, fig. 42, *mani*, De Nic., fig. 43 ; *Callerebia hybrida*, Butl. (*annada* on plate), fig. 44, pl. xv. ; *Zipœtes saitis*, Hew., fig. 58, *scylax*, Hew., fig. 62, pl. xvi. ; *Melanitis leda*, Linn., pl. i. (details), *aswa*, Moore, var. *tristis*, Feld., fig. 27, *ismene*, Cram., pl. i. (outline) and pl. xii. fig. 28, *zitenius*, Herbst, pl. xii. fig. 29 ; *Cyllogenes*

suradeva, Moore, pl. xiii. fig. 30; and *Parantirrhœa marshalli*, Wood-Mason (woodcut).

Erebia ligea and *euryale*, plumules, and *Œneis norna*, odour, noticed; Aurivillius, Ent. Tidskr. iv. pp. 33–36, 55 & 56.

Zethera aganippe, Feld., probably = *musa*, Feld., ♀; Butler, Ann. N. H. (5) xi. p. 409.

Neonympha canthus, Linn. Egg and different stages of larva described; W. H. Edwards, Canad. Ent. xv. pp. 64–69.

Erebia eriphyle, Freyer, and *melampus*, Fuessl., differentiated; Höfner, Wien. ent. Z. ii. pp. 191–193. He proposes (*l. c.*) to arrange the allied species in the following series:—*E. arete*, Fabr., *mnestra*, Hübn., *epiphron*, Knoch, *melampus*, Fuessl., *pharte*, Hübn., *eriphyle*, Freyer, and *manto*, Esp. *E. euryale-adyte*: hermaphrodite noticed; Frey, S. E. Z. xliv. pp. 373 & 374. *E. medusa*, Fabr., var. *hippomedusa*, Ochs. redescribed; Christ, JB. ges. Graub. xxvi. pp. 14 & 15.

Percnodaimon pluto, Fered. Variability in neuration; Fereday, Tr. N. Z. Inst. xv. p. 197, woodcuts, and N. Z. J. Sci. i. pp. 340 & 341.

Chionobas gigas, Butl., *iduna*, Edw., *californica*, Boisd., and *nevadensis*, Feld., are all one species; Möschler, S. E. Z. xliv. p. 155.

Arge galathea. Variety noticed; Benson, Ent. xvi. p. 210. White variety; Fallou, Ann. Soc. Ent. Fr. (6) iii. p. 22.

Satyrus janira varr. noticed; Walrond, Ent. xvi. p. 13, and Fallou, *l. c.* p. 22: ♂ pairing with *S. hyperanthus*, ♀; Paskell, Ent. xvi. p. 231. *S. tithonus*, varieties noticed; Buckell, Ent. xvi. p. 234.

Epinephile lycaon, Kühn, var. *lupinus*, Costa, noticed; Failla-Tedaldi, Nat. Sicil. ii. p. 249.

Pararge ida, Esp., ab. *albo-marginata* from S. France described; Fallou, *l. c.* p. 21, pl. i. No. ii. figs. *a* & *b*. *P. nasstrieddini*, Christoph, = *menava*, Moore; Christoph, Bull. Mosc. lvii. (2) p. 223.

Satyrus actæa, Esp., var. *mattozi* from the Serra da Estrella described; Monteiro, J. Sci. Lisb. ix. pp. 107–109.

Papilio polydecta, Cram., has been wrongly identified by Butler and Moore with varieties of *Mycalesis mineus*, Linn.; De Nicéville, P. E. Soc. 1883, pp. xxxvi. & xxxvii.

Mycalesis eusirus, Hopff., var. (?) from Abyssinia noticed; Oberthür, Ann. Mus. Genov. xviii. pp. 729 & 730.

Sevanda duponcheli, Guér., and its allies, *getulia*, Feld., and *dorycus*, Boisd., noticed; Butler, *l. c.* pp. 409 & 410.

Chortobius davus. Curious variety from Langstrothdale; Woodd & Porritt, Naturalist, ix. p. 53.

New species:—

Melanitis abdullæ, Distant, Ann. N. H. (5) xii. p. 241, Malay Peninsula.

Euptychia polla, fig. 12, *pytheus*, fig. 13, p. 319, *nausicaa*, fig. 14, and *lethra*, p. 320, Möschler, Verh. z.-b. Wien, xxxii. pl. xvii., Surinam.

Callerebia modesta, Moore, P. Z. S. 1883, p. 521, Gurwhal, N.W. Himalaya.

Pararge erebina, Butler, Ann. N. H. (5) xi. p. 278, Corea.

Mycalesis anaxioides, Upper Tenasserim, and *langi*, Sikkim, Mussoorie, Marshall & De Nicéville, Butt. Ind. i. pp. 107 & 130.

Erites falcipennis, iid. *l. c.* p. 237, Cachar.

Xois fulvida, Butler, *l. c.* p. 411, Fiji.

Iphthima multistriata, Formosa, and *granulosa*, Victoria Nyanza, *id. op. cit.* xii. pp. 50 & 101; *I. rara*, id. P. Z. S. 1883, p. 145, pl. xxiv. fig. 1, Mhow; *I. balanica*, Bolan Pass, and *tabella*, S. India, Marshall, Butt. Ind. i. pp. 231 & 234.

Elymniidæ.

Marshall & De Nicéville, Butt. Ind. i. pt. 2, pp. 263–279, describe the *Elymniinæ* of India, &c., and figure the following known species:—*Elymnias undularis*, Drury, fig. 59, *leucocyma*, Godt., fig. 60, and *Dyctis vasudeva*, Moore, fig. 61, pl. xvii.

Elymnias obnubila, Marshall, Butt. Ind. i. p. 272, Upper Tenasserim; *E. peali*, Wood-Mason, Ann. N. H. (5) xi. p. 62, Assam; *E. godferyi*, Distant, Ann. N. H. (5) xii. p. 351, Malay Peninsula; *E. dolorosa*, Butler, Ent. M. M. xx. p. 53, Nias: spp. nn.

Erycinidæ.

Distant (Rhop. Mal.) figures and redescribes the following known species:—*Zemeros albipunctata*, Butl., fig. 12, p. 187, *emesioides*, Feld., figs. 3 & 4, p. 188; *Abisara savitri*, Feld., fig. 5, *kausambi*, Feld., figs. 10 & 11 (anterior legs, fig. 47, p. 185), p. 189, *haquinus*, Fabr., fig. 13, p. 190, *thuisto*, Hew., woodcuts, figs. 51 & 52, p. 191, *tanita*, Hew., fig. 14, pl. xviii., *damajanti*, Feld., p. 192, and pupa of *Abisara prunosa*, woodcut, fig. 48, p. 186.

Mesene bomilcar, Stoll, noticed; *Nymphidium apame*, Hew., probably = *phyleus*, Cram.; *Stalactis evelina*, Butl., = *zephyritis*, Dalm., var.: Möschler, Verh. z.-b. Wien, xxxii. pp. 314 & 315.

Lemonias. W. H. Edwards, Butt. N. Am. ii. *Lem.* pl. i., figures and describes the transformations of his *L. nais* (figs. 1–4, *a–h*, h^2), and *palmeri* (figs. 5–8, *i*, *k*).

Charis zabua, Gosse, = *Lemonias tenellus*, Burm.; Gosse, Ent. xvi. p. 42, and Berg, Ann. Soc. Arg. xv. p. 151.

New species:—

Abisara abnormis, pl. xlix. fig. 3, Moulmein, British Burma, and *fraterna*, Bombay, Moore, P. Z. S. 1883, p. 532.

Cremna lucilia, Möschler, Verh. z.-b. Wien, xxxii. p. 312, pl. xv. fig. 9*a*, Surinam.

Euselasia lindana and *thusnelda*, id. *l. c.* p. 313, pl. xvii. figs. 10 & 11, Surinam.

Symmachia arbuscula, id. *l. c.* p. 314, Surinam.

LYCÆNIDÆ.

Polyommatus virgaureæ, Linn., *Lycæna orbitulus*, Esp., var. *dardanus*, Freyer, and *corydon*, var. *caucasica*, Led., noticed from North Caucasus; Alphéraky, Rev. mens. Ent. i. pp. 16 & 17.

Thecla læta and *alcestis*, Edw., *irioides*, Boisd., and *Lycæna pseudargiolus*, Boisd., var. *cinerea*, noticed from Arizona; W. H. Edwards, Papilio, iii. pp. 8 & 9.

Gerydus drumila, Moore, ♂ described by him; P. Z. S. 1883, p. 521.

Polyommatus helle, W. V., recorded from Norwegian Finmark; Sandberg, Ent. Tidskr. iv. pp. 131, 132, & 225. *P. phlæas*, Linn.: aberration described; Fromholz, B. E. Z. xxvii. pp. 239 & 240. *P. virgaureæ*, var. *estonica* from Esthonia described; Hoyningen-Heene, Ent. Nachr. ix. pp. 49–51. *P. xanthe*, Fabr.: pale variety noticed; Fallou, Ann. Soc. Ent. Fr. (6) iii. p. 22.

Lycæna argiolus, Linn., and varr. *parvipuncta*, Fuchs, and *hypoleuca*, Koll., and *semiargus*, Rott., aberr. *cæca*, Fuchs, discussed; Fuchs, S. E. Z. xliv. pp. 252 & 253. *L. ægon*, W. V., var. *killiasi* from Tarasp described; Christ, JB. Ges. Graub. xxvi. pp. 10 & 11. *L. ægonoides*, Burm., noticed; Butler, Ann. N. H. (5) xi. p. 111. *L. bætica*, Linn., noticed; A. H. Jones, Ent. xvi. p. 13. *L. baton* infested with larvæ of *Meloe*; Pérez & Brown, Act. Soc. L. Bord. xxxvi. p. xlvi. *L. corydon*: varieties noticed; South, Ent. xvi. p. 269: ♀ with blue hind-wings; Parsons, Ent. xvi. p. 261. *L. icarus*: hermaphrodite noticed; Weir, P. L. S. 1882–83, p. 5. *L. pseudargiolus*, Boisd.: its polymorphism, and the range, habits, times of appearance, &c., of its various forms: *lucia*, Kirby, *neglecta* and *violacea*, Edw., and *marginata* (n.), discussed; W. H. Edwards, Papilio, iii. pp. 85–97.

Zizera indica, Murr., and var. *decreta* noticed; Butler, P. Z. S. 1883, pp. 149 & 150.

Thecla rubi. Var. with yellowish-white spot on upper side of fore-wing; Geldart, Ent. xvi. p. 277.

Camena, Hew., recharacterized; besides *C. ctesia* (the type), *Hesperia cippus*, Fabr., likewise belongs to the genus: Moore, P. Z. S. 1883, pp. 529 & 530.

Sithon, Hübn., recharacterized, and *Papilio nedymond*, Cram., indicated as the type: *id. l. c.* p. 526.

Panchala paraganesa, Nicév. (= *ganesa*, Hew., *nec* Moore), redescribed; *id. l. c.* p. 530.

Ogyris genoveva, Hew. Transformations described and figured; the larvæ, as well as those of species of *Ialmenus*, are attended by ants: Miskin & Barnard, Tr. E. Soc. 1883, pp. 343–345.

New genera and species :—

Lehera, Moore, P. Z. S. 1883, p. 528 (= *Artipe*, Boisd., preoccupied). Type, *Papilio eryx*, Linn. (= *amyntor*, Herbst).

Vadebra, Moore, P. Z. S. 1883, p. 528. Intermediate between *Nadisepa* and *Rapala*. Type, *Deudorix petosiris*, Hew.; will also include *D. pheretima*, Hew., and *D. suffusa* and *lankana*, Moore.

Arrugia brachycera, Trimen, Tr. E. Soc. 1883, p. 353, Cape Colony.
Durbania saga, id. *l. c.* p. 354, Cape Colony.
Miletus corlisparsus, Butler, Ann. N. H. (5) xii. p. 159, Nias.
Spalgis nubilus, Moore, P. Z. S. 1883, p. 522, Andaman Isles.
Curetis gloriosa, fig. 1, Silhet, *angulata*, fig. 2, N.W. Himalaya, p. 522, and *arcuata*, fig. 3, Malabar, p. 523, *id. op. cit.* pl. xlviii.
Lycæna antinorii, Oberthür, Ann. Mus. Genov. xviii. p. 731, pl. ix. fig. 3, Abyssinia; *L. nodieri*, id. Bull. Soc. Ent. Fr. (6) iii. p. xii., Senegal; *L. leretti*, Butler, *l. c.* xi. p. 111, Corea; *L. lucida*, p. 348, *stellata*, p. 349, *puncticilia*, p. 350, and *bowkeri*, p. 351, Trimen, *l. c.*, S. Africa.
Castalius interruptus, Moore, *l. c.* p. 523, pl. xlviii. fig. 4, Bombay.
Cyaniris placida, fig. 5, Darjiling, *marginata*, fig. 6, Nepal, Darjiling, *latimargo*, fig. 9, N.E. Bengal, p. 523, *albidisca*, fig. 7, Nilgiris, *jynteana*, fig. 10, Khasia and Jyntea Hills, and *sikkima*, fig. 11, Darjiling, p. 524, *id. l. c.* pl. xlviii.
Catochrysops hapalina, Butler, P. Z. S. 1883, p. 148, pl. xxiv. figs. 2 & 3, Mhow; *C. vitiensis*, id. Ann. N. H. (5) xii. p. 389, Fiji Islands.
Zizera oriens, id. *op. cit.* xi. p. 417, Mindanao.
Chrysophanus snowi, W. H. Edwards, Tr. Kansas Ac. vii. [1881] p. 69, Colorado.
Thecla wittfeldi, id. Canad. Ent. xv. p. 136, Florida; *T. peralta*, fig. 1, p. 308, *heloisa*, fig. 2, *lorea*, fig. 3, p. 309, *fessa*, fig. 4, *bianca*, fig. 5, *aprica*, fig. 6, p. 310, *devia*, fig. 7, *thenca*, fig. 8, and *promissa*, fig. 9, p. 311, Möschler, Verh. z.-b. Wien, xxxii. pl. xvii., Surinam.
Niphanda plinioides, Moore, *l. c.* p. 524, pl. xlviii. fig. 8, Sikkim.
Horaga moulmeina (= *Myrina syrinx*, Hew., *nec* Feld.), Moulmein, *cingalensis* (= *ciniata*, Moore, *nec* Hew.), Ceylon, and *sikkima*, Darjiling, *id. l. c.* p. 525.
Aphnæus abnormis, id. *l. c.* p. 526, pl. xlix. fig. 4, Nilgiris; *A. bracteatus*, Butler, P. Z. S. 1883, p. 147, pl. xxiv. figs. 10 & 11, Mhow.
Ilerda langi, Moore, *l. c.* p. 526, Masuri.
Iolaus piaggiæ, Oberthür, Ann. Mus. Genov. xviii. p. 730, pl. ix. fig. 6, Abyssinia.
Hypolycæna cachara, fig. 6, Cachar Hills, *grotii*, fig. 5, N.E. Bengal, and *nilgirica*, fig. 8, Nilgiris, Moore, *l. c.* p. 527, pl. xlix.
Sithon indra, id. *l. c.* p. 527, Bengal.
Myrina inopinata, Butler, Ann. N. H. (5) xii. p. 159, Nias.
Tajuria jehana, Moore, *l. c.* p. 529, pl. xlix. fig. 7, Lucknow.
Pratapa lila, id. *ibid.* pl. xlix. fig. 9, Silhet.
Surendra biplagiata, Butler, P. Z. S. 1883, p. 147, pl. xxiv. fig. 12, Madras; *S. todara*, Moore, *l. c.* p. 530, Nilgiris.
Panchala birmana, id. *l. c.* p. 531, British Burmah.
Nilasera pirithous, N.E. Bengal, Assam, *opalina*, fig. 1, Khasia Hills, p. 531, and *subfasciata*, fig. 2, Burma, p. 532, *id. l. c.* pl. xlix.

HESPERIIDÆ.

PLÖTZ, C. Die Hesperiinen-Gattung *Hesperia*, Aut., und ihre Arten. S. E. Z. xliv. pp. 26–64 & 195–233.

Includes species numbered from 227–512. 162 species have been described as new; but upwards of 150 species described by other authors are unknown to the writer. *Hesperia*, as used by Plötz, includes the following:—Section A = *Goniloba*, groups 3 & 5, and *Cobalus*, as used by Herrich-Schäffer, Hübner's *Thracides*, *Phlebodes*, and *Carystus*, and part of his *Castnius*, *Astraptes*, *Epargyreus*, *Cœliades*, *Talides*, *Celænorrhinus*, *Colpodes*, *Augiades*, *Spioniades* and *Cobalus*. Section B = *Pamphila*, Fabr., and includes part of Hübner's *Cyclopides*, *Phemiades*, *Augiades*, and *Thymelicus*. The following is the most important synonymy given:—*H. praba*, Moore (= *phœnicis*, Hew.); *textor*, Hübn. (= *oneka*, Scudd., and *wakulla*, Edw.); *samoset*, Scudd. (= *alternata*, Grote & Rob.); *justinianus*, Latr. (= *almoda*, Hew.); *coscinia*, Herr.-Schäff. (= *brettus*, Herr.-Schäff.); *accius*, Sm. & Abb. (= *monoco*, Scudd., *nortoni*, Edw., and *punctella*, G. & R.); *panoquin*, Scudd. (= *ophis*, Edw.); *vestris*, Boisd. (= *osyka*, Edw.); *metacomet*, Harr. (= *kiowah*, Reak.); *cernes*, Boisd. & Lec. (= *origines*, Dru., and *thaumas*, Latr.); *ahaton*, Harr. (= *thaumas*, Fabr., and *cernes*, Edw.); *otho*, Sm. & Abb. (= *coras*, Latr.); *nemorum*, Boisd. (= *ridingsi*, Reak., and *napa*, *yreka*, *melana*, and *dacotah*, Edw.); *bimacula*, Grote & Rob. (= *acanootus*, Scudd.); *logan*, Edw. (= *delaware*, Edw.); *epictetus*, Fabr. (= *mys*, Hübn., ♀ *nec* ♂); *huebneri*, Möschl. (= *vitellius*, Hübn.); *arogos*, Boisd. & Lec. (= *cernes*, Edw.); *wingina*, Harr. (= *brettus*, Edw.); *phylæus*, Dru. (= *hela*, Butl.); *pechius*, Kirby (= *wamsutta*, Harr., and *coras*, Hew.); *pocahontas*, Scudd. (= *hobomok*, Harr., *quadaquina*, and *zabulon*, var., Scudd.); *zabulon*, Boisd. & Lec. (= *columbia*, pt., Scudd.); *sylvanoides*, Boisd. (= *columbia*, pt., Scudd.); *subhyalina*, Brem. & Grey (= *bouddha*, Mab.); *conspicua*, Edw. (= *pontiac*, Edw.); *venezuelæ*, Doubl. & Hew. (= *fractifascia*, Feld.); *augias*, Linn. (= *sagara*, Moore, *kreffti*, Mael., and *ancilla*, Herr.-Schäff.). Among the new species indicated, several appear to be identical with species described by Möschler under other genera; the separate entries are, however, recorded below.

——. Die Hesperiinen-Gattung *Phareas*, Westw., und ihre Arten. *L. c.* pp. 451–456.

18 species enumerated, 5 new. *Hesperia hemes*, Latr., = *neleus*, Linn., and *Papilio phereclus*, Linn., = *talaus*, Linn.

——. Die Hesperiinen-Gattung *Entheus*, Hübn., und ihre Arten. *L. c.* pp. 456–458.

6 species noticed, 1 new.

Pyrrhopyga palemon, Cram., pl. iv. fig. 11 (larva), and *Goniuris proteus*, Linn. Transformations described; E. D. Jones, P. Liverp. Soc. xxxvi. pp. 45–47.

Telegonus ophiuchus, Plötz, = *ramusis*, Cram.; Möschler, Verh. z.-b. Wien, xxxii. p. 322.

Erycides pygmalion, Cram. 5 species are confounded under this name in collections: *pygmalion*, Cram., *distans*, Herr.-Schäff., *pygmalion*, Hew. (renamed *hewitsonius*), and 2 new species; Mabille, C.R. ent. Belg. xxvii. pp. li. & lii.

Proteides ocrinus, Plötz, redescribed and figured; Möschler, Verh. z.-b. Wien, xxxii. p. 25, pl. xvii. fig. 15.

Hesperia comma. The various N. American forms allied to this species are discussed, but without the expression of any definite opinion as regards their specific claims. It is remarkable that European specimens more resemble the N. American than do the Asiatic. A few other N. American *Hesperiidæ* are also noticed. Speyer & W. H. Edwards, Canad. Ent. xv. pp. 141–151.

Pamphila linea. Transformations described; Buckler, Ent. M. M. xix. pp. 244–246. *P. pellucida*, Murray, var. *quinquepuncta* from Japan described; Mabille, *l. c.* p. lxiv.

Syrichthus alveus, Hübn., and *serratulæ*, Ramb., are hardly distinct; but *cacaliæ*, Ramb., appears to be so: Höfner, Wien. ent. Z. ii. p. 222.

Pyrgus (*Syrichthus*) *serratulæ*, Ramb., may possibly be the second brood of *alveus*, Hübn.; but this can only be decided by rearing: Fuchs, S. E. Z. xliv. pp. 253–256.

Thanaos tatius and *clitus* occur in Arizona; W. H. Edwards, Papilio, iii. p. 65.

Cecropterus, Herr.-Schäff., recharacterized; Mabille, *l. c.* p. lv.

New species:—

Erycides therinus, Bogota, and *valgus*, Cayenne, Mabille, C.R. ent. Belg. xxvii. pp. li. & lii.

Thymele nucula, Brazil, Cayenne, and *maneros*, Brazil, *id. l. c.* pp. lii. & liii.

Telegonus rotundatus, id. *l. c.* p. liii., S. America; *T. diophorus*, Möschler, Verh. z.-b. Wien, xxxii. p. 322, Surinam.

Eurypterus peruvianus, Mabille, *l. c.* p. liii., Peru.

Camptopleura ebenus, id. *ibid.*, locality not stated.

Cecropterus sulfureolus, Brazil, and *zonilis*, Colombia, *id. l. c.* pp. lv. & lvi.

Plesioneuru goto, Japan, *volux*, p. lvi., and *microthyrus*, Philippines, p. lvii., *id.* l. c.; *P. ochro-gutta*, Möschler, *l. c.* p. 330, pl. xvii. fig. 22, Surinam; *P. proserpina*, Butler, Ann. N. H. (5) xi. p. 424, Aru.

Ismene bilunata, id. *op. cit.* xii. p. 391, Fiji Islands.

Phareas ferruginea (Hopff., MS.), Bahia, p. 451, *cervinus*, locality unknown, *epimethea* (Prittw., MS.), Brazil, p. 452, *serenus* (Weym., MS.), locality unknown, and *annæ*, Parà, p. 455, Plötz, S. E. Z. xliv.

Entheus concinna (= *osiris*, Hopff., MS.), *id. l. c.* p. 458, Parà.

Pyrrhopyga sothis and *orbius*, Mabille, *l. c.* p. lvii., Brazil; *P. hephæstus*, Möschler, *l. c.* p. 324, Surinam.

Proteides volesus, Bogota, *philodamus*, Peru, p. lviii., *porius* and *orius*, S. America, p. lix., Mabille, l. c.; *P. osembo* and *monacha*, pl. xvii. fig. 16, Möschler, *l. c.* p. 326, Surinam.

Carystus duris, Philippines, *grandipuncta*, Parà, p. lix., *vallio*, New Holland, *lepte*, Parà, and *salenus*, Colombia, p. lx., Mabille, *l. c.*

Phlebodas (?) *sporus*, Mabille, *l. c.* p. lxi., locality not stated.

Cobalus obsoletus (Plötz, MS.), S. America, *atramentarius*, Cayenne, *nigritulus*, Panama, Brazil, *vetulus*, Brazil, *umbrosus*, p. lxii., *evanidus* and *venulus*, S. America, p. lxiii., *id. l. c.*

Hesperilla eaclis, id. *l. c.* p. lxiii., Australia.

Isotinen vindhiana, Jubbulpore, *nilgiriana*, p. 533, and *modesta*, Nilgiris, p. 534, Moore, P. Z. S. 1883.

Pamphila neophytes, Philippines, *aures*, E. Africa, p. lxiv., *lemur*, Cayenne, *indica*, India, p. lxv., *trisema*, Brazil, *impar*, Australia (?), p. lxvi., *antarctica*, Brazil, *monilis*, Punjab, p. lxvii, *californica*, California, *ludoviciæ*, Alps, Pyrenees, &c., p. lxviii., *dryops*, Brazil, Venezuela, p. lxix., *nicomedes*, Brazil, *rolla*, S. America, p. lxx., *pseudolus*, locality unknown, *akar*, Philippines, p. lxxi., *melanion*, Oceania, *hetærus*, Philippines, p. lxxii., *japonica*, Japan, *philænus*, Malaysia, p. lxxiii., *orfitus*, Java, and *phellus*, Malaysia, p. lxxiv., Mabille, l. c.; *P. parvipuncta*, fig. 17, *warra*, p. 327, *corisana*, *zeppa*, fig. 18, *ortygia*, *theogenis*, and *zola*, p. 328, Möschler, *l. c.* pl. xvii., Surinam; *P. carus*, Texas, and *milo*, Oregon, W. H. Edwards, Canad. Ent. xv. p. 34; *P. brettoides*, id. Papilio, iii. p. 71, Texas, Arizona.

Amblyscirtes cassus, id. *l. c.* p. 72, Arizona.

Apaustus servilius, *tiberius*, p. 329, *virginius*, fig. 20, and *alsimo*, fig. 21, p. 330, Möschler, *l. c.* pl. xvii., Surinam.

Thymelicus wallengreni, Trimen, Tr. E. Soc. 1883, p. 361, Natal, Zululand.

Hesperia warra, Surinam, *sabina*, New Freiburg, p. 27, *distigma* (Herr.-Schäff., MS.), p. 28, *discors* (Herr.-Schäff., MS.), locality unknown, *subornata* (= *ornata*, Feld.), Java, p. 32, *niveicornis* (Homeyer, MS.), Angola, *aquilina* (Prittw., MS.), locality unknown, p. 33, *dyma*, p. 34, *rezia*, *quadrangula* (Herr.-Schäff., MS.), Brazil, p. 35, *velleius* (Möschl., MS.), *corisana* (Möschl., MS.), Surinam, *norus* (= *maculata*, Edw.), New Orleans, p. 36, *olympia*, Brazil, *dicroca*, Rio Janeiro, p. 37, *dedecora*, La Guayra, *zeppa*, Surinam, *lydora*, Venezuela, *degener* (Herr.-Schäff., MS.), locality unknown, *ibara*, Madagascar, p. 38, *parvipuncta* (Herr.-Schäff., MS.), Surinam, *cyrus*, Rio Janeiro, p. 39, *favetta*, *gura*, Chiriqui, p. 41, *eteocla*, Rio Janeiro, p. 42, *pupillus* (Herr.-Schäff., MS.), locality unknown, *caffrariæ* (Herr.-Schäff., MS.), Caffraria, *autumna* (Weym., MS.), Central America, *neriena* (= *nero*, Herr.-Schäff.), locality unknown, p. 43, *holtzi*, Angola, *dalima*, Brazil, *intermedia* (Herr.-Schäff., MS.), Java, p. 44, *philerope* (= *corope*, Herr.-Schäff.), Brazil, *alice*, Philippines, p. 45, *ella*, *consanguis* (Herr.-Schäff., MS.), Java, *credula* (Herr.-Schäff., MS.), Brazil, *balarama*, Philippines, p. 46, *osca*, Caracas, *sabæa*, Brazil, *ulrica*, Rio Janeiro, p. 48, *xantho-sticta* (Hopff., MS.), p. 49, Parà, *verticalis* (Herr.-Schäff., MS.), *commodus*, Brazil, p. 50, *tyrtæus*, *edata*, p. 51, *phocylides*, p. 52, *lochius*, La Guayra, *dido*, Venezuela, p. 53, *judas*, New Freiburg, *grotii*, United States, p. 54, *pudorina* (Herr.-Schäff., MS.), Brazil, *lupulina* (Herr.-Schäff., MS.), p. 55, *lunata*, *silene*, locality unknown, *noctis* (Möschl., MS.), Chiriqui, *corticea* (Hopff., MS.), La Guayra, p. 56, *gereon*, Parà, p. 57, *vetulina* (Herr.-Schäff., MS.), locality unknown, *cinna*, United States, p. 58, *vesuria*, Jamaica, p. 63, *eulogius*, Mexico, *lidia* (Herr.-Schäff., MS.), locality unknown, p. 64, *aurinia* (Maassen, MS.),

Jamaica, p. 195, *gemma* (Weym., MS.), locality unknown, *floridensis*, Florida, *zenckii*, Mexico, p. 196, *amanda* (Herr.-Schäff., MS.), locality unknown, p. 197, *mutius*, Georgia, p. 199, *lysias*, Chiriqui, p. 200, *myrona*, Venezuela, *ammonia* (Herr.-Schäff., MS.), locality unknown, p. 201, *magica* (Herr.-Schäff., MS.), Cuba, *zela*, Montevideo, p. 202, *lujana*, Chili, *clara* (Herr.-Schaff., MS.), California, *morganta*, S. America, p. 203, *unna*, Philadelphia, p. 204, *ancora* (Herr.-Schäff., MS.), locality unknown, p. 205, *genoa*, Nevada, *ignorans*, locality unknown, p. 207, *dares* (Herr.-Schäff., MS.), locality unknown, *reticulata* (Herr.-Schäff., MS.), La Guayra, Chiriqui, p. 208, *lina*, Bogota, *zacharus*, Surinam, p. 209, *erratica*, Guatemala, p. 211, *angulina* (Hopff., MS.), Brazil, *ulphila*, Mexico, p. 212, *axius* (Weym., MS.), Colorado, *augustus*, Brazil, *subreticulata* (Herr.-Schäff., MS.), locality unknown, p. 213, *morrissoni*, Colorado, *grynea* (Herr.-Schäff., MS.), Chili, p. 215, *anatolica*, Asia Minor, p. 219, *francisca*, California, Mexico, *liberia* (Herr.-Schäff., MS.), locality unknown, p. 220, *amphissa* (Moritz, MS.), p. 221, *statius* (Herr.-Schäff., MS.), Venezuela, p. 223, *humeralis*, Parà, *macleayi* (Hopff., MS.), Amboina, Australia, p. 225, *ohara*, Cape York, p. 226, *argeus* (Weym., MS.), Cape York, p. 227, *chrysozona*, Philippines, *aliena* (Herr.-Schäff., MS.), Java, p. 228, *murcia* (Weym., MS.), locality unknown, p. 229, *letis*, Rio Janeiro, *euria* (Weym., MS.), locality unknown, *tropica*, p. 230, *serina*, Mexico, *ahrendti*, Amboina, *flavoguttata* (Hopff., MS.), Manila, p. 231, *nala*, India, *aleta* (Herr-Schäff., MS.), locality unknown, *coanza*, Angola, p. 232, *exilis* (Herr-Schäff., MS.), California, p. 233, Plötz, l. c.; *H. melangon*, S. America, *celiginea*, Brazil, Bogota, *giselus*, Bogota, p. lxxv., and *philippus*, Brazil, p. lxxvi., Mabille, *l. c.*

Pyrgus tucusa, Trimen, *l. c.* p. 359, Natal, Transvaal.

Pythonides contubernalis, Brazil, Guyana, and *assecla*, E. Brazil, Mabille, *l. c.* p. lxxvi.

Anisochoria sublimbata, id. *ibid.*, Colombia.

Thanaos inornatus, Butler, *l. c.* xi. p. 424, Aru.

Nisoniades australis, Mabille, *l. c.* pl. iv., Colombia; *N. phyllophila*, Trimen, *l. c.* p. 362, Natal, Delagoa Bay.

Anastrus subviolaceus, *stigmaticus*, Brazil, *varius*, Venezuela, p. liv., and *perfidus*, Brazil, Venezuela, p. lv., Mabille, *l. c.*

Leucochitonea nivella, id. *l. c.* p. lv., Bogota.

Achlyodes onorbo, Möschler, *l. c.* p. 331, pl. xvii. fig. 23, Surinam.

Pterygaspidea everyx, Mabille, *l. c.* p. lxxvii., Ceylon, Malacca.

Tagiades sem, Sanghir Islands, and *lugens*, Saigon, *id. l. c.* p. lxxviii.; *T. albo-vittata*, Moore, *l. c.* p. 534, Borneo.

Baoris scopulifera, Andamans, p. 532, *unicolor*, Darjiling, and *austeni*, Khasia Hills, Cherra Pungi, p. 533, *id. l. c.*

Baracus subditus, id. *l. c.* p. 534, Nilgiris.

Parnara canaraica, id. *ibid.*, Canara.

Sphingidæ.

Grote, A. R. The *Sphingidæ* of North America. Am. J. Sci. (3) xxv. pp. 210–214.

Includes a brief sketch of the gradual increase in our knowledge of the

N. American *Sphingidæ*, and discusses their probable origin. The 34 genera and 93 species are considered to be derived from three different sources, as follows:—(1) Descendants from a circumpolar fauna; 47 species, belonging to 10 genera. (2) Accessions from the tropics; 26 species, belonging to 11 genera. (3) Genera of N. American origin, peculiar to that continent; 20 species, belonging to 14 genera.

Schilde, J. Darwinistische Ungeheuer. Ent. Nachr. ix. pp. 225–232.

Discusses protective appearances in various *Sphinges* and their larvæ.

Druce, Biol. Centr. Am. *Lep. Het.* pl. iii. figs. 1–6, figures the following *Sphingidæ* apart from the text:—*Clanis imperialis*, *Chœrocampa godmani*, *Calliomma nobile*, *Amphionyx rivularis*, *Perigonia lusca* and *restituta*.

Waterhouse figures *Daphnis torrenia*, *Ambulyx argentata* and *elwesi*, Druce, *Macroglossa cynniris*, Guér., *Chœrocampa margarita*, Kirby, *Enyo excisa*, Walk., *Diludia bethia*, Kirby, *Triptogon rectilinea*, Moore, and *Aleuron butleri*, Kirby; Aid, ii. pls. cxxxvi. figs. 1–3, & cxl. figs. 1–6.

Dilophonota ello, Linn., *Argeus labruscæ*, Linn. (imago squeaks like a mouse), and *Pachylia inornata*, Clem. (pl. v. figs. 12–14, larvæ and pupa): transformations described; E. D. Jones, P. Liverp. Soc. xxxvi. pp. 47–51. *Philampelus vitis*, Linn., and *anchemolus*, Cram.: transformations noticed; *id. l. c.* xxxvii. pp. 244 & 245.

Macroglossa titan, Cram., mimicking *Trochilus*; Krause, Sci. Goss. xix. p. 139.

Berg, Anales, i.

Enyo lugubris, Linn. (= *fegeus*, Cram., and *luctuosus*, Boisd.), noticed; Möschler, Verh. z.-b. Wien, xxxii. p. 333.

Dilephila nicæa, var. *castissima* (Mill., MS.) from Algeria described; Austaut, Le Nat. v. p. 360.

Smerinthus ocellatus and *populi*: hybrids usually show traces of hermaphroditism, which seems to indicate that hermaphroditism is encouraged by hybridism, and that the usual sterility of hybrids may be due to this cause; Kirby, Evolution and Natural Theology, pp. 66 & 67. *S. austauti*, Staud., ab. *mirabilis* from Algeria described; Austaut, *l. c.* p. 359. *S. populeti*, Bienert, is very doubtfully distinct from *populi*, Linn.; Alphéraky, Rev. mens. Ent. i. pp. 17 & 18. *S. populi*: note on very young larva; Hellins, Ent. M. M. xix. p. 209.

Acherontia atropos trying to enter a beehive by daylight; Perkins, Ent. M. M. xix. p. 236. Odour; Hall, Ent. xvi. pp. 14 & 15.

Sphinx catalpæ, Boisd.: transformations figured; Am. Nat. xvii. p. 400. *S. ligustri*: case of retarded emergence; McRae & Argent, Ent. xvi. pp. 187 & 234. *S. lugens*, Walk. (= *eremitoides*, Walk.): transformations described; Snow, Tr. Kansas Soc. iv. [1875] pp. 28 & 29. *S. pinastri*: note on transformations; Sci. Goss. xix. p. 17.

Daremma hageni, Grote, occurs in Texas, not Kansas; Grote, Papilio, iii. p. 65.

Sorocaba, g. n., Moore, P. Liverp. Soc. xxxvi. p. 50. Allied to *Andriasa*, *Cressonia*, and *Pseudosmerinthus*. Type, *S. anomala*, sp. n., *ibid.*, pl. vi. fig. 15 (larva, which mimics that of a *Danais*), San Paulo, Brazil.

Chærocampa elicius, sp. n., Möschler, Verh. z.-b. Wien, xxxii. p. 332, pl. xviii. fig. 47, Surinam.

Smerinthus cablei, Von Reizenstein, Scribner's Monthly, xxii. pp. 864–866, fig. [1881], New Orleans; *S. bianchii*, Oberthür, Ann. Mus. Genov. xviii. p. 734, pl. ix. fig. 8, Abyssinia: spp. nn.

Sphinx baruta, sp. n., Berg, An. Soc. Arg. xv. p. 151, Buenos Aires.

Amphionyx tapayusa, sp. n., Moore, P. Liverp. Soc. xxxvii. p. 245 (transformations described; E. D. Jones, p. 246, larva figured, pl. vii. fig. 1), Brazil.

ÆGERIIDÆ.

Bembecia marginata, Harr., *Sesia acerni*, Clem., and *Melittia cucurbitæ*, Harr. Habits and transformations discussed; Hulst, Bull. Brooklyn Soc. vi. pp. 8–10.

In the *Cossidæ* and *Ægeriidæ*, ♂ pupæ have two rows of teeth on the tenth segment (not counting the head), and ♀ pupæ only one row; Lintner, P. Am. Ass. xxxi. pp. 470 & 471.

Ægeria. Druce, Biol. Centr. Am. *Lep. Het.* pl. v., figures *Æ. tryphoniformis*, fig. 3, *ruficaudis*, fig. 6, *producta*, fig. 7, *læta*, fig. 10, and *geliformis*, Walk., figs. 12 & 17. *Æ. acerni*: transformations noticed; Saunders, Canad. Ent. xv. p. 187. *Æ. hemizoniæ*, H. Edw.: larva destructive to raspberry; Rivers, Papilio, iii. p. 26.

Sesia arifrons, Zell., noticed; Jourdheuille, Cat. Lep. Digne, p. 223. *S. affinis*, Staud., and *chrysidiformis*, Esp., noticed fr. Ixxvi ng; Fuchs, S. E. Z. xliv. p. 256. *S. vespiformis*, Linn. (= *asiliformis*, Rott.), recorded as new to Sweden; Lampa, Ent. Tidskr. iv. pp. 60 & 116: redescribed; *id. l. c.* pp. 126 & 127. *S. phæniformis* (= *fæniformis*, Herr.-Schäff.) noticed; Failla-Tedaldi, Nat. Sicil. ii. p. 250. *S. syringæ*, Harr.: transformations described and figured; Hulst, Bull. Brooklyn Soc. v. p. 17, pl. 1, figs. 8 & 8*a–e*.

Trochilium apiforme, Cl.: the supposed hermaphrodite described and figured by Herman (Term. füzetek, v.; *cf.* Zool. Rec. xix. *Ins.* p. 184) is probably a ♂ with abnormal coloration on one side; Speyer, Ent. Nachr. ix. pp. 129–132. Heller replies to Speyer's remarks, and Speyer rejoins; *tom. cit.* pp. 197–199, 205 & 206. *T. bembeciforme*, Hübn.: aberration; Heylaerts, Tijdschr. Ent. xxvi. pp. cl. & cli.

Melittia gigantea, Moore, figured; Waterhouse, Aid. ii. pl. cxxxi. fig. 4. *M. pulchripes*, Walk, = *satyriniformis*, Hübn.; Druce, *l. c.* p. 32.

Tirista argentifrons, Walk., figured; *id. l. c.* pl. v. fig. 14.

Druce, *l. c.* pl. v. figs. 18–22, figures the following new species in advance of the text:—*Sincara phyllis, cambyses, lytæa, Sannina verrugo* and *korites*.

New species:—

Sesia flaviventris, Staudinger, S. E. Z. xliv. p. 177, Mecklenburg; *S. aurivillii*, Lampa, Ent. Tidskr. iv. p. 128 (fig., p. 129), Lapland.

Ægeria senta, fig. 1, Guatemala, *sallustiformis*, fig. 2, *deipyla*, fig. 8, Panama, p. 30, *guatemalena*, fig. 9, Guatemala, *tabogana*, fig. 16, Panama,

ceres, fig. 11, and *proserpina*, fig. 13, Guatemala, p. 31, Druce, Biol. Centr. Am. *Lep. Het.* pl. v.; *Æ. rufa*, Butler, Tr. E. Soc. 1883, p. 58, Valparaiso.

Sphecia championi, Druce, *l. c.* p. 29, pl. v. figs. 4 & 5, Guatemala.

Melittia butleri, id. *l. c.* p. 32, pl. v. fig. 15, Mexico.

Castniidæ.

Castnia. Druce, Biol. Centr. Am. *Lep. Het.* pp. 25–28, specially notices or figures *C. veraguana*, Westw., fig. 4, *casica*, Herr.-Schäff. (= *procera*, Boisd.), *atymnius*, Dalm. (= *spixi*, Perty, and *salasia*, Boisd.), *futilis*, Walk., fig. 5, pl. iv., *inca*, Herr.-Schäff. (= *clitarcha*, ♂, Westw.), *clitarcha*, Westw., pl. iii. fig. 7, *diva*, Butl. (= *tricolor*, Feld.), fig. 3, and *zagræa*, Feld., figs. 1 & 2, pl. iv.

Castnia mars, sp. n., Druce, P. Z. S. 1882, p. 778, pl. lx. fig. 2, Ecuador.

Agaristidæ.

Eusemia funebris, Moore, figured; Waterhouse, Aid, ii. pl. cxxvii. fig. 4.

Alypia octo-maculata, Fabr. Early appearance in 1883; Bull. Brooklyn Soc. vi. p. 24. *A. similis*, Stretch, var. *conjuncta* from California noticed; H. Edwards, Papilio, iii. p. 34. *A.* (?) *spadicea*, Feld. & Rog.: ♀ described; Berg, An. Soc. Arg. xv. p. 153.

Fenaria sevorsa, Grote, noticed by him, and referred to *Phægarista*; Canad. Ent. xv. p. 5.

Scudyra venosa, Moore, figured; Waterhouse, Aid, ii. pl. cxxxi. fig. 5.

Alypioides, g. n., Grote, Tr. Kansas Soc. viii. p. 46. Allied to *Alypia*; wings and body longer, body smoothly scaled, legs not piloso, vein 5 further from 4 than 3 at base. Type, *A. flavilinguis*, sp. n., *ibid.*, New Mexico.

Hecatesia falcata, sp. n., figured by Druce in advance of the text; Biol. Centr. Am. *Lep. Het.* pl. v. figs. 23 & 24.

Ægocera affinis and *tricolor*, spp. nn., Druce, Ent. M. M. xx. p. 155, E. Africa.

Alypia matuta (= *octo-maculata*, Sm. & Abb., *nec* Fabr.), Colorado, Missouri, Alabama, and *wittfeldi*, Indian River, Florida, spp. nn., H. Edwards, Papilio, iii. pp. 33 & 34.

Phægorista pallida, sp. n., Druce, Ent. M. M. xx. p. 156, E. Africa.

Chalcosiidæ.

Eterusia shahama, *Chalcosia nympha*, and *Chelura basiflava*, Moore, figured; Waterhouse, Aid, ii. pls. cxxvii. fig. 3, & cxxxi. figs. 2 & 3.

Milionia cyaneifera, Walk., ? = *glauca*, Cram.; *M. optima*, Walk., = *flammata*, Voll., = *requina*, Quoy: Butler, Ann. N. H. (5) xii. p. 108.

Phæochlæna tendinosa, Hübn. Transformations described; E. D. Jones, P. Liverp. Soc. xxxvi. pp. 51 & 52.

New species :—

Chalcosia œnone, Butler, Ent. M. M. xx. p. 57, Nias.
Amesia trepsichrois, id. *ibid.*, Nias.
Milionia drucii and *snelleni*, id. Ann. N. H. (5) xii. pp. 107 & 16[illegible] Celebes.
Epyrgis parvula, id. *l. c.* p. 160, Darjiling and Nicobars.
Isbarta lactea, id. *ibid.*, Java.
Pintia cyanea, id. *ibid.*, Sumatra.
Histia fraterna, Moore, P. Z. S. 1883, p. 15, Calcutta.
Anomœotes thymiathis, Druce, Ent. M. M. xx. p. 156, E. Africa.

Zygænidæ.

Zygæna exulans, Hoch.: natural history; Buckler, Ent. M. M. xx. pp. 150–154. *Z. loniceræ*, Esp., var. *eboraca* from York described; Prest, Ent. xvi. pp. 273 & 274, and P. E. Soc. 1883, p. xxviii. *Z. minos*, W. V., with five wings; Rogenhofer, SB. z.-b. Wien, xxxii. pp. 34 & 35, woodcut.

Procris globulariæ, Hübn. Natural history; Buckler, Ent. M. M. xx. pp. 97–103.

Ino ampelophaga, Bayle: larva described and figured, with imago; Millière, Ann. Soc. L. Lyon, xxix. pp. 169 & 170, pl. iii. figs. 7 & 8.

Syntomis phegea, Linn., ab. *nigricornis* from the Caucasus noticed; Alphéraky, Rev. mens. Ent. i. p. 18.

Naclia ancilla, Linn., is nearer allied to the *Lithosiidæ* than to the *Syntomidæ*, and sometimes comes to light; Höfner, Wien. ent. Z. ii. pp. 223 & 224.

Saurita cassandra, Linn.: transformations noticed; E. D. Jones, P. Liverp. Soc. xxxvii. pp. 246 & 247.

Eunomia eagrus uses its hairs to protect its pupa; F. Müller, Kosmos, xii. p. 449, fig., and Meldola, P. E. Soc. 1883, pp. xxiv. & xxv.

New species :—

Zygæna miltosa, Candèze, Feuill. Nat. iii. p. 47, La Rochelle (cf. *id.* C.R. ent. Belg. xxvii. p. xcii. pl. iv.B, where it is considered to be an entirely red aberration of *Z. hippocrepidis*, Hübn.).

Eupyra herodes, fig. 1, Ecuador, Sarayacu, *salmoni*, Colombia, and *cephalena*, fig. 2, Ecuador, Colombia, Druce, P. Z. S. 1883, p. 372, pl. xxxix.

Calonotos sandion, Colombia, Ecuador, and *flavicornis*, pl. xxxix. fig. 3, Colombia, p. 373, *id. l. c.*

Psoloptera meisteri, Berg, An. Soc. Arg. xv. p. 153, Buenos Aires.

Macrocneme thyra, Möschler, Verh. z.-b. Wien, xxxii. p. 334, pl. xviii. fig. 24, Surinam.

Isanthrene eusebia, p. 373, *thyestes*, pl. xxxix. fig. 4, and *tolosa*, p. 374, Druce, *l. c.*, Ecuador.

Homœocera ozora, fig. 6, Colombia, *buckleyi*, fig. 5, pl. xxxix. p. 374, and *lyrcea*, Ecuador, p. 375, *id. l. c.*

Erruca lycopolis, pl. xxxix. fig. 7, *phyleis* and *zephela*, Druce, *l. c.* p. 375, Ecuador.

Sphecosoma surrentum, pl. xxxix. fig. 8, Bolivia, and *ecuadora* [*-rum*], Ecuador, *id. l. c.* pp. 375 & 376.

Loxophlebia cumelis and *petosiris*, id. *l. c.* p. 376, Ecuador.

Gymnelia whitelii, E. Peru, and *torquatus*, Petropolis, *id. l. c.* pp. 376 & 377.

Cosmosoma omole, Ecuador, and *ufentina*, Bolivia, *id. l. c.* p. 377.

Dycladia felderi, fig. 9, p. 377, *vindonissa*, *cretheis*, and *chalonitis*, fig. 10, pl. xxxix. p. 378, *id. l. c.*, Ecuador.

Desmidocnemis asmodeus and *eumonides*, id. *l. c.* p. 378, Ecuador.

Eunomia ocina, id. *l. c.* p. 379, pl. xxxix. fig. 11, Bolivia.

Argyroides boliviana, id. *ibid.* pl. xxxix. fig. 12, Bolivia.

Pezaptera carmania, id. *l. c.* p. 379, Ecuador.

Trichura hadassa, id. *ibid.*, Ecuador.

Chloropsinus viridis, id. *l. c.* p. 380, Ecuador.

Illipula ornata, id. *ibid.*, Ecuador.

ARCTIIDÆ.

The following known species are redescribed and figured by Moore, Lep. Ceyl. ii. pl. cviii.:—*Creatonotus interruptus*, Linn. (= *francisca*, Fabr.), figs. 5 & 5*a*, *continuatus*, fig. 4, p. 73, *emittens*, Walk., figs. 3 & 3*a*; *Aloa sanguinolenta*, Fabr., figs. 6 & 6*a*, p. 74; *Areas melanopsis*, Walk, (= *Aloa callisoma*, Feld.), fig. 2, p. 75; *Rhodogastria astræa*, Drury (= *melanthus*, Cram.), figs. 1 & 1*a* (with larva and pupa), p. 76; and *Cycnia sparsisignata*, Walk., p. 77.

Ctenucha rubriceps, Walk. (= *opaca*, Boisd.), and *vittigera*, Blanch. (? = *nivosa*, Walk.), noticed; Berg, An. Soc. Arg. xvi. p. 270.

Daritis sacrifica, Geyer, and *Motada lateralis*, Walk. Transformations described; E. D. Jones, P. Liverp. Soc. xxxvi. pp. 12 & 13.

Glaucus tricolor and *Pangora matherana*, Moore, figured; Waterhouse, Aid, ii. pl. cxxxi. figs. 1 & 6.

Callimorpha hera, Linn., ab. *lutescens*, Staud., and *Arctia aulica*, Linn., and var. *maculata*, Lang, noticed; Fuchs, S. E. Z. xliv. pp. 258–260.

Leucarctia acræa and *Pyrrharctia isabella*, Smith. Abdominal appendages (scent-organs) of ♂; Weed, Papilio, iii. pp. 41, 42, & 84.

Arctia caia: stridulation; Swinton, Ent. M. M. xx. p. 83: aberration described; Fallou, Ann. Soc. Ent. Fr. (6) iii. pp. 21 & 22. *A. nais*, Dru.: the following appear to be varieties: *phalerata*, Harr., *pallida*, Streck., *celia*, Saund., *snowi*, Grote, *phyllira* and *figurata*, Dru., *placentia*, Abb. & Sm., *decorata*, Saund., *flammea* and *excelsa*, Neum.; *A. parthenice*, Kirby, *A. saundersi* and *anna*, Grote, are varieties: Hulst, Bull. Brooklyn Soc. vi. pp. 69–71. *A. incorrupta*, H. Edw., ♀ and var. *ochracea* described; Neumoegen, Papilio, iii. p. 71. *A. villica*, Linn., noticed; Failla-Tedaldi, Nat. Sicil. ii. p. 250. *A. virgo*, Linn.: fertile eggs obtained from a dead specimen; Schaupp, Bull. Brooklyn Soc. v. p. 81.

Chelonia plantaginis, Linn. On rearing; Ricketts, Ent. xvi. p. 113.

Antarctia severa, Berg, and *vulpina* var. *b*, Burm., = *brunnea*, Hübn.; Berg, An. Soc. Arg. xv. pp. 154 & 155.

Palustra burmeisteri, Berg. Pupation, oviposition, &c.; *id.* S. E. Z. xliv. pp. 402–404, and An. Soc. Arg. xv. p. 280.

Nemeophila russula, Linn. Aberration described; Fromholz, B. E. Z. xxvii. p. 240.

Callimorpha dominula, Linn., var. figured; Ent. xvi. p. 1. *C. jacobææ*, Linn.: black variety noticed; Perkins, Ent. M. M. xix. p. 236.

Spilosoma. Supposed hybrid larvæ between *S. luctuosa*, Hübn., and *mendica*, Clerck, noticed; Viertl, SB. z.-b. Wien, xxxiii. p. 16. *S. congrua*, Walk., noticed; Grote, Canad. Ent. xv. p. 9. *S. menthastri*, Linn., ab. *walkeri*, Curt., redescribed; Höfner, Wien. ent. Z. ii. p. 245. *S. zatima*, Cram., var. *deschangii* described; Depuiset, Bull. Soc. Ent. Fr. (6) iii. p. lxxviii.

Hyphantria textor, Harr., and *cunea*, Dru., differ both in larva and imago; Coleman, Papilio, iii. p. 26. Early appearance of the latter; Davis, Papilio, iii. p. 84.

Ecpantheria. Burmeister publishes a revision of this genus, admitting 20 species (1 new), and giving the following synonymy (An. Mus. B. Aires, iii. pp. 19–44):—*E. scribonia*, Hübn. (= *oculatissima*, Abb. & Sm., and *ocularia*, Fabr.), *columbina*, Oberth. (= *distans*, Oberth.), *extrema*, Walk. (= *mexicana* and *detectiva*, Oberth.), *aulæa*, Geyer (= *incarnata*, Walk., and *picta*, Pack.), *decora*, Walk. (= *haitensis*, Oberth.), *simplex*, Walk. (= *guadulpensis*, Oberth.), *lantanæ*, Fabr. (= *eridane*, Hübn., *nec* Cram., and *obliterata*, Walk.), *cunigunda*, Cram. (= *cayennensis*, Oberth., with varr. *ganglo*, *proxima*, *annexa*, *decipiens*, *bari*, *dubiosa*, and *orbiculata*, Oberth., and *orsa*, Cram.), *xanthonota*, Oberth. (= *garzoni*, *bolivar*, *muzina*, *albicollis*, *thimii*, *abscondens*, and *depauperata*, Oberth.), *kinkelini*, Burm. (= *aramis*, Oberth.), *indecisa*, Walk. (= *bonaerensis*, Boisd., MS., and *detecta*, Oberth.), *læta*, Walk. (= *brasiliensis*, Oberth.), and *præclara*, Oberth. (= *magdalenæ*, Oberth.).

Ecpantheria scribonia, Stoll, described and figured, with larva; Saunders, Rep. E. Soc. Ont. 1882, pp. 14 & 15, figs. 4 & 5*a*, *b*.

New genera and species:—

Pryteria, Möschler, Verh. z.-b. Wien, xxxii. p. 335. Allied to *Eucyrta* (*Automolis*, Hübn.), but with costal nervure. Type, *P. costata*, sp. n., *l. c.* p. 336, pl. xviii. fig. 27.

Pygoctenucha, Grote, Tr. Kansas Soc. viii. p. 46. Allied to *Ctenucha*; wings entire, narrower, eyes naked, front smooth, abdomen tufted, especially in ♀; labial palpi rather slender, a little exceeding the front, antennæ ♂ ciliate, subpectinate; ♀ serrate, each projection with a single terminal seta. Type, *C. harrisi*, Harr.; add *P. funerea*, sp. n., *ibid.*, New Mexico.

Alexicles, id. ibid. *Arctiidæ* (?); head rather produced, eyes hairy, palpi small, concealed by the thick clypeal vestiture, abdomen short, antennæ of ♂ pectinate, wings rather long and narrow, entire, subdiaphanous, cell of fore-wings closed, veins 3–5 rising near together. Type, *A. aspersa*, sp. n., *l. c.* p. 47, New Mexico.

...ug]. Aires, iii. p. 42. Type, *Ecpantheria* ...*ytii* and ...*bahiensis*, and *boisduvali*, Oberth., are ...466]. ..., may be a var. of the ♂).

...Colombia, Bogota, *imperialis*, fig. 2, Ecuador, p. 3... *Automeris* sp. (da... u, *buckleyi*, fig. 4, *bertha*, fig. 1, pl. xl., *perilla* and *chloe*, E... *pa sabina* p. 381, Druce, P. Z. S. 1883.

Diabæna imitata, id. *l. c.* p. 382, Ecuador.

Automolis superba and *asara*, id. *ibid.* pl. xl. figs. 8 & 7, Ecuador.

Androcharta cassotis, id. *ibid.* pl. xl. fig. 11, Ecuador.

Ecius polyxenus, id. *l. c.* p. 383, pl. xl. fig. 6, Ecuador.

Arctia excelsa, Neumoegen, Papilio, iii. p. 70, N. Carolina.

Chelonia bieti, C. Oberthür, Bull. Soc. Ent. Fr. (6) iii. p. xliii., Thibet; *C. geometrica*, id. Ann. Mus. Genov. xviii. p. 735, pl. ix. fig. 7, Abyssinia.

Aloa marginata, Moore, P. Z. S. 1883, p. 15, pl. v. fig. 1, Nepal.

Zatrephes chaon, fig. 10, *grandis*, fig. 5, and *buckleyi*, fig. 9, Druce, P. Z. S. 1883, p. 383, pl. xl., Ecuador.

Vanessodes fuscipes, Grote, Canad. Ent. xv. p. 86, Arizona.

Hypercompa tigris, Butler, Ann. N. H. (5) xii. p. 106, Victoria Nyanza.

Aletis monteironis, Druce, Ent. M. M. xx. p. 156, E. Africa.

Hoplarctia claria, id. P. Z. S. 1883, p. 383, Ecuador.

Halisidota ochracea, Möschler, Verh. z.-b. Wien, xxxii. p. 337, pl. xviii. fig. 28, Surinam.

Ecpantheria anomala, Burmeister, An. Mus. B. Aires, iii. p. 41, figs., Entre-Rios.

Lithosiidæ.

Melanchria, *Atyria*, *Phœochlæna*, Hübn., *Campylona*, Möschl., *Milionia* and *Sangala*, Walk., and various other genera described by Walker, &c., under the *Lithosiidæ* and *Arctiidæ*, should be transferred to the *Geometridæ*; Möschler, Verh. z.-b. Wien, xxxii. pp. 334 & 335.

Nola cicatricalis, Treitschke, and var. *confusalis*, Herr.-Schäff., and *Lithosia caniola*, Hübn., noticed; Fuchs, S. E. Z. xliv. pp. 257 & 258.

Iosia modesta, sp. n., Möschler, Verh. z.-b. Wien, xxxii. p. 334, pl. xviii. fig. 25, Surinam.

Hypocrita flavo-fasciata, sp. n., *id. ibid.* fig. 26, Surinam.

Bizone rubrifasciata, sp. n., Druce, Ent. M. M. xx. p. 156, N. Celebes.

Hypsidæ.

Damalis concana, sp. n., Moore, P. Z. S. 1878, p. 4 [omitted from Zool. Rec. xv.], and Waterhouse, Aid, ii. pl. cxxxii. fig. 7, Canara.

Nycteolidæ.

Hylophila prasinana, Linn., var. *millierii* from France and Belgium described; Capronnier, C.R. ent. Belg xxvii. p. xcix.

LEPID[illegible]*nina* var. *b*, Burm., = *brunnea*, Hübn.;

NYCTEME[illegible]ion, oviposition, &c.; *id.* S. E. Z. p. 280.

Nyctemera annulata, Boisd. Transformati[illegible]scribed; Fromholz, B. E. Z. xvi. pp. 39 & 40.

Nyctemera fulleri, sp. n., Druce, Ent. M. M. xx. p. 1[illegible]ri. p. 1. Gs.

Leptosoma melaneura, sp. n., Butler, Ann. N. H. (5) xii. p[illegible], Nias.

CALLIDULIDÆ.

Cleosiris fasciata, Borneo, and *major*, N. India, spp. nn., Moore, P. Z. S. 1883, p. 15.

LIPARIDÆ.

The following known species are redescribed and figured by Moore, Lep. Ceyl. ii.:—*Orgyia postica*, Walk., figs. 1, 1*a*, & 1*b* (transformations), *ceylonica*, Nietn., p. 78, *viridescens*, Walk.; *Enome ampla*, Walk., figs. 2, 2*a*, & 2*b*, pl. cix. (transformations), p. 79; *Antipha antica*, Walk. (= *Anaxila notata*, Walk.), fig. 3, p. 80, *costalis*, Walk. (= *Lacida complens* and *Rilia illepida*, Walk.), figs. 2, 2*a*, & 2*b* (transformations), *strigulifera* and *promittens*, Walk., p. 81; *Charnidas rotundata*, Walk. (= *Cycnia rubida* and *Lymantria disjuncta*, Walk.), figs. 4 & 4*a*, *plana*, Walk. (= *junctifera*, Walk.), figs. 1 & 1*a*, p. 82, *subnotata*, Walk.; *Lælia anguliferа*, Walk. (= *Ricine suffusa*, Walk.), figs. 5 & 5*a*, pl. cx. p. 83; *Artaxa digramma*, Boisd. (= *guttata*, Walk.), pl. cxii. figs. 1 & 1*a*, *apicalis*, Walk., pl. cxi. figs. 4, 4*a*, & 4*b* (transformations), *citrina*, Moore, figs. 2 & 2*a*, p. 85, *cervina*, Moore, fig. 3, *pusilla*, Moore (= *Euproctis pygmæa*, Moore, *olim.*), fig. 4, pl. cxii.; *Somena scintillans*, Walk., figs. 3 & 3*a* (transformations), p. 86, *subnotata*, Walk., figs. 1, 1*a*, & 1*b* (transformations), p. 87; *Bembina apicalis*, Walk., fig. 55, pl. cxi. p. 88; *Porthesia subdita*, Moore, figs. 5 & 5*a*; *Euproctis bimaculata*, Walk., figs. 6 & 6*b*, p. 89, *bigutta*, Walk., fig. 6*a*, pl. cxii., *lutescens*, fig. 1, *tinctifera*, Walk., p. 90; *Chærotricha decussata*, Moore, figs. 2, 2*a*, & 2*b* (transformations); *Cispia punctifascia*, Walk., fig. 3, p. 91; *Redoa submarginata*, Walk., fig. 4, pl. cxiii. p. 92; *Perina nuda*, Fabr. (= *P. basalis*, Walk., *Euproctis antica* var. *c*, *E. combinata*, and *Stilpnotia subtincta*, Walk.), pl. cxiv. figs. 1, 1*a*, & 1*b* (transformations), p. 94; *Psalis securis*, Hübn. (= *Arestha antica*, *Rigema falcata*, and *Anticyra approximata*, Walk.), figs. 1, 1*a*, & 1*b* (transformations), p. 95; *Olene mendosa*, Hübn. (= *Rilia lanceolata*, Walk.), figs. 4, 4*a*, & 4*b* (transformations), p. 96, *fusiformis*, Walk., fig. 3, *basivitta*, Walk. (? = *Nioda transversa*, Walk.), fig. 2, pl. cxv. p. 97; *Caltura alba*, Moore, pl. cxiv. figs. 2, 2*a*, & 2*b* (transformations), p. 98; *Lymantria grandis*, Walk. (= *maculosa* and *metarhoda*, Walk.), p. 99, *obsoleta*, Walk. (= *lunulata*, var. *β*, Walk., and *bhascara*, Moore); and *Trichia exigua*, Nietr., p. 100.

Orgyia badia, H. Edw.: transformations described; the species is scarcely distinct from *O. antiqua*, Linn.: Stretch, Papilio, iii. pp. 38 & 39. *O. josephina*, Aust.: larva described and figured; Millière, Ann. Soc. L. Lyon, xxix. p. 171, pl. iii. fig. 12. *O. leucostigma*, Smith & Abb.: trans-

…*ugis*, noticed; Clarkson & Saunders, …*ygii* and …466]. …6. *O. pudibunda*, Linn.: hermaphro- …135.

…Linn. Aberration noticed; Heylaerts, Tijdschr. Ent. …*Automeris* sp. (de…

Euproc…*oppa sabina*…, Snell., = *flavata*, Cram., ♂; Snellen & Piepers, Tijdschr. Ent. xxvi. p. cxxxiv.

Anaphe panda, Boisd. Nest, habits, larva, pupa, and a Lepidopterous parasite, described and figured; Fromholz, B. E. Z. xxvii. pp. 9–14, pl. ii.

New genera and species :—

Lælioides, Moore, Lep. Ceyl. ii. p. 83. Allied to *Lælia*. Type, *L. fasciata*, sp. n., *l. c.* p. 84, pl. cx. fig. 6, Ceylon.

Kanchia, id. *l. c.* p. 92. Placed after *Redoa*. Type, *Leucoma subvitrea*, Walk. (redescribed and figured; *l. c.* p. 93, pl. cxiii. fig. 5).

Thagona, Möschler, Verh. z.-b. Wien. xxxii. p. 337. Affinities not stated. Type, *T. uniformis*, sp. n., *l. c.* p. 338, Paramaribo.

Phiditia, id. *l. c.* p. 338. Affinities uncertain; perhaps belongs to the *Geometridæ*. Type, *Phalæna diores*, Cram.

Artaxa fraterna, Moore, Lep. Ceyl. ii. p. 85, Ceylon.

Somena irrorata, id. *l. c.* p. 87, pl. cxi. fig. 2, Ceylon.

Dasychira thwaitesi, id. *l. c.* p. 98, pl. cxvi. figs. 1 & 1*a*, *b* (transformations), Ceylon.

Lymantria fuliginosa, id. P. Z. S. 1883, p. 17, Bombay.

Trisuloides catocalina, id. *ibid.*, Darjiling.

Thaumatopæa cheela, id. *l. c.* p. 18, pl. v. figs. 3 & 3*a*, Umballa.

Psychidæ.

Moore, Lep. Ceyl. ii. pl. cxviii., figures and redescribes *Eumeta crameri*, Westw. (= *Cryptothelea consorta*, Walk., and *Eumeta nietneri*, Feld.), figs. 1 & 1*a*, p. 102, *Manatha albipes*, Moore, figs. 4 & 4*a*, *Metisa plana*, Walk., fig. 9, p. 105, and *Chalia doubledayi*, Westw., figs. 5 & 5*a*, p. 106.

Millière cautions entomologists about the ease with which rare species of *Psychidæ* may be exterminated; Nat. Sicil. iii. pp. 35 & 36.

Description of a Psychid pupa found on cocoa-palm at Rio de Janeiro; Letzner, JB. schles. Ges. lx. pp. 308 & 309.

Acousmaticus magnicornis, Butler, figured; Waterhouse, Aid, ii. pl. cxxxii. fig. 3.

Psyche sp. from Brazil: transformations noticed; E. D. Jones, P. Liverp. Soc. xxxvii. pp. 249–251. *P. helicinella*, Herr.-Schäff., noticed from Algeria; Heylaerts, C.R. ent. Belg. xxvii. p. xciii. *P. heylaertsi*, Mill.: larva noticed; Failla-Tedaldi, Nat. Sicil. ii. p. 250.

Fumea. Doubtful species from Carinthia noticed; Höfner, Wien. ent. …ii. pp. 245 & 246.

Trichopsyche hirsutella, Hübn., noticed as new to Sweden; Rudolphi, Ent. Tidskr. iv. pp. 37 & 56.

Eumeta layardi, Moore (= *crameri*, Walk., *nec* Westw.), Lep. Ceyl. ii. p. 102, pl. cxviii. figs. 2 & 2*a*, Ceylon.

LEPIDOPTERA.

Epichnopteryx proxima, Led. (new [illegible] 5. Etion, oviposition, &c.; *id.* S. E. Z. Curó, Bull. Ent. Ital. xv. p. 296. *E. p.* [illegible] p. 280. described; Heylaerts, *l. c.* p. xlviii. [illegible] scribed; Fromholz, B. E. [illegible]

Acanthopsyche tedaldii, Heylaerts, redescribed

Thyridopteryx ephemeriformis, Steph. Transforma[illegible], enemies, &c., described; Lintner, Rep. Ins. N. York, i. pp. [illegible] fig. 13. It oviposits within the puparium; Clarkson, Canad. Ent. xv. pp. 98 & 99. Young larva described; H. Edwards, Papilio, iii. p. 24.

Œcinia scotti, Scott, noticed; Macleay, P. Linn. Soc. N. S. W. viii. p. 197, and N. Z. J. Sci. i. p. 425.

Perophora sanguinolenta, Feld., "Hammock Moth," xxxiii. [1879] pp. lxxvii. & lxxxi., plate (cases), and *albistriga*, Walk., xxxvi. pp. 53 & 54. Transformations described; E. D. Jones, *l. c.*

New genera and species:—

Bambalina, Moore, Lep. Ceyl. ii. p. 103. Allied to *Eumeta*. Type, *Œceticus* (*Cryptothelea*) *consorta*, Templ., redescribed and figured, with case, *ibid.* pl. cxviii. figs. 3 & 3*a*.

Dappula, id. *ibid.* Type, *Œceticus tertius*, Templ. (= *Œ. templetoni*, Westw.), redescribed and figured, *l. c.* p. 104, pl. cxviii. figs. 6 & 6*a*.

Aprata, id. *l. c.* p. 106. Placed after *Chalia*. To include *A. thwaitesi* and *mackwoodi* (type), spp. nn., *l. c.* p. 107, pl. cxviii. figs. 7 [illegible] 7*a*, & 8, Ceylon.

Bijugis alpherakii, Heylaerts, C.R. ent. Belg. xxvii., Kulja.

Acanthopsyche oberthueri, id. *l. c.* p. xciii, Algeria.

Perophora externa, Moore, P. Liverp. Soc., xxxvi. p. 54, San Paulo, Brazil.

Notodontidæ.

Moore, Lep. Ceyl. ii., divide of the larva: 1, *Dicranurinæ* (larva with fourteen legs), p. 107; and 3, *Careinæ* (larva with sixteen legs, anteriorly), p. 110; [illegible] include *Carea*, *Dabarita*, and *Brada*, Walk.), p. 116. ments tumid; to [illegible]es and redescribes the following species of Walker:—

Moore, *l. c.*, figs. pl. cxix. figs. 1 & 1*a*, *b*, p. 109, *Metria viridescens*, *Stauropus altern* 2*a*, p. 110, *Ceira metaphæa*, pl. cxix. fig. 3, *Notodonta* pl. cxx. figs. 2; *etta apicalis*, pl. cxxi. figs. 2 & 2*a*, p. 114, *Ichthyura res-* *Carea* [illegible]*pes* (= *Chora curvifera* and *Dabarita rhodophila*), figs. 1 & 1*a*, p. 116, *Dabarita subtilis*, figs. 3 & 3*a*, pl. cxxiii. p. 117, and *Brada truncata* (= *Phanaca damnipennis*), pl. cxxii. figs. 2 & 2*a*, *b*, p. 118.

Cerura vinula. The so-called glandular sac of the larva can hardly be considered a true gland, from the large quantity of chitinous matter constituting the wall of the sac itself; Hammond, P. L. S. 1880–82, p. 7. Excrements, and diseases of larvæ; Dymes & Finch, Sci. Goss. xix. pp. 93, 119, 142, 143, & 190.

Stauropus fayi. On breeding; Jobson, Ent. xvi. pp. 211 & 212.

...*uginosa*, Moore, figured; Waterhouse, ...*egii* and *cuculla*, Esp., noticed; Fuchs, S. E. Z. ...466].

Automeris sp. (des- ...Moore, figured; Waterhouse, Aid, ii. pl. cxxxii. fig. 6. ...*lippa sabina*.

Petas... ...*osa*. Natural history; Buckler, Ent. M. M. xix. pp. 271–274 (*cf.* also Porritt, Ent. xvi. p. 46).

Asteroscopus nubeculosus. A ♂ pairing with two ♀♀, from both of which fertile eggs were obtained; Borgmann, Ent. Nachr. ix. pp. 114–116.

Cnethocampa. File of processionary caterpillars at Toulon more than thirteen feet long; when the leader was interfered with, the column became disordered: Feuill. Nat. iii. p. 61.

Gastrocampa pinivora, *processionea*, and *pityocampa*. Structure of the stinging hairs of the larvæ described; Keller, Kosmos, xiii. pp. 302–306, fig.

Clostera inclusa, Hübn. Young larva described; H. Edwards, Papilio, iii. p. 24.

Streblota, Hübn., pt., Berg, and *Stimulea*, Clem., = *Sibine*, Herr.-Schäff. and is correctly referred by Berg to the *Notodontidæ*; Möschler, Verh. z.-b. Wien, xxxii. pp. 352 & 353.

Aneurocampa lateralis, Walk., xxxvi. p. 55, pl. vi. fig. 16, and *mingens*, Herr.-Schäff., xxxvii. pp. 247–249, pl. vii. fig. 2 (larva). Transformations described; E. D. Jones, P. Liverp. Soc.

Corma, Moore, preoccupied, renamed by him *Ambadra*; P. Z. S. 1883, p. 16.

New genera and species:—

Baradesa, Moore, P. Z. S. 1883, p. 16. Placed after *Ambadra*. Type, *B. lithosioides*, sp. n., *l. c.* p. 17, pl. v. fig. 2, Darjiling.

Strophocerus, Möschler, Verh. z.-b. Wien, xxxii. p. 344. Affinities not stated. Type, *S. flocciferus*, sp. n., *l. c.* p. 345, pl. xviii. fig. 33, Surinam.

Talmenia, id. *l. c.* p. 345. Affinities not stated. Type, *T. arsilonchoides*, sp. n., *l. c.* p. 346, pl. xviii. fig. 34, Paramaribo.

Antiora, id. *l. c.* p. 346. Affinities not stated. Type, *A. contingata*, sp. n., *l. c.* p. 347, pl. xviii. fig. 35, Surinam.

Lysana, id. *l. c.* p. 347. Allied to *Edema*. Type, *L. plexa*, sp. n., *l. c.* p. 348, pl. xviii. fig. 36, Surinam.

Dorisia, id. *l. c.* p. 351. *Notodontidæ*; affinities doubtful. Type, *Phalæna verago*, Cram.

Harpyia kandyia, Moore, Lep. Ceyl. ii. p. 108, pl. cxx. figs. 1 & 1*a*, Ceylon.

Antheua exanthemata, id. *l. c.* p. 111, pl. civ. fig. 2, Ceylon.

Pheosa (?) *basalis*, id. *l. c.* p. 113, pl. cxxi. figs. 1 & 1*a*, Ceylon.

Heterocampa stragula and *muscosa*, Möschler, Verh. z.-b. Wien, xxxii. p. 342 & 343, pl. xviii. figs. 30 & 31, Surinam.

Nystalea divisa, id. *l. c.* p. 343, pl. xviii. fig. 32, Surinam.

Lepasta mixta, id. *l. c.* p. 349, pl. xviii. fig. 37, Surinam.

Chliara raatzi and *notha*, pl. xviii. fig. 38, *id. l. c.* p. 350, Surinam.

Sibine affinis, id. *l. c.* p. 353, Surinam.

var. *b*, Burm., = *brunnea*, Hübn.;

LIMACODIDÆ.

oviposition, &c.; *id.* S. E. Z.

Moore, Lep. Ceyl. ii., redescribes and [illegible]
(= *Limacodes graciosa*, Westw.), pl. cxxviii. fig. [illegible]; Fromholz, B. E. [illegible]
(= *retracta*, Walk.), fig. 1, p. 127, *similis*, Feld., fig. 2, *Miresa argentifera*, Walk., pl. cxxix. figs. 1 & 1*a*, p. 128; *Aphen[illegible]*, Walk., figs. 3 & 3*a*, *b*, *aperiens*, Walk., figs. 4 & 4*a*, pl. cxxx. p. 129; *Thosea cervina*, Moore, pl. cxxix. figs. 2 & 2*a*, p. 130; *Narosa conspersa*, Walk., figs. 2 & 2*a*, *b*, *adala*, Moore, figs. 3 & 3*a*, p. 132; *Candyba punctata*, Walk. (= *Belgorea subnotata*, Walk.), fig. 4, p. 133; and *Rabila frontalis*, Walk., fig. 5, pl. cxxxii. p. 135.

Neomiresa argentata, Walk. Transformations described; E. D. Jones, P. Liverp. Soc. xxxvi. pp. 61 & 62.

New genera and species:—

Cheromettia, Moore, Lep. Ceyl. ii. p. 133. Placed after *Candyba*. Type, *Belippa ferruginea*, Moore (redescribed and figured, *l. c.* p. 134, pl. cxxxii. figs. 1 & 1*a*, *b*).

Pinconia, id. P. Liverp. Soc. xxxvi. p. 60. Allied to *Dalcera*. Type, *P. ochracea*, sp. n., *ibid.*, San Paulo, Brazil.

Ulamia, Möschler, Verh. z.-b. Wien, xxxii. p. 339. Referred to the *Cochliopodidæ*, but possibly belongs to the *Cossidæ*. Type, *Phalæna dolobrata*, Cram.

Limacodes codeti, Oberthür, Bull. Soc. Ent. Fr. (6) iii. p. xlviii., Algeria.

Scopelodes auro-grisea, Moore, Lep. Ceyl. ii. p. 126, pl. cxxviii. figs. 1 & 1*a*, *b*, Ceylon.

Aphendala ochracea, id. *l. c.* p. 129, pl. cxxix. figs. 3 & 3*a*, Ceylon.

Thosea duplexa, id. *l. c.* p. 130, pl. cxxxi. fig. 3, Ceylon.

Susica signata, figs. 1 & 1*a*, *b*, and *fraterna*, figs. 2 & 2*a*, id. *l. c.* p. 131, pl. cxxxi., Ceylon.

Narosa rufo-tessellata, id. P. Liverp. Soc. xxxvi. p. 62, San Paulo, Brazil.

DREPANULIDÆ.

Moore, Lep. Ceyl. ii. pl. cxxiv., redescribes and figures *Oreta extensa*, Walk. (= *suffusa*, Walk.), figs. 3 & 3*a*, p. 119, and *Drepana specularis*, Moore, fig. 2, p. 120.

Teldenia, g. n., Moore, *l. c.* p. 119. Placed after *Oreta*. Type, *T. alba*, sp. n., *l. c.* p. 120, pl. cxxiv. figs. 1 & 1*a*, *b* (transformations), Ceylon.

Cobanilla, g. n., *id. l. c.* p. 120. Placed after *Drepana*. Type, *C. marginata*, sp. n., *l. c.* p. 121, pl. cxxiv. fig. 4, Ceylon.

SATURNIIDÆ.

[For sericiculture, *cf.* also BOMBYCIDÆ.]

WAILLY, A. On Silk-producing *Bombyces* reared in 1882. J. Soc. Arts. xxxi. pp. 189–192, 214, 215, 239–241, 340, & 341. [*Cf.* also Bull. Soc. Acclim. (3) x. pp. 625–637.]

Relates to various species, chiefly *Saturniidæ*, including the hybrid

...*egiti* and *pernii* [cf. also Huin, Bull. Soc. Acclim. ...466].

Automeris sp. (described by Moore, xxxvi. p. 56), *A. metea*, Cram., *Adolippa sabina*, Walk., *Arsenura erythrinæ*, Fabr., *Attacus aurota*, Fabr., *Automeris illustris*, *Attacus arethusa* and *jacobææ*, Walk. Transformations noticed, and larva of the latter figured; E. D. Jones, P. Liverp. Soc. xxxvi. pp. 56–60, and xxxvii. pp. 251–254, pl. vii. fig. 4.

Mimallo incerta, Möschl., *Dirphia canitia*, Cram., and *Hyperchiria jucunda*, Cram., noticed; Möschler, Verh. z.-b. Wien, xxxii. pp. 341 & 342.

On rearing foreign *Saturniidæ* at Cannes; Millière, Rev. d'Ent. ii. p. 42.

Samia cynthia, Dru., feeding on sassafras and tulip tree; Birney, Am. Nat. xvii. p. 879 (*cf.* also p. 977). *S. cecropia*, Linn., var. (??) described; Kirby, P. E. Soc. 1883, pp. xxvii. & xxviii. *S. columbia*, Smith: northern range and parasite noticed; Brodie, Papilio, iii. pp. 42 & 43.

Telea polyphemus, Cram. Transformations popularly described and figured; Saunders, Rep. E. Soc. Ont. 1882, pp. 15–18, figs. 6–10. Variety noticed; [Miss] C. M. Edwards, Papilio, iii. p. 123. Var. *oculea* from Arizona described; Neumoegen & Grote, Tr. Kansas Ac. viii. p. 47, Ann. N. H. (5) xi. p. 53, Papilio, iii. p. 71.

Bombyx oubié, Guér. Sexes briefly described; Antinori, Ann. Mus. Genov. xviii. pp. 736 & 737.

Attacus (Antheræa) pernii. On rearing; Fallou, Bull. Soc. Ent. Fr. (6) iii. pp. xxxvii. & xxviii.; Huin & Fallou, Bull. Soc. Acclim. (3) x. pp. 466, 467, & 552–556. Brood destroyed by hail; Douchy, *tom. cit.* pp. 703–707. Specimen with abnormal outline of wings; Camerano, Atti Acc. Tor. xviii. pp. 472 & 473, pl. v. fig. 16.

Antheræa frithi, Moore. On rearing; Fallou, Bull. Soc. Acclim. (3) x. pp. 318–322.

Attacus luna and larva popularly described and figured; Rep. E. Soc. Ont. 1882, pp. 28 & 29, figs. 14 & 15.

Actias selene, Hübn. (= *luna*, Cram., *nec* Dru., = *Plectropteron dianæ*, Hutt.), redescribed and figured; Moore, Lep. Ceyl. ii. pp. 123 & 124, pl. cxxvi. figs. 1 & 1*a*.

Saturnia carpini, W. V. On rearing; aberrations and a hermaphrodite noticed: Lamprecht, Ent. Nachr. ix. pp. 134 & 135. Great destruction of pupæ by parasites, &c.; Elliot, Ent. M. M. xix. p. 237. Larva eaten by a peacock; McLachlan, Ent. M. M. xx. p. 96. Variety of larva; G. Smith, Ent. xvi. p. 261.

Saturnia pavonia. Its parasite, *Spilocryptus fumipennis*, Grav., discussed; Holmgren, Ent. Tidskr. iv. pp. 29–31 & 55.

Hyperchiria coræsus, Boisd., is distinct from *liberia*, Cram.; Berg, An. Soc. Arg. xv. p. 156.

Hemileuca, Walk. (including *Euchronia* and *Eulcucophæus*, Pack.), and *Argyrauges*, Grote. Rearrangement of species; Grote, Canad. Ent. xv. pp. 23 & 24.

Dirphia consularis and *tribunalis*, Burm., = *venata*, Butl.; Berg, *l. c.* p. 155.

[illegible]ar. *b*, Burm., = *brunnea*, Hübn.;

New species :— &c.; *id.* S. E. Z.

Attacus cinctus, Tepper, Bull. Brooklyn Soc. v. p. 65, pl., [illegible] S. Arizona; *A. taprobanis*, Moore, Lep. Ceyl. ii. p. 124, pl. cxxvii. figs. 1 & 1*a*, Ceylon.

Platysamia polyommata, Tepper, *l. c.* p. 66, pl., fig. 3, S. Arizona.

Copaxa hanningtoni, Butler, Ann. N. H. (5) xii. p. 196, Victoria Nyanza.

Antheræa cingalesa, Moore, *l. c.* p. 122, pl. cxxv. figs. 1 & 1*a*, *b*, Ceylon.

Saturnia numida, Austaut, Le Nat. v. p. 359, Algeria.

Automeris ophthalmica, Moore, P. Liverp. Soc. xxxvii. p. 251 (transformations described, E. D. Jones, *tom. cit.* p. 252, pl. vii. fig. 3, larva), Brazil.

Mimallo schulzi, Weyenbergh, Hor. Ent. Ross. xvii. pp. 141–147, pl. vii., Cordova (transformations described and figured) : = *cordubensis*, Berg; Berg, An. Soc. Arg. xvi. p. 271.

Hyperchiria zephyria, Grote, Ann. N. H. (5) xi. p. 52, and Tr. Kansas Soc. viii. p. 47, New Mexico; *H. lama*, Berg, An. Soc. Arg. xv. p. [illegible]6, Salta.

Micrattacus fulviventris, id. *l. c.* p. 157, Missiones.

Dirphia caisa, id. *l. c.* p. 155, Buenos Aires.

Bombycidæ (including Sericiculture).

Annuario della R. Stazione bacologica di Padova, vol. x. [1883].

Dusuzeau, M. Rapport de la commission des soies sur ses opérations de l'année 1882. Ann. Soc. Agric. v. pp. 35–68.

To this is added "Compte Rendu des opérations de la condition des soies de Lyon pendant l'année 1882," consisting of 18 pages of tables (without pagination.)

Riley's pamphlet on the Silkworm [*cf.* Zool. Rec. xix. *Ins.* p. 195] reached a 4th edition in 1883.

J. Soc. Arts, xxxi., includes articles on Tasar silk (pp. 769 & 770), silkworm culture in Ceylon (p. 856), Turkish silk-farming (pp. 933 & 934), silk-industry of the world (pp. 1043–1045), and manufacture of silk at Crefeld (p. 1046).

Report on examination of raw silks; McMurtrie, Bull. Dep. Agric., Ent. iii. pp. 56–71, pl. [illegible].

Notes on Sericiculture, preceded by a reprint of Hutton's paper on Indian silk-producing *Bombyces*, published in 1881; Atkinson, Notes Zool. N.W. Prov. Ind. pp. 188–205.

Notes on rearing silkworms in N. America; Riley, Rep. Dep. Agric. 1883, pp. 101–107.

Bombyx mori. Note on parthenogenesis; Pérez, Act. Soc. L. Bord. xxxvi. p. xxvii.

Trilocha varians, Walk., redescribed and figured; Moore, Lep. Ceyl. ii. p. 136, pl. cxxxiii. figs. 1 & 1*a*, *b*.

...ural history; Buckler, Ent. M. M. xx. ...g; Tugwell, Ent. xvi. pp. 116 & 117.
...*waitesi*, sp. n., Moore, Lep. Ceyl. ii. p. 136, pl. cxxxiii. ...Ceylon.

Lasiocampidæ.

Berg, C. Die Gattung *Tolype*, Hübn., ihre Synonyme und Arten. B. E. Z. xxvii. pp. 101–130.

22 species described by authors under the genera *Tolype*, *Hydrias*, *Cœculia*, *Titya*, *Ocha*, *Pœcilocampa*, *Clisiocampa*, and *Echedorus*, are referred to *Tolype* without hesitation; the type is *Phalæna velleda*, Stoll. 3 species are described as new, and the larvæ of several known species are described. The following synonymy occurs:—*Artace punctivena*, Walk., = *albicans*, Walk.; *Hydrias plana*, Walk., = *mollis*, Sepp. In addition to the 22 species above mentioned, 25 more, described by authors under *Hydrias*, *Artace*, *Ocha*, *Titya*, and *Tolype*, are enumerated as possibly, and 6 others described under those genera and *Lasiocampa* as probably, belonging to *Tolype*. The following genera, among others, are perhaps synonymous with *Tolype*: — *Euglyphis*, Hübn., *Omphalia*, Herr.-Schäff., *Macromphalia*, *Dichromosoma*, Feld., and *Catocephala*, Blanch. Some of the species described by Walker under *Eriogaster* may belong to *Megalopyge*, and others to *Tolype*. The N. American species described under *Clisiocampa* appear to belong to *Trichoda*, Hübn. (*Clisiocampa*, Curt.).

Moore, Lep. Ceyl. ii., redescribes and figures the following species:—*Ganisa postica*, Walk., fig. 3, p. 137; *Messata plumipes*, Walk. (= *rubiginosa*, Walk.), figs. 5 & 5*a*, pl. cxxxiii. p. 138, *æneseens*, fig. 1, *quadrifasciata*, fig. 3, *vialis*, Moore, fig. 4, *tristis*, Feld., fig. 2, p. 139; *Pandala dolosa*, Walk., fig. 5, pl. cxxxiv. p. 140; *Eupterote ochripicta*, Moore, figs. 1 & 1*a*, *b*, *mollifera*, Walk. (= *Tagora antherœata*, Walk., and *Homochroa ornata*, Feld.), figs. 3 & 3*a*, *b*, p. 141, *diffusa*, Walk., fig. 2, pl. cxxxv.; *Tagora murina*, Moore, pl. cxxxvi. fig. 2, p. 142; *Brachytera geminata*, Walk., pl. cxxxvii. figs. 2 & 2*a*, *phalænaria*, Feld., pl. cxxxv. fig. 1, p. 145; *Trabala vishnu*, Lef. (= *Amydona prasina*, pt., Walk.), pl. cxxxviii. figs. 1, 1*a*, *b*, 2, & 2*a*; *Metanastria hyrtaca*, Cram. (= *Bombyx lusca*, Fabr., *B. buddha*, Lef., and *Lebeda plagiata*, Walk.), pl. cxli. figs. 1 & 1*a*, *b*, p. 148; *Estigena nandina*, Moore (= *Gastropacha abstracta* and *Lebeda scriptiplaga*, Walk.), pl. cxlii. figs. 1 & [illegible] p. 149; *Odonestis divisa*, Moore, pl. cxli. fig. 2, p. 150; *Lebeda variegata*, Moore, pl. cxxxix. fig. 1, p. 151; *Suana bimaculata*, Walk. (= *Lebeda concolor* and *Suana simplu*, Moore), pl. civ. figs. 1 & 1*a*, *b*, and *S. cervina*, Moore, pl. cxxxix. figs. 2 & 2*a*, p. 152.

Eacles laocoon, Cram. (= *princeps*, Walk., larva figured, xxxii. pl. v. fig. 17); *Megalopyge citri*, Sepp., *dorsimacula*, Walk. (larva described and figured, with an account of its venomous properties; P. Liverp. Soc. xxxii. p. cii.–civ., pl.), *M.* sp. (fig. 18, larva), *M. tharops*, Cram. (fig. 19, pl. vi.); and *Hydrias deusta*, Herr.-Schäff., xxxvi. pp. 63–69; *Syssiphinx*

[Grote, A. R.] Remarks upon the North American *Heliothinæ*, and their recent literature. Tr. Am. Ent. Soc. x. pp. 257–268. (*Cf.* also Canad. Ent. xv. pp. 84–86.)

Chiefly consists of a reply to J. B. Smith's criticisms. The following genera are specially noticed:—*Rhodosea* and *Triocnemis*, Grote, *Lygranthœcia*, G. & R., *Disocnemis* and *Tricopis*, Grote, and *Heliothis*, Hübn. A revised list of *Heliothinæ* is given, inclusive of *Anarta* and allies. The synonymy (not already given by Smith) is as follows:—*Anarta myrtilli*, Linn. (= *acadiensis*, Beth.), *cordigera*, Thunb. (= *lateritia*, G. & R.), *melaleuca*, Thunb. (= *nigro-lunata*, Pack.), *schœnherri*, Zett. (= *leucocycla*, Staud.), *richardsoni*, Curt. (= *algida*, Lef.), *nivaria*, Grote (= *Mamestra curta* and *Orthosia perpura*, Morr.), *lapponica*, Thunb. (= *amissa*, Lep.), *Nycterophaeta magdalena*, Hulst (= *Epingetis nubeculata*, Grote), *Lygranthœcia cupes*, Grote (= *crotchi*, H. Edw.), *arcifera*, Guén. (= var. *spramationsnote*).

Odonestis, J. B. On the Anatomy of the Nor[th] American *Noctuidæ*.

Clisiocampa, i. The Legs. Bull. Brooklyn Soc. vi. pp. [illegible]23, 33, 34, & 46–48. Stretch, P.

Tolype (Synopsis of the North American Genera of the *Noctuidæ* (con-Gilbert, [illegible]d), with critical notes on various genera. Bull. Brooklyn Soc. figures, p. 3–6, 11–14, 19–22, 27–30, 33–36, 43–46, 53–56.

Pl. Synopsis of the North American *Heliothinæ*. Tr. Am. Ent. Soc. x. pp. 205–256, pls. vii. & viii.

27 genera are admitted, 4 genera and 7 species being described as new, some of the latter by Tepper. The following synonymy is given:—*Heliothis rhexia*, Sm. & Abb. (= *spectandus*, Streck.), *armiger* Hübn. (= *umbrosus*, Grote), *dipsaceus*, Linn. (= *phlogophagus*, G. & R., and *interjacens*, Grote; var. *maritima*, Grasl., = *luteicinctus*, Grote), *scutosus*, Fabr. (= *nuchalis*, Grote), *Chariclea umbra*, Hufn. (= *exprimens*, Walk., and var. *angulata*, Grote), *Alaria gaurœ*, Sm. & Abb. (= *matutina*, Hübn.), *Schinia cumatilis*, Grote (= *sulmata*, Streck.), *gracilenta*, Hübn. (= *oleagina*, Morr., and *imperspicua*, Streck.), *separata*, Grote (= *balba* and *acutilinea*, Grote, and *walsinghami*, H. Edw.), *arcifera*, Guén. (= *arcigera*, Guén.), *saturata*, Grote (= *rubiginosa*, Streck.), *spinosæ*, Guén. (= *hirtella*, G. & R.), *rivulosa*, Guén. (= *marginata*, Haw., *contracta*, *divergens*, and *designata*, Walk.), *brevis*, Grote (var. *atrites*, Grote), *meskeana*, Grote (= *fastidiosa*, Streck., and *rufimedia*, Grote), *Melaporphyria prompta*, Grote (= *venusta*, H. Edw.), *ononis*, Fabr. (= *oregona*, H. Edw.), *Axenus arvalis*, Grote (varr. *amplus* and *ochraceus*, H. Edw.), *Melicleptria pulchripennis*, Grote (= *languida*, H. Edw.), *villosa*, Grote (= *pauxilla* and *persimilis*, Grote), *sueta*, Grote (= *californiensis*, Grote), and *Heliaca nexilis*, Morr. (= *elaborata*, H. Edw.). Pl. vii. represents details, and pl. viii. wings, of a great number of species.

Abnormal appearance of various *Noctuæ* during the mild winter of 1881–82; Kalender, Ent. Nachr. ix. pp. 25 & 26.

Fuchs notices the following *Noctuæ* from the Rheingau (S. E. Z. x pp. 261–264):—*Agrotis lucipeta*, W. V., *occulta*, Linn., *Polyphaenis sericata*, Esp., *Tapinostola musculosa*, Hübn., *Leucania scirpi*, Dup.,

circellaris, Hufn., ab. *nigridens*, Fuchs, *Orthosia lævis*, Hübn., *Xanthia gilvago*, Esp., and var. *ocellaris*, Borkh., and *Cucullia xeranthemi*, Boisd.

Apamea testacea, Hübn., var. (?) *dumerili*, Dup., and *Orrhodia veronicæ*, Hübn., noticed; Curó, Bull. Ent. Ital. xv. pp. 296 & 298.

Prodenia venustula, Walk., = *infecta*, Walk., var.; *Perigea semirufa*, Walk., = *Celæna serva*, Walk.; *Agrotis munda*, Walk., = *aristifera*, Guén.; *Cosmophila indica*, Guén., = *xanthindyma*, Boisd.; *Briarda bolinoides*, Walk., = *Odontodes aleuca*, Guén.: Butler, P. Z. S. 1883, pp. 158–164.

Criticisms on Grote's "Illustrated Essay" on the *Noctuidæ* of N. America; Riley, Bull. Brooklyn Soc. v. pp. 77–79.

List of *Noctuidæ* taken in Orono, Maine, and vicinity; [Mrs.] C. H. Fernald, Papilio, iii. pp. 21–23.

Thaxter, Papilio, iii. pp. 10–19, describes the larva of *Pseudothyatira cymatophoroides*, Guén., *Habrosyne scripta*, Gosse, *Platycerura furcilla*, Pack., *Charadra deridens*, Guén., *Raphia frater*, Grote, *Apatela morula*, G. & R., *vulpina*, *noctivaga*, Grote, *luteicoma*, G. & R., *afflicta*, Grote, *Mamestra grandis*, Led., and *Plusia contexta*, Grote.

Plusia brassicæ, Riley, pls. i. figs. 2 & 2*a*, & xi. fig. 2, *Mamestra chenopodii*, Linn., pls. i. fig. 5, & xii. fig. 1, and *Ceramica picta*, Harr., pls. i. figs. 3 & 3*a*, & xii. figs. 2*a* & 2*b*. Ravages, habits, transformations, parasites, &c., discussed; Riley, Rep. Dep. Agric. 1883, pp. 119–125.

List of N. American *Apatelæ*; Grote, Papilio, iii. pp. 67–70 & 111–117. He admits 54 species of the group, distributed into 10 subgenera.

Revised list of *Calpinæ* and *Stiriinæ*; id. *l. c.* p. 32.

Prodenia commelinæ, Sm. & Abb. (which is distinct from *variolosa*, Walk., which = *cosmioides*, Walk.), *Gonodonta fulvangula*, Geyer (= *maria*, Guén.), and *Remigia mensuralis*, Walk. Transformations described; E. D. Jones, P. Liverp. Soc. xxxvi. pp. 71 & 72.

Pyrrhia illiterata and *Heliothis lupatus*, Grote, noticed by him; Canad. Ent. xv. p. 128.

Feralia jocosa, Guén. Generic characters discussed; *id. l. c.* p. 28.

Acronycta alni: protective colouration of larva discussed; Speyer, S. E. Z. xliv. pp. 419–425, and Stainton, Ent. M. M. xx. p. 82: very young larva noticed; Hellins, *op. cit.* xix. p. 209. *A. psi*: notice of parasite; [Miss] Kingsford, Ent. xvi. pp. 69–71.

Arsilonche henrici, Grote, is distinct from *albo-venosa*, Goetze; Grote, *l. c.* pp. 36 & 37.

Leucania unipuncta, Haw. (army-worm), discussed in great detail; Riley, Rep. U. S. Ent. Comm. iii. chap. iii. pp. 89–156, pls. i. & ii. *Cf.* also Bull. Dep. Agric. Ent. ii. p. 27, & iii. pp. 9–17; Thomas & Coquillett, Rep. Ins. Illin. x. pp. 5–43, figs. 1–4, & xi. pp. 49–61.

Meliana flammea. Transformations described; Buckler, Ent. M. M. xx. pp. 63–68.

Arzama obliquata, G. & R. Habits, &c.; Riley & Kellicott, Am. Nat. xvii. pp. 1169 & 1172, and Canad. Ent. xv. pp. 171 & 174.

Nonagria subcarnea, Kell.: transformations noticed; *iid.* Canad. Ent. xv. pp. 174 & 175. *N. distracta*, Ev., noticed from the Ural; Alphéraky, Rev. mens. Ent. i. p. 19. *N. fulva*, Haw.: larva described; Campbell, Ent. xvi. pp. 261 & 262.

Gortyna nitela, Guén.: life-history, depredations, &c.: Lintner, Rep. Ins. N. York, i. pp. 110–116, fig. 26: boring in young twigs, and also feeding externally on plantain; Osborn, Am. Nat. xvii. p. 1172. *G. appassionata*, Harv., imported from N. America, and destructive to *Sarracenia*; Westwood, Gard. Chron. (2) xx. p. 656, fig. 116.

Nephelodes violans, Guén. Life-history; Lintner, *l. c.* pp. 99–110, figs. 24 & 25.

Prodenia littoralis, Boisd., and *testaceoides*, Guén., are sexes; Piepers & Snellen, Tijdschr. Ent. xxvi. p. cxxxiv.

Mamestra promulsa, Morr., is not an *Anarta*; J. B. Smith, Bull. Brooklyn Soc. v. p. 68.

Miana strigilis. Larva described; Porritt, Ent. xvi p. 91.

Celæna haworthi. Larva described; Campbell, *l. c.* p. 261.

Caradrina albo-signata, Oberth., redescribed and figured; Millière, Ann. Soc. L. Lyon, xxix. pp. 154 & 155, pl. i. fig. 2. *C. taraxaci*, Hübn., and *alsines*, Brahm., noticed; Snellen, Tijdschr. Ent. xxvi. pp. cxxxv. & cxxxvi.

Agrotis. Generic characters and American species noticed; Grote, Canad. Ent. xv. pp. 51–55. He also notices his *A. texana*, *apposita*, and *atrifrons*; Papilio, iii. pp. 76 & 78, and Tr. Kansas Ac. viii. p. 47. Ravages of "cut-worms" in America; Treat, Psyche, iv. p. 80. *A. tritici*, *aquilina*, *obelisca*, and *nigricans*: Warren translates Rössler's observations on their probable identity; Ent. M. M. xix. pp. 278–280. *A. ripæ*, Hübn., var. *desillii*, Pierr.: larva described and figured; Millière, *l. c.* pp. 158 & 159. *A. rogneda*, Staud., noticed from Taganrog; Alphéraky, *l. c.* p. 18. *A. hyperborea*, var. *carnica*, Her.: habits noticed; Höfner, Wien. ent. Z. ii. p. 246. *A. messoria*, Harr., and *scandens*, Riley, discussed and figured; Am. Nat. xvii. p. 422. *A. inermis*, Harr., injurious to *Smilax* in N. America; Bull. Dep. Agric. Ent. ii. pp. 27 & 28.

Triphæna pronuba and *fimbria* sometimes lay as many as 1200 eggs; Hellins, Ent. M. M. xix. p. 209. The former ovipositing on a string; Biggs, Ent. xvi. p. 202.

Panolis piniperda, Panz. Larva described and figured with imago; Millière, *l. c.* pp. 157 & 158, pl. i. figs. 7 & 8.

Taniocampa opima, Hübn. Larva described; Heylaerts, Tijdschr. Ent. xxvi. p. cli.

Cirrhoedia xerampelina. Variety noticed; Meldrum, Ent. xvi. p. 236.

Dicycla oo. Transformations described; Buckler, Ent. M. M. xix. pp. 203–205.

Dianthina carpophaga. Variety described; Dixon, Young Nat. iv. p. 190.

Polia dubia, Dup., var. *typhonia*. Larva described and figured, with imago; Millière, *l. c.* pp. 178 & 179, pl. iv. figs. 10 & 11.

Hyppa rectilinea, Esp., recorded as new to Belgium; Donckier, C.R. ent. Belg. xxvii. p. cxxix.

Cloantha hyperici, Fabr., noticed as new to Sweden; Lampa, Ent. Tidskr. iv. pp. 104 & 223.

Calocampa vetusta. Mode of folding its wings; Lucas, Bull. Soc.

Ent. Fr. (6) iii. p. lviii. Hibernation of *C. vetusta* and *exoleta* ; Chrétien, *tom. cit.* pp. lxiii. & lxiv.

Lithophane pexata var. *washingtonia* from Washington Territory described ; Grote, Papilio, iii. p. 74.

Cucullia absynthii. Larva described; Blandford, Ent. xvi. pp. 44 & 45.

Plagiomimicus, Grote. Grote notices the 3 species : *P. pityochromus*, Grote (= *Schinia media*, Morr.), *expallidus*, Grote, and *tepperi*, Morr. ; Canad. Ent. xv. p. 11.

Cirrophanus triangulifer, Grote, discussed and figured ; it belongs to the *Stiriinæ* : Riley, Am. Nat. xvii. pp. 788–790.

Heliothis armiger, Hübn. Life-history ; Lintner, *l. c.* pp. 116–126, fig. 27 & 28, and French, Rep. Ins. Illin. xi. pp. 82–104. Larva a cannibal; [Mrs.] M. S. Jenkyns, Ent. xvi. p. 23.

Anarta melaleuca, Thunb. Supposed occurrence in Scotland; Watkins, Ent. xvi. pp. 45 & 46.

Erastria venustula. Food-plant, cannibalism, &c. ; Wright & others, Ent. xvi. pp. 81, 114, 136–138, 163, & 164.

Bankia bankiana. Natural history ; Buckler, *l. c.* xx. pp. 77–79.

Tarache erastroides, Guén., and *candefacta*, Hübn. Larva noticed ; Coquillett, Papilio, iii. p. 84.

Brephos nothum, Hübn., var. and habits noticed ; Rudolphi, Ent. Tidskr. ix. pp. 37, 56, & 57 (*cf.* also Conquest, Ent. xvi. pp. 114 & 115).

Leucobrephos, Grote, recharacterized by him. The type is *Anarta brephoides*, Walk. (= *Archicaris resoluta*, Zell., and *Melicleptria hoyi*, Grote). A list of North American *Brepheidæ* is added. *L. c.* pp. 55 & 56.

Calpe minuticornis, Guén., redescribed ; Moore, P. Z. S. 1883, p. 19.

Plusiodonta compressipalpis, Guén. Transformations noticed ; Hoy, Canad. Ent. xv. pp. 172 & 173, and Am. Nat. xvii. p. 1171.

Plusia brassicæ, Riley : action of the heart in larva accelerated by *Pyrethrum* ; Howard, Psyche, iv. p. 19. *P. egena*, Guén., recorded from Indian River, Florida ; Grote, *l. c.* p. 26. *P. orichalcea*, auct. : larva described ; Warren, Ent. M. M. xx. pp. 116 & 117. *P. simplex* and *precationis*, Guén., discussed ; Thomas, Rep. Ins. Illin. xi. pp. 38–43.

Aletia argillacea, Hübn : ravages of Cotton Worm in S. Texas in 1883, and experiments with machinery for destroying it ; Anderson & Barnard, Bull. Dep. Agric. Ent. iii. pp. 31–48 : carried by railroads ; Johnson, Am. Nat. xvii. pp. 545 & 546 : noticed and figured ; Lintner, *l. c.* pp. 7 & 8. *A. argillacea* swarming at a hat store at Pittsburgh in December ; Holland, Bull. Brooklyn Soc. iv. p. 46. *A. xylina*, Say : hibernation in the United States ; Riley, P. Am. Ass. xxxi. pp. 468 & 469.

Gonitis fulvida, Guén. (= *gutta-nivis*, Walk.), and *metaxantha*, Walk., redescribed ; Moore, *l. c.* pp. 19 & 21.

Rusicada albitibia, Walk. (= *nigritarsis*, Walk.), redescribed ; *id. l. c.* p. 20.

Melipotis nigrescens, G. & R., is distinct from *fasciolaris*, Hübn. ; *M. flavipennis*, Harv., is the ♂ : Grote, *l. c.* p. 5.

Catocala semirelicta, Grote, and allies, discussed by Grote, who gives the synonymy as follows :—*C. junctura*, Walk. (= *walshi*, Edw., and *aspasia*,

Streck), *arizonæ*, Grote, and *semirelicta*, Grote (var. *pura*, Hulst); *l. c.* pp. 11–13. *C. cælebs*, Grote, = *badia*, G. & R., var.; *id. l. c.* p. 23. *C. junctura*, Walk., and *ilia*, Cram., noticed; the latter is very variable, and varr. *conspicua*, *duplicata*, *obsoleta*, *decorata*, *umbrosa*, and *confusa* are defined: Worthington, Papilio, iii. pp. 40 & 41. *C. concumbens*, Walk., ab. *hilli*, noticed; Grote, Papilio, iii. p. 43. *C. fraxini*: disease of larva; Finch, Sci. Goss. xix. p. 190. *C. parta*, Guén.: larva described; H. Edwards, Papilio, iii. p. 24. *C. meskii*, Grote: larva described; Bunker, Canad. Ent. xv. p. 100. *C. unijuga*, Walk., taken at sea, off the coast of Newfoundland; Cramer, Bull. Brooklyn Soc. v. p. 90. *C. violenta*, H. Edw., noticed; Grote, Tr. Kansas Ac. viii. p. 50.

Ophideres sp. (? = *archon*, Feld. & Rog.) described from New Zealand; Fereday, Tr. N. Z. Inst. xv. pp. 192 & 193, and N. Z. J. Sci. i. p. 340.

Phyllodes. Table of species, with sketches of hind-wings of 6 species allied to *P. conspicillator*, Cram. (♂ = *inspicillator*, Guén.); Butler, Ann. N. H. (5) xi. pp. 426 & 427. *P. fasciata*, Moore, = *eyndhovii*, Voll.; *id. l. c.* p. 426.

Pandesma anysa, Guén. (= *Cerbia fugitiva*, Walk.), redescribed; Moore, *l. c.* p. 23.

Hypenaria infumata, Feld. & Rog., noticed; Berg, An. Soc. Arg. xv. p. 161. *H. roseipila*, Guén., is distinct from *augusta*, Cram.; Möschler, Verh. z.-b. Wien, xxxii. p. 356.

Grote proposes a new subfamily (*Scole*[*co*]*campinæ*) for *Scolecocampa*, Guén., *Eucalyptera*, Morr., *Doryodes*, Guén., and *Amolitæ* and *Cilla*, Grote; Canad. Ent. xv. pp. 131 & 132.

Exentera, Grote (preoccupied), renamed by him *Exenterella*; id. *l. c.* p. 23.

New genera and species:—

Microsemyra, Butler, P. Z. S. 1883, p. 155. Aspect of *Leucania*, but nearer to *Semyra*. Type, *M. pallida*, sp. n., *ibid.*, Mhow.

Cabralia, Moore, P. Liverp. Soc. xxxvi. p. 70. *Glottulidæ*; type, *P. trifasciata*, sp. n., *ibid.* pl. vi. fig. 20 (larva, which mimics that of a *Danais*), San Paulo, Brazil.

Copimamestra, Grote, Tr. Kansas Ac. viii. pp. 49 & 55, and Ann. N. H. (5) xi. p. 54. Characters of *Mamestra*; front tibiæ with a distinct claw. Types, *Phalæna brassicæ*, Linn., and *C. occidenta*, sp. n., *ll. cc.*, New Mexico.

Gonippa, Möschler, Verh. z.-b. Wien, xxxii. p. 354. Allied to *Rusina*. Type, *G. perusia*, sp. n., *l. c.* p. 354, pl. xviii. fig. 39, Surinam.

Carneades, Grote, Canad. Ent. xv. p. 4. Like *Agrotis*, but with a tubercle on clypeus. Type, *C. mœrens*, sp. n., *ibid.*, Arizona (*cf.* also Grote, Papilio, iii. p. 30).

Trichoclea, id. Papilio, iii. p. 30. Allied to *Carneades*. Type, *T. decepta*, sp. n., *ibid.*, Arizona.

Schoeyenia, Aurivillius, Ent. Tidskr. iv. p. 191. *Noctuidæ*; type, *S. arctica*, sp. n., *l. c.* p. 193, Novaya Zemlya (? = *Amphidasys unifasciatus*, Ménétr.).

Metalepsis, Grote, Canad. Ent. xv. p. 129. Allied to *Pachnobia*. Type, *P. cornuta*, Grote.

Trichorthosia, id. Tr. Kansas Ac. viii. p. 50, and Papilio, iii. p. 31. Allied to *Orthosia*. Type, *T. parallela*, sp. n., *ibid.*, New Mexico.

Trichocosmia, id. Canad. Ent. xv. p. 6. Allied to *Cosmia*, but with hairy eyes. Type, *T. inornata*, sp. n., *ibid.*, Arizona.

Cea, id. Papilio, iii. p. 78. Allied to *Trichocosmia*. Type, *C. immaculata*, sp. n., *ibid.*, Arizona.

Trichopolia, id. *l. c.* p. 76. Form of *Heterocampa* (*Notodontidæ*). Types, *T. dentatella* and *ptilodonta*, spp. nn., *l. c.* p. 77, Arizona.

Lussa, id. Canad. Ent. xv. p. 127. Allied to *Perigea*, but somewhat resembling *Chilo* in shape. Type, *L. nigro-guttata*, sp. n., *ibid.*, Indian River.

Hadenella, id. Papilio, iii. p. 123, and Canad. Ent. xv. p. 122. Allied to *Oncocnemis*. Type, *H. pergentilis*, sp. n., *ll. cc.*, Washington Territory.

Trileuca, id. Tr. Am. Ent. Soc. x. p. 265. Types, *Schinia trifascia*, Hübn., and *tepperi*, Stretch.

Chamæclea, id. *l. c.*, and Canad. Ent. xv. p. 76. *Stiriinæ*; type, *Chariclea pernana*, Grote.

Rhodosea, id. Canad. Ent. xv. p. 4. Appearance of *Heliophila*; allied to *Rhophora*. Type, *R. julia*, sp. n., *l. c.* p. 5, New Mexico.

Pseudanthœcia, J. B. Smith, Tr. Am. Ent. Soc. x. p. 213. Allied to *Ianthinea* and *Lygranthœcia*. Type, *L. tumida*, Grote.

Dasuxpoudœa, id. *ibid.* Allied to *Heliothis*; stouter, fore wings shorter, tarsal claw strongly dentate, &c. Type, *H. lucens*, Morr. (var. *luxuriosa*, Grote).

Pseudotamila, id. *l. c.* p. 238. Differs from *Tamila* by the reniform eyes and armature of fore tibiæ, and from *Melicleptria* by the scaly vesture. Types, *T. vanella*, Grote, and *M. perminuta*, H. Edw.

Pseudacontia, id. *l. c.* p. 246. Allied to *Acontia*. Type, *A. crustaria*, Morr.

Hypocalpe, Butler, *l. c.* p. 157. Allied to *Calpe*. Type, *C. fasciata*, Moore.

Arthisma, Moore, P. Z. S. 1883, p. 20. Placed after *Gonitis*. Type, *A. scissuralis*, sp. n., *ibid.*, Singapore.

Apatela vulpina, Grote, Canad. Ent. xv. p. 8, New York.

Leucania purdii and *blenheimensis*, Fereday, Tr. N. Z. Inst. xv. pp. 195 & 196, and N. Z. J. Sci. i. p. 34, New Zealand.

Nonagria permagna, Grote, Papilio, iii. p. 73, Indian River, Florida; *N. subcarnea*, Kellicott, Am. Nat. xvii. p. 1172, United States.

Tapinostola frumentalis, Lindeman, Bull. Mosc. lviii. (1) pp. 142–156, S. Russia (transformations and ravages described; it is injurious to rye, and sometimes to wheat),

Ufeus sagittarius, Grote, Papilio, iii. p. 31, California.

Tricholita inconspicua, id. Canad. Ent. xv. p. 129, Arizona.

Scolecocampa obscura, id. *l. c.* p. 7, Arizona.

Luperina pozzii, Curó, Bull. Ent. Ital. xv. pp. 296–298, Lesignana.

Mamestra vittula and *memula*, Grote, Tr. Kansas Ac. viii. p. 48, New

Mexico ; *M. bella*, Grote, Papilio, iii. p. 30, New Jersey ; *M. spiculosa*, Arizona, and *ferrealis*, Montana, *id.* Canad. Ent. xv. pp. 28 & 29.

Apamea chloris, Millière, Ann. Soc. L. Lyon, xxix. p. 172, pl. iv. figs. 1 & 2, Italy.

Perigea galaxia, Butler, P. Z. S. 1883, p. 159, Dharmsala (?).

Caradrina cicica, Colorado, and *fragosa* [Arizona ?], Grote, Papilio, iii. pp. 74 & 76.

Agrotis gelida, Schneider, Ent. Tidskr. iv. pp. 77 & 88, Varanger Fjord ; *A. bimarginalis, circumdata, planalis, grandipennis*, p. 54, and *beata*, p. 55, Grote, Tr. Kansas Ac. viii., and Ann. N. H. (5) xi. pp 53 & 54, New Mexico; *A. terrealis* and *invenusta*, id. Tr. Kansas Ac. viii. pp. 47 & 48, New Mexico ; *A. perfusca*, id. Papilio, iii. p. 77, California; *A. citricolor* and *muscosa*, id. Canad. Ent. xv. p. 26, Colorado.

Spælotis fragilis, Butler, P. Z. S. 1883, p. 160, Solun.

Taeniocampa peredia, Maine, p. 32, *perforata*, p. 73, and *virgula*, Arizona, p. 76, Grote, Papilio, iii.

Orthosia rhadama, Millière, Ann. Soc. L. Lyon, xxix. p. 153, pl. i. fig. 1, Alpes Maritimes ; *O. citrina*, Grote, *l. c.* p. 74, Arizona.

Orthodes nitens, id. *l. c.* p. 31, Maine.

Calymnia aquilinea, J. B. Smith, Bull. Brooklyn Soc. v. p. 67, Colorado.

Ammoconia distichoides, Grote, Tr. Kansas Ac. viii. p. 48, New Mexico.

Polia aristaria, Oberthür, Études d'Ent. vii. p. 20, pl. iii. fig. 4, Huambo, Peru.

Oncocnemis curvicollis and *pernotata*, Grote, Canad. Ent. xv. pp. 10 & 25, Arizona.

Homohadena inconstans and *vulnerea*, id. *l. c.* pp. 28 & 29, Arizona.

Heterochroma rivulosa, Möschler, Verh. z.-b. Wien, xxxii. p. 355, pl. xviii. fig. 40, Surinam.

Hadena calberlai, Staudinger, S. E. Z. xliv. p. 181, Campagna ; *H. plutonia*, Grote, *l. c.* p. 9, Maine; *H. discors*, id. Tr. Kansas Ac. vii. [1881] p. 64, Colorado ; *H. juncimacula*, J. B. Smith, *l. c.* p. 67, Utah.

Lithophane guasapata, Grote, Papilio, iii. p. 77, California.

Cucullia cita, id. *l. c.* p. 75, Arizona.

Argyritis pura, Butler, Tr. E. Soc. 1883, p. 86, Chili.

Adipsophanes terminellus, Grote, Canad. Ent. xv. p. 132, Texas.

Schinia obliqua, pls. vii. fig. 15 (tibia), & viii. fig. 25 (wing), Arizona, p. 229, *sordidus* [*-da*], Alabama, p. 230, *alba-fascia*, pls. vii. fig. 20 (tibia), & viii. fig. 31 (wing), Utah, p. 231, and *errans*, pls. vii. fig. 34 (tibia), & viii. fig. 44 (wing), Arizona, p. 235, J. B. Smith, Tr. Am. Ent. Soc. x. ; *S. hulstia*, Tepper, *tom. cit.* p. 228, pl. viii. fig. 19, Texas (?).

Grotella dis, Grote, Tr. Kansas Ac. viii. p. 55, and Ann. N. H. (5) xi. p. 55, New Mexico.

Melicleptria graefiana, Tepper, *l. c.* p. 245, pl. viii. fig. 59, Southern California.

Heliaca dubitans, id. *l. c.* p. 246, pl. viii. fig. 64, Nevada.

Lygranthoecia tenuescens, Grote, Canad. Ent. xv. p. 128, Arizona.

Anthoecia swinhoei, Butler, *l. c.* p. 162, Assirghur.

Œdophron pallens, Tepper, *l. c.* p. 215, Southern California.
Anarta submarina, Grote, *l. c.* p. 4, Montana.
Azenia edentata, id. *l. c.* p. 25, Arizona.
Archearis pusilla, Butler, Tr. E. Soc. 1883, p. 87, Valparaiso.
Calpe bicolor, Moore, P. Z. S. 1883, p. 19, Punjab.
Rusicada-diversalis, id. *l. c.* p. 21, Singapore.
Gonitis trilineata, id. *ibid.* pl. vi. fig. 1, Bombay.
Thalatta albiorbis and *modesta*, id. *l. c.* p. 22, Ceylon.
Apopestes indica, id. *ibid.*, Manpuri.
Pyrophila triquetra, Grote, Papilio, iii. p. 78, Arizona.
Donda striato-virens, Cherra Punjee, and *ornata*, Bombay, Moore, *l. c.* p. 23, pl. vi. figs. 2 & 3.
Pandesma similata, id. *l. c.* p. 24, N.W. India.
Yrias volucris, Grote, Canad. Ent. xv. p. 3, Arizona.
Cænopeta fucosa, Berg, An. Soc. Arg. xv. p. 159, Buenos Aires.
Erchcia pannosa, Malabar, Ceylon, and *uniformis*, Malabar, Moore, *l. c.* p. 24.
Pheocyma umbrina and *termina*, Grote, *l. c.* pp. 3 & 129, Arizona.
Synedoida mucronata, id. *l. c.* p. 121, Arizona.
Spargaloma punctipennis, id. *l. c.* p. 122, Arizona.
Hypocala aspersa, Butler, P. Z. S. 1883, p. 164, Solun.
Catocala sara, French, Canad. Ent. xv. p. 163, Colorado; *C. lucilla*, Worthington, Papilio, iii. p. 39, Illinois, Indiana.
Phyllodes roscigera, Butler, P. Z. S. 1883, p. 164, and Ann. N. H. (5) xi. p. 427, fig. 1, Andamans; *P. cerasifera*, fig. 3, Mindanao, p. 426, and *floralis*, Borneo, p. 427, *id.* Ann. N. H. (5) xi.; *P. maligna*, id. Ent. M. M. xx. p. 138, Ceylon.
Sypna contellata, Dharmsala, *rubrifascia*, p. 24, *prunosa*, *fraterna*, Darjiling, and *renisigna*, Khasia Hills, p. 25, Moore, *l. c.*
Argiva strigipennis, id. *l. c.* p. 25, Khasia Hills.
Nyctipao prunosa, id. *l. c.* p. 26, Kussowli, N.W. Himalaya.
Sericia calamistrata, id. *ibid.*, Andamans.
Spirama jinchuena and *inæqualis*, Butler, Ann. N. H. (5) xi. pp. 115 & 116, Corea.
Hypopyra pallida, Moore, *l. c.* p. 26, Ceylon.
Ophiodes fervida, Butler, P. Z. S. 1883, p. 164, Solun.
Naxia duplexa, Moore, *l. c.* p. 26, pl. vi. fig. 4, Darjiling.
Ophiusa acuta, id. *l. c.* p. 27, pl. vi. fig. 5, Khasia Hills.
Phurys ovalis, Grote, Papilio, iii. p. 75, Arizona.
Celiptera bucetum, id. Tr. Kansas Ac. viii. p. 50, New Mexico.
Dardara fenestrata, Moore, *l. c.* p. 27, pl. vi. fig. 6, Bombay.
Sonagara bivittata, Andaman Isles, *decussata* and *vialis*, Himalaya, *id. l. c.* p. 27, pl. vi. figs. 7–9.
Capnodes stellata, id. *l. c.* p. 28, Singapore.
Acharya costalis, id. *ibid.* pl. vi. fig. 10, Andaman Isles.
Renodes crococephala, Möschler, *l. c.* p. 356, Surinam.
Gyrtona chalybea, Butler, P. Z. S. 1883, p. 163, Solun.
Chadoca (genus recharacterized) *missionum*, Berg. An. Soc. Arg. xv. p. 162, Missiones.

Deltoididæ.

Helia americalis, Guén. Larva feeds in nests of *Formica rufa*; Riley, Am. Nat. xvii. p. 1070.

Simplicia rectalis, Eversm. Natural history; Fuchs, S. E. Z. xliv. pp. 264–268.

New genera and species :—

Byturna, Moore, P. Z. S. 1883, p. 21. Resembles *Rivula*. Type, *Bocana digramma*, Walk.

Charmodia, Möschler, Verh. z.-b. Wien, xxxii. p. 356. Differs from *Mastigophora*, Feld. & Rog., by the absence of a knob on the antennæ. Type, *C. vectis*, sp. n., *l. c.* p. 357, pl. xviii. fig. 42, Surinam.

Asylæa, id. *l. c.* p. 357. Allied to *Diptychophora*, Zell. Type, *A. inflexa*, sp. n., *l. c.* p. 358, pl. xviii. fig. 43, Surinam.

Aphandala misera, Butler, P. Z. S. 1883, p. 166, Assinghur, Mhow.

Pasira biatomea, Moore, P. Z. S. 1883, p. 29, Ceylon.

Litognatha linearis, Grote, Canad. Ent. xv. p. 121, Arizona.

Megachyta inconspicualis, id. *l. c.* p. 30, Adirondacks.

Salia rufa, id. *l. c.* p. 31, Arizona.

Pseudorgyia russula, id. Papilio, iii. p. 75, Arizona.

Geometridæ.

Alphéraky, S. Lépidoptères du district de Kouldja et des montagnes environnantes. 3me partie: *Geometræ*. Hor. Ent. Ross. xvii. pp. 156–227, pls. viii. & ix.

101 species enumerated, some new. The following are the most important known species noticed :—*Phorodesma smaragdaria*, Fabr., and var. *prasinaria*, Ev., *fulminaria*, Led., var. *correspondens*, pl. ix. fig. 85; *Acidalia pecharia*, Staud. (?); *Pellonia vibicaria*, Clerck, varr. *strigata* and *unicolorata*, Staud.; *Stegania dalmataria*, Guén., var.; *Eudropia* (?) (*Azelina* ?) *maracandaria*, Ersch., pl. viii. fig. 67; *Eilicrinia subcordaria*, Herr.-Schäff.; *Ematurga atomaria*, Linn., var. *iliaria*; *Eubolia murinaria*, Fabr., var. *cineraria*, Dup.; *Aspilates gilvaria* var. *orientaria*; *Ligia* (?) *turanica*, Ersch.; *Sterrha albidaria*, Ersch., varr. *gegenaria* and *albipunctaria*, pl. viii. fig. 81; *Ortholitha junctata*, Staud., pl. viii. fig. 84; *Triphosa incertata*, Staud., pl. ix. fig. 93; *Cidaria ferrugata*, Clerck, var. *asiatica*, Staud., pl. viii. fig. 77; *C. tauaria*, Staud., var. (?) *altitudinum*, pl. viii. figs. 78 & 79; *C. riguata*, Hübn., ab. (?); *C. sociata*, Borkh., var. *dubiosata*; *Eupithecia scabiosata*, Borkh, var. *aquistrigata*, Staud., *biornata*, Christoph, and *immutata*, Hufn., var. (?).

Butler, A. G. On the Moths of the Family *Urapterygidæ* in the Collection of the British Museum. J. L. S. xvii. pp. 195–204, pl. ix.

The nomenclature of the neuration of *Lepidoptera* is first discussed; then follows a table of the 10 genera into which the author divides the family, and the rest of the paper deals with genera and species, the plate illustrating the neuration and antennæ of each genus. The following

synonymy occurs:—*Urapteryx ebuleata*, Guén. (= *kantalaria*, Feld. & Rog.), *maculicaudaria*, Motsch. (= *luteiceps*, F. & R.); *Ripula mahometaria*, Herr-Schäff. (= *mexicaria*, Guén.).

GUMPPENBERG, C. VON. Die Flügelschuppen der Geometriden. S. E. Z. xliv. pp. 192 & 193.

The writer gives the result of an examination of 254 species. In every species, there are from eight to ten different forms of scales. They differ in the basal, middle, and marginal areas, as well as on the upper and under surface, and in the sexes. In most cases, the scales are thickest near the base of the subcostal nervure, on the under surface of the forewings, the two principal forms of scales (1) resembling the seeds of an umbelliferous plant, or (2) being feather-like. Certain species agree among themselves as to the greater or less resemblance between the scales on the same parts of the wings.

MEYRICK, E. Monograph of New Zealand *Geometrina*. N. Z. J. Sci. i. pp. 526–531.

89 species of *Geometrina* and 1 of *Siculina* enumerated, 30 being new. Several new genera are also described, a large proportion of which are preoccupied, chiefly in *Lepidoptera* [!] The families of *Geometrina* represented are *Acidaliidæ*, *Larentiidæ*, *Boletobiidæ*, *Lyrceidæ*, and *Ennomidæ*. The following synonymy is given:—*Acidalia rubraria*, Doubl. (= *acidaliaria*, Walk., and *figlinaria*, Guén.), *Elvia glaucata*, Walk. (= *donovani*, Feld.), *Tatosoma lestevata*, Walk. (*ranata*, Feld.), *transitaria*, Walk. (= *mistata*, Feld.), *agrionata*, Walk. (= *tipulata*, *inclinataria*, *collectaria*, Walk.), *Asthena pulchraria*, Doubl. (= *plurilineata*, Walk, and *ondinata*, Guén.), *schistraria*, Walk. (= *subpurpureata*, Walk., and *tuhuata*, Feld. & Rog.), *Scotosia gobiata*, Feld. & Rog. (= *simulans*, *undulifera*, *anguligera*, and *rivularis*, Butl.), *Scotosia deltoidata*, Walk. (= *inclavata*, *perductata*, *congressata*, *conversata*, *descriptata*, *bisignata*, *aggregata*, *congregata*, *plagifurcata*, Walk., *pastinaria*, Guén., *inopiata*, *monoliata*, *perversata*, Feld. & Rog.), *Cidaria rixata*, Feld. & Rog. (= *squalida*, Butl.), *similata*, Walk. (= *timarata*, F. & R.), *Larentia præfectata*, Walk. (= *subtentaria* and *absconditaria*, Walk.), *clarata*, Walk. (= *pyramaria*, Guén.), *cineraria*, Doubl. (= *invexata*, *semisignata*, *inoperata*, *punctilineata*, *dissociata*, *semilisata*, Walk., *corcularia*, *infantaria*, *cupitheciaria*, Guén., and *sphæriata*, F. & R.), *Lyrcea alectoraria*, Walk. (= *primata* and *mixtaria*, Walk., *acroiaria*, F. & R., and *varians*, Butl.), *Hybernia indocilisaria*, Walk. (= *boreophilaria*, Guén.), *Zylobara productata* Walk. (= *pungata* and *fragosata*, F. & R.), *Pseudocoremia lupinata*, Feld. (= *suavis* and *usitata*, Butl.), *melinata*, Feld. (= *indistincta*, Butl.), *Boarmia dejectaria*, Walk. (= *attracta*, *exprompta*, *patularia*, *scriptaria*, *erebinata*, *stigmaticata*, *lignosata*, Walk., *pannularia*, Guén., *masriata*, *sulpitiata*, *caprimulgata*, F. & R.), *Detunda atro-nivea*, Walk. (= *manxifera*, Fered.), *Declana floccosa*, Walk. (= *scabra*, Walk., *verrucosa*, F. & R., *feredayi* and *nigro-sparsa*, Butl.), *Azelina fortinata*, Guén. (= *ziczac*, F. & R.), *Drepanodes muriferata*, Walk. (= *ephyraria*, Walk., *cooparia* and *haastiaria*, F. & R.), *Siculodes subfasciata*, Walk. (= *gallicolens*, Butl.).

PURDIE, A. New Zealand *Larentiidæ*. N. Z. J. Sci. i. pp. 359–366.

A compilation which may be useful to local collectors.

List of *Geometridæ* taken at Quebec and Montreal; Bowles, Canad. Ent. xv. pp. 164–167.

Larvæ of *Geometridæ* with more than ten legs; Chrétien, Le Nat. v. pp. 294 & 295.

Eupithecia interrupto-fasciata, Pack., and *Hibernia tiliaria*, Harr. Life-history, enemies, and remedies; Thomas, Rep. Ins. Illin. xi. pp. 23–31.

Urapteryx politia var. *floridata* from Indian River described; Grote, Canad. Ent. xv. p. 6.

Rumia crataegata. Cf. OSBORNE, *Insecta*, General Subject, *suprà*, pp. 7 & 8.

Epione vespertaria. Variety described; S. Walker, Ent. xvi. p. 211.

Hyperythra swinhoei, Butler, noticed by him; P. Z. S. 1883, p. 169.

Ellopia fasciaria. Habits, larva, and var. *prasinaria*, Hübn., at Brandon noticed; Raynor, Ent. xvi. pp. 16 & 17.

Tetracis vidularia, Grote, noticed by him; Tr. Kansas Ac. viii. p. 51.

Azelina gonopteraria, Guén., var. (?) *peruviæ*, pl. i. fig. 1, and *A. speciosata*, Guén., pl. ii. fig. 1, noticed and figured; Oberthür, Études d'Ent. vii. pp. 23 & 24.

Paragonia latrata, Guén., noticed and figured; *id. l. c.* p. 19, pl. ii. fig. 4.

Eugonia subsignaria, Pack. Transformations noticed; Saunders, Rep. E. Soc. Ont. 1882, pp. 18 & 19.

Hiriera pennaria. Life-history; Chrétien, *l. c.* pp. 286, 287, & 293–295.

Caripeta angustioraria, Walk. Transformations described; Packard, Bull. Dep. Agric. Ent. iii. p. 25.

Nyssia hispidaria and *Phigalia pilosaria*. Rudimentary wings of ♀ noticed; Hodgson, Ent. M. M. xix. p. 186.

Amphidasys betularia, Linn.: aberration described; Fromholz, B. E. Z. xxvii. p. 240. *A. cognataria*, Hübn.: eggs described; Cramer, Bull. Brooklyn Soc. vi. p. 48.

Apochima flabellaria (Heeger), Herr-Schäff., noticed; Ragusa, Nat. Sicil. ii. pp. 136 & 137.

Boarmia repandata, Linn.: hermaphrodite described; Speyer, S. E. Z. xliv. pp. 20–25: notes on breeding and variation; South, Ent. xvi. pp. 270 & 271. *B. syrniaria*, Guén., noticed and figured; Oberthür, Études d'Ent. vii. p. 30, pl. i. fig. 8.

Gnophos dilucidaria, W. V.: larva described and figured, with imago; Millière, Ann. Soc. L. Lyon, xxix. pp. 162 & 163, pl. ii. figs. 6 & 7. *G. dumetata*, Treitschke: young larva noticed; Fuchs, S. E. Z. xliv. pp. 273 & 274.

Dasydia tenebraria, Esp., *Gnophos spurcaria*, Lab., *zelleraria*, Freyer, and *Glacies alticolaria*, Mann. Habits and transformations of these high alpine species discussed; R. Zeller, Kosmos, xiii. pp. 543–546.

Nemoria viridata, Linn., polyphagous; Heylaerts, Tijdschr. Ent. xxvi. p. clii.

Iodis alliata, Höfner, redescribed; Wien. ent. Z. ii. p. 248.

Eucrostis indigenata, Vill. Larva noticed : this is the only European species of the genus, the others placed in it by authors belonging to *Nemoria* ; Millière, Nat. Sicil. iii. pp. 33 & 34.

Byssodes obrussata, Grote. ♂ noticed by him ; Canad. Ent. xv. p. 6.

Cleta pygmæaria, Hübn. Larva described and figured, with imago ; Millière, Ann. Soc. L. Lyon, xxix. pp. 175 & 176, pl. iv. figs. 6 & 7.

Acidalia aversata, Linn., and *inornata*, Haw. : parallel descriptions of larvæ ; Heylaerts, *l. c.* pp. cliii.-cliv. *A. contiguaria* and *degeneraria* : irregular pupation in the same broods ; Fryer, Ent. xvi. pp. 17 & 18. *A. incanaria* var. *obscura*, Bruand, noticed and figured ; Millière, *l. c.* p. 168, pl. iii. fig. 3.

Erosia adjutaria, Walk., = *theclata*, Guén. ; Butler, P. Z. S. 1883, p. 171.

Corycia temerata. Transformations described ; Chrétien, *l. c.* pp. 317, 325, & 326.

Thamnonoma acquiaria, Mill. : sexes, eggs, and young larvæ noticed ; Millière, Nat. Sicil. iii. p. 36. *T. perpallidaria*, Grote, noticed by him ; *l. c.* p. 25.

Semiothisa 8-signata and *californiata*, Pack., noticed ; *id. l. c.* pp. 7, 8, & 127.

Fidonia loricaria, Eversm., noticed as new to Sweden ; Thedenius, Ent. Tidskr. iv. pp. 89, 90, & 119.

Scordylia basilata, Guén., = *Heterusia conduplicaria*, Hübn. ; Berg, Ann. Soc. Arg. xvi. p. 271.

Aspilates dissimilaria, Guén. Wholesale destruction by a species of *Asilus* ; H. Edwards, Papilio, iii. p. 25.

Abraxas grossulariata, Linn., ab. *dohrni* from Novgorod described ; Alphéraky, Rev. mens. Ent. i. pp. 20 & 21.

Panthera pardalaria drinking water to excess ; E. D. Jones, P. Liverp. Soc. xxxvii. pp. lxxvi. & lxxvii., and Nature, xxviii. p. 55.

Alsophila hypparia, Feld. & Rog., = *Oratha significata*, Walk., which is not a *Galleria*, but a Geometer ; Butler, Tr. E. Soc. 1883, p. 51.

"Canker worms" (*Palæocrita vernata*, Peck, figs. 1–4), and *Anisopteryx pometaria*, Harr., figs. 5–8, discussed in detail ; Riley, Rep U. S. Ent. Comm. chap. vii. (pp. 157–197, pl. iii.) & App. pp. 82–84.

Larentia cyanata, Hübn. Larva described and figured ; Millière, *l. c.* pp. 170 & 171.

Eupithecia. Supplementary notes on the species of Austro-Hungary, including the description of *E. scabiosata* ab. *orphnata* ; Bohatsch, Wien. ent. Z. ii. pp. 185–188 & 227–230. *E. denticulata*, Treitschke, *rectangulata*, Linn., and *expallidata*, Guén., noticed from the Rheingau ; Fuchs, S. E. Z. xliv. pp. 274 & 275. *E. miserulata*, Grote, and *luteata*, Pack., noticed, and larva of the former described ; Packard, Bull. Dep. Agric. Ent. iii. p. 24. *E. nepetata*, Mab., probably = *imparata*, Hübn. ; Höfner, Wien. ent. Z. ii. p. 279. *E. strobilata* and *togata* discussed ; Speyer, S. E. Z. xliv. pp. 25 & 26. *E. pumilata*, Hübn. : ravages ; L'Italia agricola, 1883 (*cf.* Bull. Ent. Ital. xv. p. 195). *E. scriptaria*, Herr.-Schäff. : transformations described ; Habich, Wien. ent. Z. ii. p. 244. *E. sinuosaria*, Ev., noticed from the Ural ; Alphéraky, *l. c.* p. 19. *E. suc-*

centuriata, Linn. : food-plants and habits of larva noticed; Schmidt, Ent. Nachr. ix. pp. 24 & 25.

Rhopalodes, Guén., recharacterized ; Berg, *l. c.* xv. pp. 163 & 164.

Thera ulicata, Hübn. (? = *firmata*, Hübn., var.), redescribed, and *simulata*, Hübn., noticed and figured ; Millière, *l. c.* pp. 155–157, pl. i. figs. 3–c, & pp. 165 & 166, pl. ii. fig. 11.

Hypsipetes elutata, Hübn., apparently feeding on heath ; Weir & others, Ent. xvi. pp. 18, 47, 62, & 63.

Melanippe montanata, Borkh. Larva with antennæ and prolegs of imago developed ; Jones, Ent. xvi. p. 121, fig.

Scotosia umbrinata, Guén., var. *velutina* from Huambo, Peru, noticed and figured ; Oberthür, Études d'Ent. vii. p. 35, pl. iii. fig. 16.

Cidaria aqueata, Hübn. : larva described and figured, with imago ; Millière, *l. c.* p. 164, pl. ii. figs. 8 & 9. *C. fluviata*, Hübn., noticed ; Snellen, Tijdschr. Ent. xxvi. pp. cxxxiv. & cxxxv. *C. incursata*, Hübn. : transformations described ; Hoffmann, S. E. Z. xliv. pp. 275–277. *C. munitata*, Hübn. : larva described ; Gross, Ent. Nachr. ix. pp. 216 & 217. *C. rectifasciaria*, Led., noticed from Taganrog ; Alphéraky, *l. c.* p. 19. *C. sagittata*, Fabr. : larva described ; Teich, S. E. Z. xliv. p. 174.

Eubolia palumbaria. Black variety ; Porritt, Ent. xvi. p. 188.

Ortholitha coarctata, Hübn. Larva described and figured, with imago ; Millière, *l. c.* pp. 167 & 168, pl. iii. figs. 1 & 2.

Chesias occidentaliata, Pack., = *Eupithecia subapicata*, Guén. ; Grote, *l. c.* p. 27.

Graphidipus flaviceps, Feld. & Rog., = *Terenodis pisciata*, Guén. ; Berg, *l. c.* xvi. p. 271.

New genera and species :—

Tristrophis, Butler, J. L. S. xvii. p. 199, pl. ix. figs. 3 & 4. Allied to *Urapteryx* ; hind-wings with subcostal branches emitted from a short foot-stalk, and second and third median branches separated at their origins. Type, *U. veneris*, Butl.

Gonorthus, id. *l. c.* p. 200, pl. ix. figs. 9 & 10. Allied to *Urapteryx* ; fore wings with acute apex, and straight outer margin ; hind-wings with rectangular outer margin, the angle not preceded by a short angle. Type, *U. flavo-fimbria*, Walk. (may also include *U. tesserata*, Guén., and *breciaria*, Hübn.).

Sirinopteryx, id. *l. c.* p. 201, pl. ix. figs. 15 & 16. Form of *Gonorthus*, and neuration of *Tristrophis*. Type, *Urapteryx rufivinctata*, Walk.

Nepheloleuca, id. *ibid.* pl. ix. figs. 11 & 12. Allied to *Gonorthus* ; antennæ in ♂ not pectinated, but with fine short cilia along the anterior margin. Type, *Phalæna politia*, Cram.

Thinopteryx, id. *l. c.* p. 202, pl. ix. figs. 13 & 14. Placed after *Nepheloleuca*. To include *Urapteryx crocopterata*, Koll. (type), *pratoraria*, F. & R., *delectans*, Butl., and *T. nebulosa*, sp. n., *l. c.* p. 203, Silhet.

Xeropteryx, id. *l. c.* p. 203, pl. ix. figs. 5 & 6. Doubtfully belonging to *Urapterygidæ* ; subcostal five-branched, all given off from a long foot-stalk emitted before the end of the cell. Types, *Urapteryx columbicola*, Walk., and *X. simplicior*, sp. n., *l. c.* p. 204, Sarawak.

Eschropteryx, Butler, *l. c.* p. 204. New name for *Chærodes* (preoccupied). To include *C. tetragonata*, Guén. (= *bifiliaria*, Feld & Rog.), type, *transpectans* and *invariaria*, Walk., *sectata* and *invisata*, Guén., and *striata*, Stoll.

Gyrochærodes, Grote, Tr. Kansas Ac. viii. p. 55, and Ann. N. H. (5) xi. p. 55. New name for *Chærodes*, Guén. (preoccupied), = *Eutrapela*, Pack., *nec* Hübn.

Scotorythra, Butler, Ent. M. M. xix. p. 177. Allied to *Boarmia*, but with a deceptive resemblance to *Scotosia*. To include *S. rara* and *corticea*, Butl., and *S. arboricolens*, sp. n., *ibid.*, Hawaiian Islands.

Delocharis, id. P. Z. S. 1883, p. 172. Aspect of *Idæa*, but allied to *Coremia*. Type, *D. herbicolens*, sp. n., *ibid.*, Solun.

Stigma, Alphéraky, Hor. Ent. Ross. xvii. p. 164. Allied to *Zonosoma* (?). Type, *S. kuldschaensis*, sp. n., *ibid.* pls. viii. fig. 83, & ix. fig. 98, Kulja.

Imitator, id. *l. c.* p. 170. Placed after *Eilicrinia*. Type, *E. dentistrigata*, sp. n., *l. c.* p. 171, pl. ix. figs. 95, 95*a*, *b*, & 96, Kulja.

Kuldscha, id. *l. c.* p. 206. Allied to *Triphosa*, *Eucosmia*, and *Scotosia*, but ♂ antennæ bipectinated, and margin of wings entire. Type, *K. staudingeri*, sp. n., *l. c.* p. 207, pl. ix. fig. 94, Kulja.

Prosoparia, Grote, Canad. Ent. xv. p. 130. Differs from *Fidonia* by the long labial palpi. Type, *F. perfuscaria*, sp. n., *ibid.*, Arizona.

Lycauges, id. Tr. Kansas Ac. viii. p. 52. Allied to *Sicya* and *Heterolocha*. Type, *L. aululuria*, sp. n., *ibid*, New Mexico.

Lagynopteryx, Berg, An. Soc. Arg. xv. p. 166. Allied to *Rhopalodes* and *Tomopteryx*. To include *T. betulata* and *laciniosa*, Feld. & Rog., and *L. valdiviana*, sp. n., *ibid.*, Valdivia.

Theoxena, Meyrick, N. Z. J. Sci. i. p. 526. Allied to *Acidalia*; antennæ of ♂ with long tufts of cilia; vein 8 of hind-wings free, 6 and 7 from a point, or stalked.

Parysatis, id. ibid. *Larentiidæ*; antennæ of ♂ pecticated; areole simple; vein 8 of hind-wings free, united to 7 by a tranverse median bar. Type, *P. porphyrias*, sp. n., *ibid.*, New Zealand.

Hippolyte ‖, id. ibid. *Larentiidæ*; palpi slender; antennæ of ♂ minutely ciliated; vein 6 out of 9; areole simple. Type, *Ptychopoda rubropunctaria*, Doubl. (= *risata* and *mullata*, Guén., and *pulchraria*, Butl.).

Epiphryne, id. ibid. *Larentiidæ*; antennæ of ♂ pectinated; vein 6 from a point with 9, 7 below angle of areole, areole simple, 11 out of areole. Type, *Cidaria undosata*, Feld. & Rog.

Hermione, id. *ibid.* Allied to *Epiphryne*, but vein 6 out of 9, 7 from angle of areole. Type, *H. xanthaspis*, sp. n., *ibid.*, New Zealand.

Thyone, id. *l. c.* p. 527. Characters of *Epiphryne*, but vein 6 from below 9, 11 out of 9. Type, *Aspilates abrogata*, Walk. (= *sercularia*, Guén.).

Panopæa ‖, id. *ibid.* Characters of *Hermione*, but vein 7 from below angle of areole. Type, *Cidaria verriculata*, Feld. & Rog.

Eurydice, id. *ibid.* Characters of *Hermione*, but vein 7 from above areole. Type, *E. cymosema*, sp. n., *ibid.*, New Zealand.

Harpalyce ‖, id. *ibid.* Characters of *Epiphryne*, but vein 11 out of 9.

To include *Larentia megaspilata*, Walk. (= *assata* and *nebata*, Feld. & Rog., and *rufescens*, Butl.), and *humeraria*, Walk. (? = *obtusaria*, *flexata*, *obtruncata*, and *fusiplagiata*, Walk., and *cinerascens*, Feld. & Rog.).

Stratonice, Meyrick, *l. c.* p. 527. Characters of *Eurydice*, but vein 2 from below 9; palpi with very long hairs. Type, *Fidonia* (?) *eutopyrrha*, Butl.

Pasiphila, id. *ibid.* Allied to *Elvia*; but antennæ of ♂ with fascicles of cilia. Type, *Eupithecia bilineolata*, Walk. (= *E. muscosata*, *indicataria*, *inexpiata*, *semi-albata*, Walk., *cidariaria*, Guén., *fumipalpata* and *aquosata*, Feld., *charybdis* and *calida*, Butl.).

Epyaxa, id. *ibid.* Characters of *Larentia*, but vein 6 in a point with 9. To include *Coremia roseata*, Doubl. (= *ardularia* and *inamœnaria*, Guén.), *semifissata*, Walk. (= *hypsilonaria* and *delicatularia*, Guén.), and *E. orophylla* and *chlamydota*, spp. nn., *ibid.*, New Zealand.

Arsinoe, id. *ibid.* Allied to *Larentia*; antennæ dentate, ciliated. To include *Aspilotes subochraria*, Doubl. (= *strangulata* and *pusinata*, Guén.), and *A. triphragma*, sp. n., *ibid.*, New Zealand.

Pasithea, id. *l. c.* p. 529. Characters of *Larentia*, but thorax densely hairy beneath. To include *Aspilates insignis* and *ferox*, Butl., *perornata* and *brephos*, Walk. (*brephos* = *brephosata*, Walk., *catocalaria*, Guén., and *enysi*, Butl.), and *P. orphnæa*, *mechanitis*, *paradelpha*, *strategica*, *callicrena*, *niphocrena*, *zopyra*, *vulcanica*, and *omichlias*, spp. nn., *ibid.*, New Zealand.

Statira, id. *ibid.* Characters of *Pasithea*, but antennæ of ♂ simple, filiform. To include *Fidonia anceps* and *hectori*, Butl., and *S. homomorpha*, sp. n., *ibid.*, New Zealand.

Cephalissa, id. *ibid.* Allied to *Panagra*; palpi shorter, antennæ of ♂ filiform, minutely ciliated, vein 6 rising from a point with 9. Type, *C. siria*, sp. n., *l. c.* p. 530, New Zealand.

Barsine, id. *l. c.* p. 530. Characters of *Boarmia*, but veins 10 and 11 both separate, 12 free. Type, *Scotosia panagrata*, Walk. (= *menanaria*, Walk., *antipodaria*, F. & R., *desiccata* and *arenacea*, Butl.).

Atossa, id. *ibid.* Characters of *Declana*, but antennæ not pectinated, areole simple. Type, *D. niveata*, Butl.

Phyllodoce, id. *ibid.* Characters of *Azelina*, but coxæ and femora densely hairy. Type, *P. nelsonaria*, Feld. (= *felix*, Butl.).

Amastris, id. *ibid.* Characters of *Boarmia*, but antennæ of ♂ shortly ciliated. Type, *A. encausta*, sp. n., *ibid.*, New Zealand.

Stratocleis, id. *ibid.* Characters of *Azelina*, but antennæ of ♂ shortly ciliated; vein 12 shortly touching 11. Types, *Selenia gallaria*, Walk. (= *palthidata*, F. & R.), and *S. streptophora*, sp. n., *ibid.*, New Zealand.

Urapteryx peruvianaria, Oberthür, Études d'Ent. vii. p. 16, pl. iii. fig. 14, Huambo, Peruvian Amazons; *U. nivea*, Butler, J. L. S. xvii. p. 199, Tokei, Japan.

Prochærodes catenulata, Grote, Tr. Kansas Ac. viii. p. 56, and Ann. N. H. (5) xi. p. 55, New Mexico.

Sabulodes boarmidaria, pl. iii. fig. 9, Huambo, and *jelskii*, pl. i. fig. 16, Tambillo, Oberthür, *l. c.* p. 17.

Clysia œdipodaria, Oberthür, *l. c.* p. 19, pl. ii. fig. 8, Tambillo, Peru.
Crocopteryx callioparia, id. *l. c.* p. 20, pl. iii. fig. 15, Huambo, Peru.
Sicya pomona, id. *l. c.* p. 21, pl. iii. fig. 11, Peru.
Nematocampa angulifera, id. *ibid.* pl. iii. fig. 12, Huambo, Peru.
Selenia vitraria, Grote, Tr. Kansas Ac. viii. p. 51, New Mexico.
Endropia sesquilinearia, id. Canad. Ent. xv. p. 125, Arizona.
Tetracis simpliciaria and *oblentaria*, id. *l. c.* pp. 27, 126, & 127, Arizona, &c.
Azelina (?) *crocallinaria*, pl. iii. fig. 5, Tambillo, Peru, p. 21, *A. emmaria*, fig. 3, p. 22, *incarum*, fig. 2, *xylonaria*, fig. 7, pl. ii., Huambo, Peru, p. 24, *marcaria*, fig. 3, *mathanaria*, fig. 4, Tocantins, Amazons, &c., p. 25, *adrastaria*, fig. 2, Huambo, *odonaria*, fig. 5, pl. i., New Granada, p. 26, *periculosaria*, pl. ii. fig. 6, Huambo, *scitaria*, pl. iii. fig. 10, p. 27, and *beatricaria*, pl. ii. fig. 5, Tambillo, p. 28, Oberthür, *l. c.*
Crocallis auberti, id. Bull. Soc. Ent. Fr. (6) iii. p. xlviii., Sebdou, Algeria.
Eugonia undilineata, Butler, Tr. E. Soc. 1883, p. 87, Chili.
Caripeta subochrearia, Grote, *l. c.* p. 9, North Carolina; *C. æqualiaria*, id. Tr. Kansas Ac. viii. p. 56, and Ann. N. H. (5) xi. p. 56, New Mexico.
Eubyjæ mexicanaria, id. Tr. Kansas Ac. viii. p. 51, New Mexico.
Phigalia plexilixaria, id. *l. c.* p. 52, New Mexico; *P.* (?) *suidunaria*, Alphéraky, Hor. Ent. Ross. xvii. p. 174, pl. ix. figs. 89 & 89*a*, Kulja.
Cleora vinata, Grote, Canad. Ent. xv. p. 133, Montana.
Mecocera peninsularia, id. Papilio, iii. p. 79, Indian River, Florida.
Almodes rivularia, id. *ibid.*, Indian River.
Ophthalmophora braniekiaria, Oberthür, *l. c.* p. 32, pl. ii. fig. 9, Huambo, Peru.
Boarmia vidriadaria, pl. iii. fig. 3, Huambo, Peru, *roccaria*, fig. 6, p. 29, *chalcea*, fig. 7, New Granada, *ciocolatinaria*, fig. 9, Tambillo, Peru, p. 30, *salmoncaria*, New Granada, fig. 10, pl. i., *huambaria*, fig. 2, Huambo, and *anaisaria*, fig. 7, pl. iii., Peru, p. 31, *id.* l. c.; *B. viertli*, Bohatsch, Wien. ent. Z. ii. pp. 111–114, figs., Hungary; *B. songarica*, Alphéraky, *l. c.* p. 176, pl. viii. fig. 73, Kulja.
Cymatophora (*Boarmia*) *depromaria*, p. 87, *C.* (*B.*) *griseata*, *C.* (*B.*) *separataria*, *C.* (*B.*) *obliquaria*, p. 124, and *C.* (*B.*) *rufaria*, p. 125, Grote, Canad. Ent. xv., Arizona.
Gnophos difficilis, pl. ix. fig. 86, and *sericaria*, pl. viii. fig. 80, Alphéraky, *l. c.* pp. 178 & 180, Kulja.
Nemoria carnifrons, Butler, P. Z. S. 1883, p. 169, Mhow, Solun.
Haplodes arizonaria, Grote, *l. c.* p. 125, Arizona.
Chlorosea albaria, id. *l. c.* p. 126, Arizona.
Ephyra admirabilis and *mira*, Oberthür, *l. c.* p. 33, pl. ii. figs. 10 & 12, Huambo, Peru; *E. dharmsalæ*, Butler, *l. c.* p. 169, Dharmsala.
Zonosoma lennigiaria, Fuchs, S. E. Z. xliv. p. 268, Lennig.
Hyria bilineata, Butler, *l. c.* p. 170, Assirghur.
Acidalia schæyeni, Schneider, Ent. Tidskr. iv. p. 80, Varanger Fjord; *A. cumulata*, pl. viii. fig. 69, and *characteristica*, pl. ix. fig. 87, Alphéraky, *l. c.* pp. 160 & 162, Kulja.

Timandra sympathica, Alphéraky, *l. c.* p. 166, pl. viii. fig. 76, Kulja.

Semiothisa rogenhoferi, Oberthür, *l. c.* p. 16, pl. iii. fig. 13, Peru; *S. labradoriata*, Möschler, S. E. Z. xliv. p. 118, Labrador; *S. colorata*, Arizona, p. 7, *patriciata*, [illegible] and *denticulata*, California, p. 527. Characters of *Eu[illegible]*, p. 133, Grote, *l. c.* [illegible] long hairs. Type, *Fidonia* (-

Halia packardaria Allied to *Elcia;* but ante[illegible], Solun, Umballa, and *Tephrina granita*[illegible]*hecia bilineolata*. W[illegible] *zebrina*, Mhow, Bu[illegible], Walk[illegible] Kansas Ac. viii. p. 66, and Ann. N. H. (5) xi. p. 55, New [illegible] *Phasiane cruciata*, [illegible]co. *Jeri*, Alphéraky, *l. c.* p. 186, pl. viii. fig. 82, Kulja.

Eusarca starebaria, Oberthür, Bull. Soc. Ent. Fr. (6) iii. p. xlix., *Selid*, Algeria.

Fidonia alternaria and *partitaria*, Grote, Canad. Ent. xv. pp. 27 & 130, New Mexico.

Heliothea iliensis and *christophi*, Alphéraky, *l. c.* pp. 189 & 191, pl. ix. figs. 88 & 90, Kulja.

Tornos cupetheciaria and *pygmeolaria*, Grote, *l. c.* p. 24, Arizona.

Aspilates insignis, Alphéraky, *l. c.* p. 185, pl. viii. p. 72, Kulja; *A. chiarinii*, Oberthur, Ann. Mus. Genov. xviii. p. 739, pl. ix. fig. 9, Abyssinia.

Nadagara grisea, Butler, *l. c.* p. 172, India.

Icterodes sordida, id. Ann. N. H. (5) xi. p. 116, Corea.

Larentia nephelias, cataphracta, chlorias, psamathodes, helias, prasinias, chionogramma, petropola, p. 528, and *anthracias*, p. 529, Meyrick, N. Z. J. Sci. i., New Zealand.

Eupithecia latoniata, Millière, Ann. Soc. L. Lyon, xxix. p. 165, pl. ii. fig. 10, Alpes-Maritimes; *E. subpulchrata*, pl. viii. fig. 75, and *minusculata*, pl. ix. fig. 91, Alphéraky, *l. c.* pp. 221 & 225, Kulja.

Rhopalodes argentina, Berg, An. Soc. Arg. xv. p. 164, Corrientes.

Tomopteryx viduaria, id. *l. c.* p. 165, Valdivia.

Petrophora excurvata, Colorado, and *mirabilata*, Arizona, Grote, *l. c.* p. 123.

Hypsipetes chiloensis, Butler, Tr. E. Soc. 1883, p. 88, Chili.

Scotosia instabilis and *S.* (?) *pulchrata*, Alphéraky, *l. c.* pp. 201 & 204, pl. ix. figs. 92 & 97, Kulja.

Cidaria intermediaria, p. 211, *tianschanica*, figs. 70 & 71, p. 213, and *fulminata*, fig. 68, pl. viii. p. 218, Alphéraky, *l. c.*, Kulja; *C. unda*, fig. 1, Huambo, Peru, *lichenea*, fig. 6, p. 34, and *graphidiparia*, fig. 8, Tambillo, Peru, p. 35, Oberthür, Études d'Ent. vii. pl. iii.; *C. flavo-lineata*, Staudinger, S. E. Z. xliv. p. 182, Granada; *C. triphragma* and *chaotica*, Meyrick, *l. c.* p. 528, New Zealand; *C. purpurifera*, Fereday, N. Z. J. Sci. i. p. 531, New Zealand.

Psaliodes mathewi, Butler, *l. c.* p. 89, Valparaiso.

Eubolia cecchii, Oberthür, Ann. Mus. Genov. xviii. p. 739, pl. ix. fig. 10, Abyssinia.

Ortholitha sinensis, pl. viii. fig. 74, and *sartata*, pl. ix. fig. 99, Alphéraky, *l. c.* pp. 196 & 198, Kulja.

Lithostege arizonata, Grote, *l. c.* p. 126, Arizona.

PYRALIDÆ.

SNELLEN, P. C. T. *Lepidoptera* van Celebes, verzameld door M. C. Piepers, met aanteekeningen en beschrijving der nieuwe soorten. Tweede [illegible]ng: *Heterocera*. IV. *Pyralidina*. Tijdschr. Ent. xxvi. pp. 119–144, pls. vi.–viii.

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Pionea (*Orobena*) *rimosalis*, Guén., pls. i. figs. 4 & 4*a*, & xi. figs. 4*a–d*, and *Botis repetitalis*, Grote. Transformations, habits, &c., described ; Riley, Ann. Rep. Dep. Agric. 1883, pp. 126–129.

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Anæglis demisalis, Led. Habits and transformations described ; Ashmead, Florida Agriculturalist, iv. p. 60 [1881] (*cf.* Psyche, iv. p. 16).

Eudioptis hyalinata, Linn. Transformations popularly described and figured ; Saunders, Canad. Ent. xv. pp. 56 & 57, fig. 3.

Botis. Coquillett describes the larvæ of *B. oscitalis*, Grote, *generosa*, G. & R., and *inæqualis*, Guén.; Papilio, iii. pp. 101 & 102. *B. dotatalis*, Christoph, = *tithonialis*, Zell.; *B. extinctalis*, Chr., *nec* Led., must be renamed; *B. hilaralis*, Chr., = *costalis*, Eversm.; *Herpetogramma expictalis*, Chr., is a *Botis*; *Agrotera fenestralis*, Chr., will form a new genus: Snellen, Tijdschr. Ent. xxvi. p. 182. *B. niveicilialis*, Snell., *nec* Grote, renamed *albo-fimbrialis*; id. *l. c.* p. 128. *B. aurantiacalis*, Rössl., and *pygmæalis*, Dup. (*obfuscata*, Scop.): transformations noticed; Constant, Ann. Soc. Ent. Fr. (6) iii. p. 5 & 6. *B.* (?) *flexissimalis*, Walk., = *Zebronia perspicualis*, Walk.; and *B. venosalis*, Walk., = *catalaunalis*, Dup.: Butler, P. Z. S. 1883, pp. 167 & 168.

Pionea stramentalis, Linn. Larva described; Thomas, Rep. Ins. Illin. xi. p. 36.

Phycopterus, Blanch., is allied to *Spilodes*; *P. flavellus* and *signariellus*, Blanch., noticed and figured: Butler, Tr. E. Soc. 1883, pp. 53 & 54, pl. xi. figs. 1 & 2.

New genera and species:—

Gyptitia, Snellen, Tijdschr. Ent. xxvi. p. 138. Allied to *Botis*, *Meroctena* and *Botioides*. Type, *G. gonialis*, sp. n., *l. c.* p. 139, pl. viii. figs. 9 & 9*a*, *b*, Macassar.

Orthomecyna, Butler, Ent. M. M. xix. p. 178. Differs from *Mecyna* in its less prominent eyes, less pointed, and loosely scaled palpi, &c. Type, *M. exigua*, Butl. (var. n. *cuprcipennis* described, p. 179); add *O. albicaudata*, sp. n., *l. c.* p. 178, Hawaiian Islands.

Melanomecyna, id. *l. c.* p. 179. Allied to *Mecyna*; palpi long-scaled, truncated; wings sooty black; rather narrow and pointed; size small. To include *M. ennychioides* and *nigrescens*, Butl.; add *M. stellata*, sp. n., *ibid.*, Hawaiian Islands.

Paravdis obliqualis, Grote, P. Kansas Ac. viii. p. 56, and Ann. N. H. (5) xi. p. 56, New Mexico.

Prorasea indentalis, id. Ann. N. H. (5) xi. p. 57, Washington Territory.

Pyralis platymitris, Butler, P. Z. S. 1883, p. 166, Solun.

Actenia rubescens, id. Tr. E. Soc. 1883, p. 51, Valparaiso.

Leucinodes discisigna, Moore, P. Z. S. 1883, p. 29, Darjiling.

Rhodaria purpuraria, Butler, *l. c.* p. 52, Chili.

Hydrocampa tenera, id. P. Z. S. 1883, p. 167, Kurrachee.

Chrysendeton avernalis, Grote, Tr. Kansas Ac. viii. p. 53, New Mexico.

Orobena submundalis, Millière, Ann. Soc. L. Lyon, xxix. p. 160, pl. ii. fig. 2, Alpes-Maritimes; *O. mitis*, Butler, Tr. E. Soc. 1883, p. 53, Valparaiso.

Botis radiosalis, Möschler, S. E. Z. xliv. p. 123, Labrador.

Erilusa (Walk., genus recharacterized, ibid.) *dianalis*, id. Verh. z.-b. Wien, xxxii. p. 359, pl. xviii. fig. 44, Surinam.

Scopula amitina, *cinerea*, p. 54, *indistincta*, and *melanosticta*, p. 55, Butler, *l. c.*, Chili; *S. litorea*, id. Ent. M. M. xix. p. 178, Hawaiian Islands.

Astura fluminalis, id. Ann. N. H. (5) xi. p. 428, Viti Levu.

CRAMBIDÆ.

BAKER, G. T. On the Species of European *Crambi* allied to *C. pinellus*. Ent. M. M. xix. pp. 239–244, & xx. pp. 157–160.

16 species discriminated, and subsequently described at length.

Meyrick makes the following synonymic notes on New Zealand *Crambidæ* (Tr. N. Z. Inst. xv. pp. 6–33):—*Cryptomima acerella*, Walk. (= *Botis mahanga*, Feld. & Rog.), *Diptychophora lepidella*, Walk. (= *Crambus gracilis*, F. & R.), *Crambus ramosellus*, Doubl. (= *C. rangona*, F. & R.), *angustipennis*, Zell. (= *Chilo leucanialis*, Butl.), *vittellus*, Doubl. (= *nexalis* and *transcissalis*, Walk., *nitidicellus*, *bisectellus*, and *incrassatellus*, Zell., and *vapidus*, Butl.), and *tuhualis*, Feld. (= *vulgaris*, Butl.).

Acrobasis glaucella, Staud., *Myelois cribrum*, W. V., *Dioryctria mendacella*, Staud., *cænulentella*, Zell., *Nephopteryx sublineatella*, Staud., and *Ephestia gnidiella*, Mill. Transformations noticed; Constant, Ann. Soc. Ent. Fr. (6) iii. pp. 6–12.

Eudorea murana, Curt., noticed; Stainton, Ent. M. M. xx. pp. 84 & 85.

Scoparia frequentella, Staint.: aberration described; Ragonot & Jourdheuille, Cat. Lep. Aube, p. 224. *S. conspicualis*, Hodgk., captured in Upper Wharfedale in June; Butterfield, Naturalist, ix. pp. 53 & 54.

Stenoptycha, Zell. Butler refers this genus to the *Scopariidæ* instead of to the *Pterophoridæ*; Tr. E. Soc. 1883, p. 57.

Schistotheca rgescens, Ragonot, redescribed; Butler, *l. c.* p. 59.

Zophodia conifereua, Meyrick. ♀ noticed by him; Ent. M. M. xix. p. 255.

Ephestia elutella, Hübn.: larva destructive to biscuit; Jourdheuille, Cat. Lep. Aube, p. 225. *E. ficella*, Dougl., injurious to collections; Alphéraky, Rev. mens. Ent. i. pp. 19 & 20. *E. gnidiella*, Mill.: ravages; Penzig, L'Italia agricola, 1883 (*cf.* Bull. Ent. Ital. xv. p. 195). *E. interpunctella*, Hübn., noticed, with remarks on dry heat as a means of destroying noxious insects; Camerano, Ann. Agric. Tor. xxv. (*cf.* Bull. Ent. Ital. xv. p. 190). *E. passulella*, Barr., noticed; Porritt, Ent. M. M. xx. p. 41. *E. zeæ*, Fitch: larva destructive to lozenges in N. America; Bull. Dep. Agric. Ent. ii. p. 28.

Cateremna leucarma, Meyrick. Galls noticed by him; Ent. M. M. xix. p. 255.

Phycis adornatella, Tr. Larva described; Porritt, Ent. xvi. pp. 212 & 213.

Phycita hostilis, Steph., = *Nephopteryx rhenella*, Zinck., but is quite distinct from *Pempelia adelphella*, Rösl.; Stainton, *l. c.* p. 41. *P. nebulo*, Walsh: transformations described and figured; W. Saunders, Canad. Ent. xv. pp. 1 & 2, figs. 1 & 2.

Pempelia betulæ, Goeze: larva described; Porritt, Ent. M. M. xx. pp. 69 & 70. *P. cingillella*, Zell.: range, mode of dispersion, and hibernation of untransformed larva in cocoon noticed; Millière, Nat. Sicil. iii. pp. 34 & 35.

Crambus furcatellus, Zett., noticed; Jane Fraser, Ent. M. M. xix.

p. 188. *C. inquinatellus*, W. V.: larva described; Porritt, *l. c.* pp. 154 & 155. *C. nebulosellus*, Walk., a New Zealand species, recorded from Chili; Butler, *l. c.* p. 61. *C. ramosellus*, Zell., *nec* Doubl., renamed *epineurus*; Meyrick, Ent. M. M. xx. p. 141. *C. vulgivagellus*, Clem., and *exsiccatus*, Zell.: life-histories, &c.; Lintner, Rep. Ins. N. [illegible] pp. 12[illegible]31, figs. 30–39.

Thinasotia (*Crambus*) *impletella*, Walk., is distinct from *pleniferella*, Walk.; Meyrick, *op. cit.* xix. p. 265.

Chilo sp. Transformations noticed; the larva bores in stems of *Scirpus*: Kellicott, Canad. Ent. xv. p. 175, and Am. Nat. xvii. p. 1173. *C. phragmitellus*, Hübn.: larva described; Porritt, Ent. xvi. pp. 63 & 64.

New genera and species:—

Tylochares, Meyrick, Ent. M. M. xix. p. 256. Allied to *Dioryctria*; antennæ in ♂ with a basal tuft, maxillary palpi in ♂ with two long terminal hair-pencils; fore-wings with eleven veins, 4 and 5 and 7 and 8 being stalked; hind-wings with seven veins, 3 and 4 and 6 and 7 being stalked. Type, *Euzophera cosmiella*, Meyr.

Zophodiopsis, Fromholz, B. E. Z. xxvii. p. 12. Allied to *Zophodia*; palpi straight, slender, short, ascending, antennæ of ♂ simple. First branch of the first longitudinal nervure of the hind-wings rising about the middle; the second near the tip. Median nervure of hind-wings 4-branched. Type, *Z. hyænella*, sp. n., *ibid.* pl. ii. figs. 2–5. S. Africa (parasitic in the larval nest of *Anaphe panda*, Boisd.).

Mitothemma, Butler, Tr. E. Soc. 1883, p. 62. Allied to *Themma* (= *Tunza*, Walk.); antennæ of ♂ simple, palpi shorter, and 2nd and 3rd median branches of hind-wings emitted from a foot-stalk. Types, *M. angulipennis* and *acuminata*, p. 62, and *striata*, p. 63, spp. nn., *ibid.*, Chili.

Taseopteryx, id. *l. c.* p. 63. Allied to *Eromene*; antennæ of ♂ tapering, distinctly pectinated, and costa of fore-wings strongly arched towards the base. Type, *T. sericea*, sp. n., *l. c.* p. 64, pl. xi. fig. 3, Chili.

Eudorea lativitta, Moore, P. Z. S. 1883, p. 29, Darjiling.

Scoparia dispersa, Butler, Tr. E. Soc. 1883, p. 58, Chili.

Gesneria floricolens, id. Ent. M. M. xix. p. 180, Hawaiian Islands.

Stenoptycha zelleri, id. Tr. E. Soc. 1883, p. 57, Chili.

Salebria gypsopa, Meyrick, Ent. M. M. xix. p. 255, Adelaide.

Heosphora euryzona, id. *l. c.* p. 256, S. Australia.

Nephopteryx auranticella, Grote, Tr. Kansas Ac. viii. p. 57, and Ann. N. H. (5) xi. p. 57, New Mexico.

Pempelia italo-gallicella, Millière, Ann. Soc. L. Lyon, xxix. p. 160, pl. ii. fig. 3, Alpes-Maritimes.

Mella ragonoti, Butler, Tr. E. Soc. 1883, p. 59, Valparaiso.

Cryptoblabes divergens, id. *l. c.* p. 60, Chili.

Crambus todarius, Butler, P. Z. S. 1883, p. 173, Nilgiris; *C. dimidiatellus*, Grote, Tr. Kansas Ac. viii. p. 57, and Ann. N. H. (5) xi. p. [illegible], Washington Territory.

Chilo centrellus, Möschler, Verh. z.-b. Wien, xxxii. p. 360, pl. xviii. fig. 45, Surinam; *C. chillanicus* and *ceres*, Butler, Tr. E. Soc. 1883, p. 61, Chili.

TORTRICIDÆ.

BARRETT, C. G. Hints on the best means of rearing larvæ of *Tortricidæ*. Ent. M. M. pp. 172-176.

——. Notes on British *Tortrices* (continued). *Op. cit.* xx. pp. 132–135.

Relates to the larvæ of *Tortrix icterana*, Frön., *viburnana*, W. V., *viridana*, Linn., *forsterana*, Fabr., *heparana*, W. V., *ribeana* and *sorbiana*, Hübn., *costana*, W. V., *podana*, Scop., and *xylosteana*, Linn.

SCUDDER, S. H. The Pine Moth of Nantucket (*Retinia frustrana*). (Publications of the Massachusetts Society for the Promotion of Agriculture.) Boston: 1883, 8vo, pp. 22, col. pl.

A complete monograph on this species.

SNELLEN, P. C. T. Nieuwe of weinig bekende *Microlepidoptera* van Noord-Azie, met afbeeldingen door J. VAN LEEUWEN. Tijdschr. Ent. xxvi. pp. 181–228, pls. xi.–xiii.

26 *Tortrices*, of which 23 are new, are described and figured.

Meyrick, Tr. N. Z. Inst. xv. pp. 33–67, makes the following synonymic notes on New Zealand *Tortricidæ*:—*Capua semiferana*, Walk. (= *Sciaphila tritana*, *Tinea admotella*, and *Grapholitha abnegatana*, Walk.); *plagiatana*, Walk. (= *Conchylis recusana*, Walk., *Grapholitha* ? *xylinana*, Feld. & Rog.); *Adoxophyes conditana*, Walk. (= *Pandemis gavisana* and *Conchylis marginana*, Walk., ? *Rhacodia roscana*, F. & R., *Teras flavescens*, Butl., and *Pyrgotis porphyreana* and *Capua aoristana*, Meyr.); *Harmologa oblongana*, Walk. (= *Teras inaptana*, Walk., and *Teras canoigera*, Butl.); *H. amplexana*, Zell. (= *Cacœcia vilis*, Butl.); *Cacœcia excessana*, Walk. (= *Teras biguttana*, Walk., *Tortrix taipana*, F. & R., and *Cacœcia inana*, Butl.); *Tortrix leucaniana*, Walk. (= *Gelechia intactella* and *Teras pauculana*, Walk.); *Dipterina jactatana*, Walk. (= *Sciaphila flexivittana*, and *Pædisca privatana*, Walk., and *Grapholitha voluta*, F. & R.); *Pædisca obliquana*, Walk. (= *Teras spurcatana*, *Sciaphila transtrigana*, *turbulentana*, *Teras cuneiferana*, and ? *congestana*, Walk., and *Tortrix ropeana* and *herana*, F. & R.); and *Strepsicerus ejectana*, Walk. (= *Conchylis ligniferana* and *Sciaphila servilisana*, *saxana*, and ? *absconditana*, Walk.).

Cochylis contractana, Zell., *Retinia tessulatana*, Staud., *Eudemis amaryllana*, Mill., and *Dichrorampha acuminatana*, Zell. Transformations noticed; Constant, Ann. Soc. Ent. Fr. (6) iii. pp. 12–15.

Coquillett, Papilio, iii. pp. 99–102, describes the larvæ of *Dichelia sulfureana*, Clem., *Cenopis reticulatana*, Clem., *Teras permutana*, Dup., *Tortrix quercifoliana*, Fitch, *pallorana*, Rob., *Cacœcia semiferana*, Walk., *Loxotænia rosaceana*, Harr., and *Penthina nimbatana*, Clem., *hebesana*, Walk., *Eudemis botrana*, W. V., *Exartema* (*Eccopsis*) *permundana*, Clem., and *Lozotænia* (*Cacœcia*) *cerasivorana*, Fitch.

Abstract of Fernald's Catalogue of *Tortricidæ*; Möschler, S. E. Z. xliv. pp. 366–370. Reviewed by [Lord] Walsingham, Ent. M. M. xix. pp. 190–192.

Remarks on Meyrick's papers on Australian *Tortrices*; Fernald, Ent. M. M. xx. pp. 124–126.

Sciaphila sinuana, Steph. Habits noticed; Sang, Ent. M. M. xx. p. 166.

Cochylis zephyrana var. *maritimana*, Guen., noticed and figured; Millière, Ann. Soc. L. Lyon, xxix. pp. 166 & 167, pl. [illegible]12.

Conchylis thetis, Butl., = *Dichelia isosceliana*, Meyr.; and [illegible]? *auriceps*, Butl., belongs to *Œcophoridæ*: Meyrick, Ent. M. M. xix. pp. 265 & 266.

Eupœcilia rupicola, Curt. Habits of larva; Warren, Ent. M. M. xx. p. 17.

Penthina salicella, L., with deformed left fore-wing; Rogenhofer, SB. z.-b. Wien, xxxii. p. 35.

Œnectra fulcaria, Blanch. (?), pl. vi. fig. 4, and var. *dives* from Chili, described; Butler, Tr. E. Soc. 1883, p. 68.

Tortrix æriferana, Herr.-Schäff., noticed and figured from Basses-Alpes; Millière, *l. c.* p. 162, pl. ii. fig. 5. *T. fumiferana*, Clem.: habits, transformations and ravages described; Riley, Rep. Dep. Agric. 1883, pp. 146–149, pl. iii. fig. 3, and Packard, Bull. Dep. Agric. Ent. iii. pp. 27–29. *T. lafauriana*, Rag.: larva described; Atmore, Ent. M. M. xx. p. 113. *T. pinicolana*: ravages noticed; Wild, Ber. St. Gall. Ges. 1881–82, pp. 112 & 113. *T. shanghainana*, Walk., = *Dichelia congruana*, Walk., and should probably be referred to *Loxotænia*; Butler, Ann. N. H. (5) xi. p. 117.

Loxotænia rosaceana, Harr., *Eccopsis malana*, Cress., and *C[illegible]s. Africa pomonella*, Linn. Life-history, enemies, and remedies; The [illegible] Ins. Illin. xi. pp. 10–22.

Pædisca scudderiana, Clem. Habits noticed; it is both a gall-maker and an inquiline: Riley & Kellicott, Canad. Ent. xv. pp. 170 & 171, and Am. Nat. xvii. pp. 1069 & 1070.

Steganoptycha claypoliana, Riley, differentiated, and *Proteoteras æsculana*; Riley, Am. Nat. xvii. p. 978.

Retinia buoliana, W. V. Ravages in France; Jourdheuille, Cat. Lep. Aube, pp. 225 & 226.

Carpocapsa saltitans, Westw. Transformations and jumping habits of larva noticed; Riley, P. U. S. Nat. Mus. v. pp. 632–634, figs., and Ann. N. H. (5) xii. pp. 140–142.

Grapholitha cæcana, Schläg., recorded as new to Britain, and redescribed; Coverdale, Ent. xvi. pp. 195–197, and Ent. M. M. xx. pp. 83 & 84. *G.* (*Aspis*) *circumfluxana*, pl. xii. figs. 3 & 3*a*, p. 201, *G.* (*Pædisca*) *expressana* (♀ = *contra-signata*, Chr.), figs. 1 & 1*a*, p. 213, and *G.* (*P.*) *contrariana*, figs. 3 & 3*a*, pl. xiii. p. 218, 3 species of Christoph's, redescribed and figured by Snellen, Tidschr. Ent. xxvi.

Lobesia botrana, W. V., and larva, popularly described and figured; Saunders, Rep. E. Soc. Ont. 1882, p. 67, fig. 82.

New genera and species:—

Arctopoda, Butler, Tr. E. Soc. 1883, p. 66. Allied to *Cacœcia*. Type, *A. maculosa*, sp. n. *l. c.* p. 67, pl. xi. fig. 5, Chili.

Melaneulia, id. *l. c.* p. 70. Allied to *Eulia*. Type, *M. hecate*, sp. n., *ibid.*, Valdivia.

Eurythecta, Meyrick, Tr. N. Z. Inst. xv. p. 56. Placed after *Dipterina*; an abnormal form with only ten veins to the fore-wings. Type, *Zelotherses robusta*, Butl. (= *Steganoptycha negligens*, Butl.).

Teras longipalpana, Amur, and *affinitana*, Chingan Mountains, Snellen, Tijdschr. Ent. xxvi. pp. 184 & 185, pl. xi. figs. 1, 1*a*, 2, & 2*a*; *T. blanchardi*, fig. 6, p. 64, *walsinghami*, fig. 7, p. 65, and *fernaldi*, p. 66, Butler, Tr. E. Soc. 1883, pl. xi., Chili.

Penthina septentrionana, Möschler, S. E. Z. xliv. p. 124, Labrador.

Œnectra approximata, Butler, *l. c.* p. 67, Valparaiso.

Tortrix chrysopteris, id. *l. c.* p. 69, Chili; *T. subrufana* and *stibiana*, Snellen, *l. c.* pp. 187 & 189, pl. xi. figs. 3, 3*a*, 4, & 4*a*, Suifun.

Sciaphila leonina, Butler, *l. c.* p. 69, Valparaiso.

Dichelia exusta, id. *ibid.*, Valparaiso.

Doloploca characterana, Snellen, *l. c.* p. 191, pl. xi. figs. 5 & 5*a*, Amur.

Conchylis hedemanniana, figs. 6 & 6*a*, p. 192, *olindiana*, figs. 7 & 7*a*, Amur, p. 194, *jaculana*, figs. 8 & 8*a*, Suifun, p. 195, and *fucatana*, figs. 9 & 9*a*, Amur, p. 196, *id. l. c.* pl. xi.

Heterocrossa achroana, Meyrick, Ent. M. M. xx. p. 31, Hawaiian Islands.

Retinia frustrana, Scudder, Pine Moth of Nantucket, p. 4, plate, Nantucket.

Grapholitha ninana, Riley, Am. Nat. xvii. p. 661, Arizona; *G.* (*Sericoris*) *expeditana*, figs. 1 & 1*a*, p. 198, *G.* (*S.*) *quadrimaculana*, figs. 2 & 2*a*, Amur, p. 200, *G.* (*Semasia*) *rigidana*, figs. 4 & 4*a*, Askold, p. 203, *G.* (*S.*) *lignana*, figs. 5 & 5*a*, Irkutsk, p. 205, *G.* (*S.*) *glebana*, figs. 6 & 6*a*, Amur, p. 206, *G.* (*S.*) *lyrana*, figs. 7 & 7*a*, Irkutsk, Amur, p. 208, *G.* (*Pædisca*) *rotundana*, figs. 8 & 8*a*, Askold, Irkutsk, p. 209, *G.* (*P.*) *acceptana*, figs. 9 & 9*a*, pl. xii., Amur, p. 211, *G.* (*P.*) *subcorticana*, figs. 2 & 2*a*, Suifun, Amur, p. 215, *G.* (*P.*) *perangustana*, figs. 4 & 4*a*, Amur, p. 220, *G. lepidulana*, figs. 5 & 5*a*, Irkutsk, p. 221, *nigro-striana*, figs. 6 & 6*a*, Amur, p. 223, *G. fimana*, figs. 7 & 7*a*, Askold, p. 225, and *G.* (*Tmetocera*) *prognathana*, fig. 8, pl. xiii., Chingan Mountains, p. 227, Snellen, *l. c.*

Sericoris wilkinsoni, p. 71, *cauquenensis*, *erebina*, and *eurydice*, p. 72, Butler, *l. c.*, Chili.

Phtheochroa inexacta, Butler, *l. c.* p. 71, Chili.

Eudemis kreithneriana, Hornig, Verh. z.-b. Wien, xxxii. p. 279, Austria (*cf.* also Rogenhofer, SB. z.-b. Wien. xxxii. pp. 41 & 42).

Tineidæ.

Brunn, A. E. *Tineidæ* infesting Apple-trees at Ithaca (New York). Rep. Cornell Univ. Stat. ii. pp. 148–162, pls. v. & vi.

The transformations of the following species are described and figured:—*Lithocolletis cratægella*, *Aspidisca splendoriferella*, *Tischeria malifoliella*, *Bucculatrix pomifoliella*, Clem., and *Ornix prunivorella*, Chamb.

Chambers, V. T. The Classification of the *Tineidæ*. Psyche, iv. pp. 71–74.

After replying to criticisms of Grote and Lord Walsingham, the

writer sets forth his own views in a tentative manner. The families he suggests are as follows :—(1) Including *Tineidæ* ; (2) including *Gracilariidæ*, *Lithocolletidæ* and *Phyllocnistis* ; (3) including *Nepticulidæ* ; (4) *Hyponomeutidæ*, *Gelechiidæ*, *Glyphipterygidæ*, *Coleophoridæ*, and part of *Elachistidæ* ; (5) *Tischeria* ; (6) *Cemiostoma*. On the remaining groups no definite opinions are expressed.

Curò, C. I. Tinee italiane appartenenti alle famiglie delle *Lithocolletidæ*, *Lyonetidæ*, e *Nepticulidæ*. Atti Soc. Mod. xvi. p. 1–16.

Includes notices of larvæ, times of appearance, and localities.

Meyrick, E. On the Classification of some Families of the *Tineina*. Tr. E. Soc. 1883, pp. 119–131.

The writer defines the following 7 families, almost entirely by neuration : *Gelechiidæ*, *Chimabacchidæ*, *Depressariidæ*, *Cryptolechiidæ*, *Œcophoridæ*, *Dasyceridæ*, and *Glyphipterygidæ*. The genera referable to these families are indicated, and their evolution and geographical distribution discussed.

——. Descriptions of Australian *Microlepidoptera*. VIII., IX. *Œcophoridæ*. P. Linn. Soc. N. S. W. vii. pp. 415–547, & viii. pp. 320–383.

The *Œcophoridæ* are very richly represented in Australia ; the author possesses 450 species ; and the total number inhabiting Australia alone cannot be less than 2000. A table of about 70 genera (mostly new) is given ; and 176 species belonging to the first 34 genera are discussed in the two papers already published. It is impossible to include the characters of these new genera in the Zool. Rec. In the more extensive genera the species are tabulated.

——. Descriptions of New Zealand *Microlepidoptera*. III. *Œcophoridæ*. N. Z. J. Sci. i. pp. 522–525.

Their direct affinity with Australian forms is very slight. Several new genera and many new species are described.

Murtfeldt, [Miss] M. E. Notes on the *Tineidæ* of North America, by Lord Walsingham (from Tr. Am. Ent. Soc. x. ; vide *infrà*). Canad. Ent. xv. pp. 93–96.

Includes various comments by V. T. Chambers.

Sorhagen, L. Beiträge zur Auffindung und Bestimmung der Raupen der Microlepidopteren. B. E. Z. xxvii. pp. 1–8.

Relates exclusively to *Tineina*. Two useful tables are appended :—(1) Sketch of the larvæ according to the structure of the legs, and (2) sketch of leaf-mining larvæ according to the number and structure of the legs, and also according to their habits.

Walsingham [Lord]. Notes on *Tineidæ* of North America. Tr. Am. Ent. Sc. x. pp. 165–204.

The following known species are noticed :—*Choreutis bjerkandrella*, Thunb. ; *Acrolophus* spp. ; *A. agrotipennella*, Grote, probably = *scardina*, Zell., and *popeanella*, Clem. ; *Acrolophus*, Poey, and *Anaphora*, Clem., probably = *Pinaris*, Hübn. ; *Blabophanes dorsistrigella*, Clem. (= *Tinea subjunctella*, Walk.) ; *B. ferruginella*, Hübn. (= *T. crocicapitella*, Clem.);

Tinea biflavimaculella, Clem. (= *T. insignisella*, Walk. ; ? = *T. rusticella*, Hübn., var. *spilotella*, Tengstr.) ; *T. pellionella*, Linn. (= *carnariella*, Clem., and *griseella*, Chamb.); *T. granella*, Linn. (= *varietella*, Clem.) ; *T. fuscipunctella*, Haw. (? = *Œcophora frigidella*, Pack.) ; *Eudarcia simulatricella*, Clem. (= *Tinea cæmetariella*, Chamb.) ; *Scardia anatomella*, Grote ; *Incurvaria acerifoliella*, Fitch (= *Tinea iridella*, Chamb.) ; *Lampronia oregonella* and *tripunctella*, Wals., likewise belong to *Incurvaria* ; *Adela ridingsella*, Clem. (= *A. schlageri*, Zell., and *Dicte coruscifasciella*, Chamb.) ; *Acrolepia dorsimaculella*, Chamb. (= *Heribeia incertella*, Chamb.) ; *Epigraphia packardella*, Clem. (= *eruditella*, Grote) ; *Depressaria applana*, Fabr. (= *Gelechia clemensella*, Chamb.) ; *D. arenella*, W. V. ; *Cryptolechia nubeculosa*, Zell. (= *Harpalyce canusella*, Chamb.) ; *C. quercicella*, Clem. (= *faginella* and *cressonella*, Chamb., and ? *obsoletella*, Zell.) ; *C. cretacea*, Zell. (? = *Harpalyce albella*, Chamb.); *Gelechia quinella*, Zell. (= *cercerisella*, Chamb.) ; *G. petasitis*, Pfaff.; *G.* (*Bryotropha* ?) *bosquella*, Chamb. ; *G.* (*Lita*) *vagella*, Walk. (= *Depressaria fusco-ochrella*, Chamb., and *G.* (*L.*) *liturosella*, Zell.) ; *G.* (*L.*?) *conclusella*, Walk. (= *G. crescentifasciella* and *griseifasciella*, Chamb.) ; *G.* (*Ergatis*) *rosco-suffusella*, Clem. (= *G. bellella*, Walk.) ; *G.* (*E.*) *rubidella*, Clem. (= *G. rubensella*, Chamb.) ; *G.* (*Anacampsis*) *absconditella*, Walk. (= *G. palpannulella*, Chamb.) ; *G. atributella*, Walk. (= *Evagora difficilisella*, Chamb.) ; *G.* (*E.*) *apicitripunctella* (= *G.* (*Teleia* ?) *gilviscopella*, Zell., and varr. (?) *G. dorsivittella*, Zell., and *cristateila*, Chamb.) ; *G.* (*Tachyptilia*) *rhoifructella*, Clem. (= *G. ochreocostella*, Chamb., and ? *G.* (*T.*) *consonella*, Zell.) ; *G.* (*Trichotaphe*) *ochripalpella*, Clem. (= *G.* (*T.*) *alacella*, Clem., and *G. goodelliella*, Chamb.); *G.* (*T.*) *juncidella*, Clem. (= *G. pallipalpis*, Walk., and *dubitella*, Chamb.) ; *G.* (*T.*?) *refusella*, Chamb. (= *Menesta rufescens*, Wals., *olim*) ; *G.* (*Malacotricha*) *bilobella*, Zell. (? = *Begoe costaluteella*, Chamb.) ; *Hypsilophus pometellus*, Harr. (= *H. punciguttellus* and *flavivittellus*, Clem., *Chatochilus contubernatellus*, Fitch, *H. reedella*, *ruderella*, and *quercipomonella*, Chamb., and ? *Dichomeris ligulella*, Hübn.) ; *Nothris setosella*, Clem. (= *Hypsilophus eupatoriellus*, Chamb., and *N. dolabella*, Zell.) ; *Helice pallidochrella*, Chamb. (= *Gelechia gleditschiella*, Chamb.) ; *Pigritia laticapitella*, Clem. (= *Blastobasis* (?) *aufugella*, Zell., and *Dryope murtfeldtella*, Chamb., pt.) ; *Blastobasis glandulella*, Riley (= *nubilella*, Zell.) ; *Gracilaria swederella*, Thunb. (= *alchimiella*, Wocke, *superbifrontella*, Clem., *packardella*, Chamb., and *elegantella*, Frey) ; *G. coroniella*, Clem. (?), *elongella*, Linn., var. (?), *robiniella*, Clem. (= *Parectopa lespedezifoliella*, Clem., and *G. mirabilis*, Frey) ; *Ornix anglicella*, Staint. ; *O. prunivorella*, Chamb. (? = *Lithocolletis geminatella*, Pack.) ; *Coleophora leucochrysella*, Clem. (= *argentella* and *argentialbella*, Chamb.); *C. malivorella*, Riley (= *multipulvella*, Chamb.); *Laverna* (?) *eloisella*, Clem. (= *L.* (?) *œnotherella*, Chamb., and *Phyllocnistis magnatella*, Zell.) ; *L. subbistrigella*, Wocke, *decorella*, Steph. (? = *unifasciella*, Chamb.); *luciferella*, Clem. (= *cephalanthiella*, Chamb.) ; *Wilsonia brevivittella*, Clem. (= *Laverna œnotherivorella* and *œnotheriseminella*, Chamb.) ; *Stilbosis tesquella*, Clem. (= *Laverna* (?) *quinquecristatella*, Chamb.); *Walshia amorphella*, Clem. (= *Laverna miscicolorella*, Chamb.) ;

Schreckensteinia festaliella, Hübn. (allied to *Lithariopteryx abroniella*, Chamb.) ; *Æsyle fasciella*, Chamb. (= *Gracilaria 5-notella*, Chamb.) ; *Lithocolletis mariella*, Chamb. (= *alniella*, pt., and *trifasciella*, Chamb.), *trifasciella*, Haw., *desmodiella*, Clem. (= *gregariella*, Murtf.), *pomifoliella*, Zell. (= *crataegella*, Clem.) ; *Tischeria tinctoriella*, Chamb. (?) ; *Bucculatrix trifasciella*, Clem. (= *obscuro-fasciella*, Chamb.), and *pomifoliella*, Clem. (= *B. pomonella* and *Lithocolletis curvilineatella*, Pack.).

Acrolepia eglanteriella, Mann, *Depressaria subpropinquella*, Staud. (var. *rhodochrella*, Herr.-Schäff.), *Gelechia basigutella*, Hein., *cytisella*, Treitschke, *Telia myricariella*, Frey, *Mesophleps trinotellus*, Herr.-Schäff., *Nothris asinella*, Hübn., *Chauliodus aquidentellus*, Hofm., *Pyroderces argyrogrammos*, Zell. Transformations noticed ; Constant, Ann. Soc. Ent. Fr. (6) iii. pp. 15–20.

Anarsia lineatella, Zell., *Bucculatrix pomifoliella*, Clem., and *Coleophora malicorella*, Riley. Habits, transformations, parasites, &c., discussed ; Lintner, Rep. Ins. N. York, i. pp. 151–167, figs. 40–46.

Tinea laricinella, *clerkella*, and *malinella*, noticed as destructive insects; Wild, Ber. St. Gall. Ges. 1881–82, pp. 111–116.

Diurnea fagella, Fabr., dark var. noticed ; Geldart, Ent. xvi. p. 277.

Semioscopis avellanella, Hübn. Larva described ; J. H. Wood, Ent. M. M. xx. p. 165.

Solenobia triquetella, Treitschke, noticed, Jourdheuille, Cat. Lep. Aube, p. 227.

Scardia polypori, Esp., recorded as new to Finland ; Sahlberg, Medd. Soc. Fenn. ix. p. 155.

Tinea sarcitella, Fabr. Larva noticed ; Sci. Goss. xix. p. 21.

Pronuba necessary to the fertilization of *Yucca* ; oviposition described: Riley, P. Am. Ass. xxxi. pp. 467 & 468, and Am. Nat. xvii. p. 197.

Adela irroratella, Christoph, = *griseella*, Walsingh.; Snellen, Tijdschr. Ent. xxvi. p. 183.

Monograph of Swedish *Micropterygidæ* (*Eriocephala*, 5, and *Micropteryx*, 4) ; Wallengren, Ent. Tidskr. iv. pp. 213–216.

Hyponomeuta rorella, Hübn. Habits, as recorded by different entomologists, discussed ; Stainton, Ent. M. M. xx. pp. 136 & 137.

Azinis hilarella, Walk., noticed from the Hawaiian Islands; Butler, Ent. M. M. xix. p. 180.

Plutella cruciferarum, Linn. : transformations, habits, &c., noticed ; Riley, Rep. Dep. Agric. 1883, pp. 129 & 130, pls. i. figs. 6 & 6*a*, & xi. figs. 5*a*, *b*. On its occurrence in Australia ; Meyrick & Macleay, P. Linn. Soc. N. S. W. viii. p. 282, and N. Z. J. Sci. i. pp. 486, 533, & 534.

Coquillett describes the larvæ of *Depressaria pulvipennella*, *atro-dorsella*, Clem., *grotella*, Rob., *hilarella*, Zell., *Gelechia discæcella*, Chamb., *agrimoniella* and *rhoifructella*, Clem., and *tristrigella*, Walsingh. ; Papilio, iii. pp. 97–99.

Depressaria discipunctella, Herr-Schäff. : occurrence in Germany; Martini & Saalmüller, Ent. Nachr. ix. pp. 15 & 55. *D. heracliana*, De Geer (= *ontariella*, Beth.) : larva described ; H. Edwards, Papilio, iii. pp. 24 & 25. *D. indecora* and *lactea*, Butl., are sexes; Meyrick, Ent. M. M.

xx. p. 32. *D.* sp. from the Hawaiian Islands noticed; Butler, *l. c.* p. 180.

Gelechia ocellatella, Staint., = *instabilella*, Dougl.; variation, and confusion with *G. plaginella*, sp. n., discussed: Stainton, *op. cit.* xix. pp. 251–253. *G. velocella*, Dup., var. or sp. n. *brunnea* from Saltdalen described; Schøyen, Tromsö Mus. Aarsh. v. [1882]. pp. 53 & 54. *G. formosella* and *cinerella*, Murtfeldt (preoccupied), renamed *vernella* and *inconspicuella* respectively; Murtfeldt, Canad. Ent. xv. p. 139.

Cryptolechia schlagenella, Zell. Transformations described; Packard, Bull. Dep. Agric. Ent. iii. pp. 25 & 26.

Safra bogotatella, Walk., = *Lindera tessellatella*, Blanch.; Butler, Tr. E. Soc. 1883, p. 84.

Palparia rectiosella, Walk., = *P. aurigena* and *confectella*, Walk.; and *P. uncinella*, Zell., = *Tortricopsis rosabella*, Newm.: Meyrick, P. Linn. Soc. N. S. W. vii. pp. 430, 431, & 437.

Œcophora dichroella, Zell., = *divisella*, Walk. (p. 685, *nec* 677); *Œ. irruptella*, Zell., *nec* Walk., *trijugella*, Zell. (distinct from *bracteatella*, Walk.), *griseicostella*, Zell. (= *productella*, Walk.), and *Conchylis* (?) *auriceps*, Butl., belong to *Philobota*: Meyrick, Ent. M. M. xix. pp. 265 & 266.

Acrolepia citri, Mill. Ravages in S. Europe; Laugier, C.R. xcvii. p. 760, and Penzig, L'Italia agricola, 1883 (*cf.* Bull. Ent. Ital. xv. p. 195).

Gracilaria syringella, Fabr. Variety described; Sang, Ent. xvi. pp. 262 & 263.

Coleophora, sp. n. from the Aube, near *coronillella* and *gallipennella*, described but not named; Jourdheuille, Cat. Lep. Aube, pp. 227 & 228. *C. lixella*, Zell.: note on young larvæ; Warren, Ent. M. M. xx. p. 18. *C. salinella* and *tengstromella* noticed; Machin, Ent. xvi. pp. 18 & 19. *C. vibicigerella*, Zell., recorded as new to Britain; Stainton & Machin, Ent. M. M. xx. pp. 165 & 166.

Idiostoma americella, Walsingh., = *Metamorpha miraculosa*, Frey & Boll.; Walsingham, Canad. Ent. xv. p. 139.

Chauliodus iniquellus, Wocke. Larva described and figured, with imago; Millière, Ann. Soc. L. Lyon, xxix. pp. 168 & 169, pl. iii. figs. 4–6.

Elachista sp. n. (?) noticed; Sang, Ent. xvi. p. 163.

Lithocolletis. Monograph of Scandinavian species (34); Wallengren, *l. c.* pp. 195–212.

Lithocolletis gregariella, Murtf., ? = *desmodiella*, Chamb.; Murtfeldt, Canad. Ent. xv. p. 139.

Nepticula. Hibernation of larvæ; Warren, *l. c.* pp. 17 & 18.

New genera and species:—

Eulepiste, Walsingham, Tr. Am. Ent. Soc. x. p. 169. Has affinities with *Acrolophus* and *Acrolepia*. Type, *E. cressonii*, sp. n., *ibid.*, Texas.

Tacorhychia, Butler, Tr. E. Soc. 1883, p. 74. *Hyponomeutidæ*; form of wings as in *Tinea arcuatella*. Type, *T. cinerea*, sp. n., *l. c.* p. 75, Chili.

Hyperskeles, id. *l. c.* p. 78. Allied to *Œcophora*. Type, *H. choreutidea*, sp. n., *l. c.* p. 79, Valdivia.

Callistenoma, Butler, *l. c.* p. 79. Allied to *Stenoma*; palpi with 2nd joint broad, compressed, and fringed below. Type, *Cryptolechia ustimacula*, Zell. (var. *zelleri* from Valparaiso described and figured, p. 80, pl. xi. figs. 8 & 8*a*).

Pachyphœnix, id. *l. c.* p. 81. Allied to *Tortricopsis*. Type, *P. sanguinea*, sp. n., *ibid.* pl. xi. figs. 13 & 13*a*, Chili.

Palæphatus, id. *l. c.* p. 82. Form of *Machimia*. Type, *P. falsus*, sp. n., *ibid.* pl. xi. fig. 11, Chili.

Pisinidea, id. *l. c.* p. 83. Allied to *Cryptolechia* and *Tortricopsis*. Type, *P. viridis*, sp. n., *ibid.* pl. xi. fig. 10, Chili.

Ithutomus, id. *l. c.* p. 84. Allied to *Psecadia*. Type, *I. formosus*, sp. n., *l. c.* p. 85, Valdivia.

Thyrocopa, Meyrick, Ent. M. M. xx. p. 32. An aberrant group of *Gelechiidæ*. Type, *Depressaria usitata*, Butl.

Synomotis, id. *l. c.* p. 33. Allied to last. Type, *S. epicapna*, sp. n., *ibid.*, Hawaiian Islands.

Automola, id. *l. c.* p. 34. Allied to last; fore-wings with only 11 veins. Type, *A. pelodes*, sp. n., *ibid.*, Hawaiian Islands.

Diplosara, id. *l. c.* p. 35. An aberrant form of *Gelechiidæ*. Type, *Scardia lignivora*, Butl.

Enchocrates, id. P. Linn. Soc. N. S. W. vii. pp. 425 & 442. Type, *E. glaucopis*, sp. n., *l. c.* p. 443, Sydney.

Eclecta, id. *l. c.* pp. 420 & 444. Type, *E. aurorella*, sp. n., *l. c.* p. 445, Sydney.

Lepidotarsa, id. *l. c.* pp. 420 & 446. Types, *L. chrysopora* and *alphitella*, spp. nn., *l. c.* p. 447, Paramatta, &c.

Eochroa, id. *l. c.* pp. 421 & 448. To include *Lophoderus latiferanus*, Walk. (= *Œcophora semifusella* and *Cryptolechia puderinella*, Walk.), *C. inclusella* and *dejunctella*, Walk., *Œ. matutinella*, Walk. (= *C. marginella*, Walk.), *C. acutella*, Walk., and *E. callianassa*, S. Australia, p. 450, *pulcerulenta*, Blue Mountains, Sydney, p. 454, *aclea*, Tasmania, p. 456, and *protophoes*, Sydney, &c., p. 457, spp. nn.

Euphiltra, id. *l. c.* pp. 425 & 458. Type, *E. eroticella*, sp. n., *l. c.* p. 458, Paramatta.

Zonopetala, id. *l. c.* pp. 421 & 459. To include *Œcophora divisella*, Walk., *Conchylis decisana*, Walk. (= *Œ. retractella* and *mediella*, Walk.), *Cryptolechia quadripustulella*, Walk., and *Z. clerota*, p. 461, *glauconephela*, p. 462, and *melanoma*, Sydney, p. 465, spp. nn.

Heliocausta, id. *l. c.* pp. 442 & 466. To include *Cryptolechia incarnatella*, *inceptella*, *triphænatella* (= *œcophorella*, Walk.), and *H. severa*, Sydney, p. 470, *limbata*, Melbourne, p. 471, *hemiscia*, Paramatta, p. 472, *pelosticta*, New South Wales, p. 473, *elæodes*, Adelaide, p. 474, *hemiteles* (= *Œcophora semiruptella*, Walk., coll., *nec* descr.), Sydney, Melbourne, p. 475, *phylarcha*, Sydney, p. 476, *paralyrgis*, Adelaide, p. 479, *protoxantha*, Queensland, p. 480, *parthenopa*, p. 481, *euselma*, Adelaide, p. 482, and *rufo-grisea*, Sydney, p. 483, spp. nn.

Euchætis, id. *l. c.* pp. 421 & 484. To include *E. habrocosma*, Sydney, and *metallota*, Australia, spp. nn., *l. c.* pp. 484 & 486.

Euryplaca, id. *l. c.* pp. 422 & 487. To include *E. ocellifera*, Sydney,

Tasmania, and *demotica*, Blue Mountains, Melbourne, spp. nn., *l. c.* pp. 489 & 490.

Atelosticha, Meyrick, *l. c.* pp. 419 & 490. Type, *A. phædrella*, sp. n., *l. c.* p. 491, Sydney, &c.

Nymphostola, id. *l. c.* pp. 424 & 491. Type, *Cryptolechia galactina*, Feld. & Rog.

Proteodes, id. *l. c.* pp. 424 & 492. Type, *Cryptolechia carnifex*, Butl. (= *C. rufo-sparsa*, Butl.).

Hoplitica, id. *l. c.* pp. 424 & 493. To include *Depressaria sobriella*, *absumptella*, Walk., *Cryptolechia carnea*, *repandula*, *pudica*, Zell., and *H. neochlora*, p. 495, *myodes*, p. 496, *sericata*, p. 497, *leucerythra*, p. 501, *costimacula*, p. 502, *rufa*, p. 504, *cænosa*, p. 506, and *cholodella*, p. 507, spp. nn., Australia.

Eulechria, id. *l. c.* pp. 424 & 508. To include *Cryptolechia griseola*, Zell., *Depressaria melesella*, Newm., *D. convictella*, *Œcophora triferella*, *Cryptolechia transversella*, *Pseeadia dolosella*, *Gelechia xylopterella*, *siccella*, *scopariella*, Walk., and *E. nephelopa*, p. 513, *cremnodes*, p. 514, *zophoessa*, p. 515, *episema*, p. 517, *examinis*, *pallidella*, p. 519, *pantelella*, p. 520, *leptobela*, p. 521, *puellaris*, p. 522, *achalinella*, p. 523, *brachypepla*, p. 524, *epicausta*, p. 525, *chlorella*, p. 526, *variegata*, p. 528, *hemiphanes*, p. 529, *leucopelta*, p. 530, *pœcilella*, p. 531, *habrophanes*, p. 532, *lividella*, p. 533, *philotherma*, p. 534, *brontomorpha*, p. 535, *calotropha*, p. 536, *philostaura*, p. 537, *amaura*, p. 538, *adoxella*, Australia, p. 540, *plotinella*, New Zealand, p. 541, *paurogramma*, Tasmania, p. 542, *cimmeriella*, p. 543, *grammatica*, p. 545, *perdita*, p. 547, vii.; *E. leucophanes*, Australia, p. 320, *arodes*, Tasmania, p. 321, *tanyscia*, *ambrophora*, p. 322, *sciophanes*, p. 323, and *acerea*, Australia, p. 324, *op. cit.* viii., spp. nn.

Atomotricha, id. *op. cit.* vii. p. 423, & viii. p. 324. Type, *A. ommatias*, sp. n., *op. cit.* viii. p. 325, and N. Z. J. Sci. i. p. 522, New Zealand.

Brachysara, id. P. Linn. Soc. N. S. W. vii. p. 424, & viii. p. 325. Type, *Œcophora sordida*, Butl.

Leistarcha, id. *op. cit.* vii. p. 422, & viii. p. 325. Type, *L. iobola*, sp. n., *op. cit.* viii. p. 526, New South Wales.

Œnochroa, id. *op. cit.* vii. p. 423, & viii. p. 527. To include *Gelechia lactella*, Walk., and *Œ. endochlera*, S. Australia, and *iobaphes*, New South Wales, spp. nn., *op. cit.* viii. pp. 329 & 330.

Machetis, id. *op. cit.* vii. p. 420, & viii. p. 331. Type, *M. aphrobola*, sp. n., *op. cit.* viii. p. 331, Sydney, &c.

Placocosma, id. *op. cit.* vii. p. 423, & viii. p. 332. Types, *P. hephæstea* and *anthopetala*, spp. nn., *op. cit.* viii. p. 333, Sydney.

Allodoxa, id. *op. cit.* vii. p. 419. [It is subsequently withdrawn as probably belonging to the *Glyphipterygidæ*, and no species belonging to it is indicated or described; *op. cit.* viii. p. 334.]

Petalanthes, id. *op. cit.* vii. p. 421, & viii. p. 335. Types, *P. sphærophora*, p. 335, *hexastera*, p. 336, and *periclyta*, p. 337, spp. nn., *op. cit.* viii., Australia.

Linosticha, id. *op. cit.* vii. p. 424, & viii. p. 338. Types, *L. erythropa*, Sydney, and *canephora*, S. Australia, Tasmania, spp. nn., *op. cit.* viii. p. 339.

Phriconyma, Meyrick. *op. cit.* vii. p. 424, & viii. p. 340. Type, *P. lucifuga*, sp. n., *op. cit.* viii. p. 340; New South Wales.

Locheutis, id. *op. cit.* viii. p. 341. Types, *L. philochora*, p. 342, *desmophora* and *ancyrota*, p. 343, spp. nn., *l. c.*, Tasmania.

Ioptera, id. *op. cit.* vii. p. 424, & viii. p. 344. Type, *I. aristogona*, sp. n., *op. cit.* viii. p. 345, Sydney.

Macronemata, id. *op. cit.* vii. p. 424, & viii. p. 345. Types, *M. lopelictus*, Queensland, and *elaphia*, Tasmania, spp. nn., *op. cit.* viii. p. 346.

Phlœopola, id. *op. cit.* vii. p. 423, & viii. p. 347. To include *Cryptolechia turbatella*, *Œcophora confusella*, Walk., and *P. dinocosma* (also N. Z. J. Sci. i. p. 522), New Zealand, *asbolœa*, p. 349, *semocausta*, p. 350, *helica*, p. 351, *psephophora*, Tasmania, p. 352, *synchyta*, Sydney, p. 355, *banausa*, Australia, Tasmania, p. 356, *exarcha*, South Australia, p. 357, *lithoglypta*, p. 358, and *melanodelta*, Sydney, &c., p. 359, spp. nn., *op. cit.* viii.

Sphyrelata, id. *op. cit.* vii. p. 423, & viii. p. 360. To include *Cryptolechia indecorella*, Walk. (= *Œcophora amotella*, Walk.), and *S. melanoleuca* and *S.* (?) *ochrophœa*, spp. nn., *op. cit.* viii. pp. 360 & 361.

Hieropola, id. *op. cit.* vii. p. 424, & viii. p. 363. Type, *Tisobarica jucundella*, Walk.

Piloprepes, id. *op. cit.* vii. p. 423, & viii. p. 365. Type, *Œcophora æmulella*, Walk.; add *P.* (?) *iriodes*, sp. n., *op. cit.* viii. p. 365, Sydney.

Trachypepla, id. *op. cit.* vii. p. 423, & viii. p. 367. To include *Gelechia conspicuella*, Walk., and *T. leucoplanetis*, p. 368, *euryleucota*, *spartodeta*, *nyctopis*, *galaxias*, p. 369, *protochlora*, *aspidephora*, *anastrella*, *lichenodes*, New Zealand (*cf.* also N. Z. J. Sci. i, pp. 522 & 523), and *melanoptila*, Sydney, p. 370, spp. nn., *op. cit.* viii.

Mesolecta, id. *op. cit.* viii. p. 371. Type, *M. psacasta*, sp. n., *ibid.*, S. Australia.

Nephogenes, id. *op. cit.* vii. p. 423, & viii. p. 372. To include *Cryptolechia fœdatella*, Walk., and *N. egelida*, *ennephela*, p. 374, *mathematica*, p. 375, *orescoa*, New South Wales, p. 376, *protorthra*, Tasmania, p. 379, *philopsamma*, p. 379, *æthalea*, South Australia, *microschema*, Tasmania, p. 380, *apora*, Queensland, p. 381, spp. nn., *op. cit.* viii.

Autidica, id. *op. cit.* vii. p. 422, & viii. p. 382. Types, *A. oriomorpha*, Melbourne, &c., and *barysoma*, Tasmania, spp. nn., *op. cit.* viii. pp. 382 & 383.

Philobata, id. *op. cit.* vii. p. 422. Type, *Conchylis* (?) *auriceps*, Butl. (*cf.* Meyrick, Ent. M. M. xix. p. 266).

Gymnobathra, id. P. Linn. Soc. N. S. W. vii. p. 425. To include *G. sarcoxantha*, *tholodella*, *calliploca*, *hyetodes*, p. 523, and *philadelpha*, p. 524, spp. nn., *id.* N. Z. J. Sci. i., New Zealand.

Semiocosma, id. P. Linn. Soc. N. S. W. vii. p. 424. To include *S. epiphanes*, *prasophyta*, and *austera*, spp. nn., *id.* N. Z. J. Sci. i. p. 523, New Zealand.

Aochleta, id. P. Linn. Soc. N. S. W. vii. p. 425. Type, *A. psychra*, sp. n., *id.* N. Z. J. Sci. i. p. 523, New Zealand.

Thamnosara, id. N. Z. J. Sci. i. p. 523. Allied to *Gymnobathra*; but second joint of palpi with a large square tuft beneath. Type, *T. chirista*, sp. n., *ibid.*, New Zealand.

Cremnogenes, Meyrick,, *l. c.* p. 525. Allied to *Œcophora*; but antennæ in ♂ with ciliations whorled, or closely set over entire surface. To include *C. oxyina* and *aphrontis*, spp. nn., *l. c.* p. 525, New Zealand.

Lathicrossa, id. *l. c.* p. 523. Allied to *Gymnobathra*; antennæ very shortly ciliated, ♂ 1 thorax crested. Type, *L. leucocentra*, sp. n., *ibid.*, New Zealand.

The following apparently new genera are included by Meyrick in his table of genera of *Œcophoridæ* (P. Linn. Soc. N. S. W. vii.), but at present without full descriptions, or indications of types:—*Thalerotricha*, p. 419, *Thyrsopala*, *Protomacha*, *Atheropla*, *Saropla*, *Ceranica*, *Crepidosceles*, *Epipyrga*, p. 420, *Eulachna*, *Compsotropha*, *Aristeis*, *Orophia*, *Peltophora*, p. 421, *Eriodyta*, *Oxythecta*, *Macharitis*, *Haplodyta*, *Leistomorpha*, *Philonympha*, *Heterozyga*, p. 422, *Cæsyra*, *Microbela*, *Brachynemata*, p. 423, *Gonionota*, p. 424, *Leptocroca*, *Crossophora*, *Satrapia*, *Macrobathra*, *Ochlogenes*, and *Disselia*, p. 425.

Atychia triphænoides, Butler, Tr. E. Soc, 1883, p. 73, Chili.

Acrolophus (?) *simulatus*, Walsingham, Tr. Am. Ent. Soc. x. p. 168, Texas.

Chimabacche (?) *haustellata*, id. *l. c.* p. 173, N. America.

Semioscopis inornata and *allenella*, id. *l. c.* p. 174, N. America.

Nemophora fasciolata, Butler, *l. c.* p. 74, Valdivia.

Micropteryx auricyanea, Walsingham, *l. c.* p. 204, N. America.

Plutella haasi, Staudinger, S. E. Z. xliv. p. 183, Dovrefjeld.

Orthotelia increta, Butler, *l. c.* p. 75, Valdivia.

Depressaria edmondsi, id. *l. c.* p. 76, Chili; *D. swinhoei*, id. P. Z. S. 1883, p. 174, Mhow; *D. fulva*, Walsingham, *l. c.* p. 175, N. America.

Gelechia plantaginella, Stainton, Ent. M. M. xix. p. 253, England, Ireland; *G. fulminella*, Millière, Ann. Soc. L. Lyon, xxix. p. 161, pl. ii. fig. 4, Alpes-Maritimes; *G. saltenella*, Schøyen, Tromsö Mus. Aarsh. v. p. 55, Saltdalen; *G. abietisella*, Riley, Rep. Dep. Agric. 1883, p. 150, pls. iii. fig. 2, & xiii. figs. 7 & 7*a*, *b*, Rhode Island; *G. ocelligera*, Butler, Tr. E. Soc. 1883, p. 77, Chili; *G. flavicorporella*, N. America, p. 177, *G.* (*Telia*) *oronella*, Orono, Maine, p. 179, *G.* (*Pœcilia*) *inscripta*, Texas, p. 180, *G.* (*Anacampsis*) *tristrigella*, p. 181, *G.* (*Tricotaphe*) *purpureo-fusca*, and *G.* (*T.* ?) *inserrata*, N. America, p. 184, Walsingham, *l. c.*

Doryphora hornigi, Staudinger, S. E. Z. xliv. p. 184, Vienna.

Cryptolechia phœnissa, Butler, *l. c.* p. 81, pl. xv. figs. 12 & 12*a*, Chili; *C. surinamella*, Möschler, Verh. z.-b. Wien. xxxii. p. 360, pl. xviii. fig. 46, Surinam.

Agriocoma mimulina, Butler, *l. c.* p. 83, pl. xi. figs. 9 & 9*a*, Valparaiso.

Hypsilophus roscocostellus, St. Louis, and *bipunctellus*, Orono, Maine?, Walsingham, *l. c.* pp. 185 & 186; *H. robustus*, Butler, P. Z. S. 1883, p. 174, Kurrachee.

Nothris trinotella, Coquillett, Papilio, iii. pp. 81, 102, & 103, Illinois.

Topeutis venosa, Butler, Tr. E. Soc. 1883, p. 77, Valparaiso.

Carposina crescentella, Walsingham, *l. c.* p. 189, N. America.

Pleurota protasella, Staudinger, *l. c.* p. 184, Granada.

Protasis glitzella, id. *l. c.* p. 185, Granada.

Lecithocera (?) *flavistrigella*, Walsingham, *l. c.* p. 189, N. America.

Palparia hesperidella, Blue Mountains, Sydney, p. 429, *thalamia*, Blue Mountains, *conephella*, Sydney, Brisbane, p. 432, *micrastrella*, Paramatta, p. 433, *euryphanella*, Tasmania, Gippsland, p. 435, *aulacois*, New South Wales, p. 438, *falcifera*, Paramatta, p. 440, and *hird-*, Sydney, p. 441, Meyrick, P. Linn. Soc. N. S. W. vii.

Œcophora minnetta, Butler, *l. c.* p. 78, Chili; *Œ. scholæa*, *letharga*, *chloritis*, *epimylia*, *hemimochla*, *phegophylla*, *oporæa*, *horæa*, *apanthes*, *anæma*, *macarella*, p. 524, *homodoxa*, *siderodeta*, *hoplodesma*, and *chrysogramma*, p. 525, Meyrick, N. Z. J. Sci. i., New Zealand.

Œgoconia latipennis, Walsingham, *l. c.* p. 190, N. America.

Endrosis braziliensis, Moore, P. Liverp. Soc. xxxvii. p. 257 (transformations described; E. D. Jones, *tom. cit.* pp. 257–259), Brazil.

Argyresthia walsinghamella, Millière, *l. c.* p. 159, pl. ii. fig. 1, Cannes; *A. conspersa*, Butler, *l. c.* p. 85, Chili; *A. subreticulata*, Walsingham, *l. c.* p. 173, N. America.

Cosmopteryx fernaldella and *lespedezæ*, id. *l. c.* pp. 197 & 198, N. America.

Batrachedra rileyi, id. *l. c.* p. 198, N. America.

Idiostoma americella, id. *l. c.* p. 199, Texas.

Chauliodus petrusellus and *nigro-striatellus*, Heylaerts, C.R. ent. Belg. xxvii. pp. xi. & xii., Hungary.

Laverna subiridescens, Walsingham, *l. c.* p. 194, Labrador.

Elachista (?) *metallifera*, id. *l. c.* p. 200, N. America.

Lyonetia latristrigella, id. *l. c.* p. 203, N. America.

Pterophoridæ.

South, R. Contributions to the History of the British *Pterophori* (continued). Ent. xvi. pp. 25–29, 73–77, 91, & 92, pls. i. & ii.

The species noticed are *Aciptilia baliodactylus*, Zell. (= *tridactylus*, Steph.), *pentadactylus*, Linn. (= *tridactyla*, Scop.), *spilodactylus*, Curt. (= *obsoletus*, Zell.); *Agdistis benneti*, Curt.; *Oxyptilus teucrii*, Greening; and *Mimeseoptilus phæodactylus*, Hübn. (= *lunidactylus*, Haw.).

Pterophorus pentadactylus, Linn. Larva described; Porritt, Ent. M. M. xix. p. 187.

Aciptilia siceliota, Zell. (?). Transformations described and figured; Millière, Ann. Soc. L. Lyon, xxix. p. 173, pl. iv. figs. 3–5.

Oxyptilus lantoscanus, sp. n., *id. l. c.* p. 176, pl. iv. fig. 8, Alpes-Maritimes.

Aciptilia apollina, sp. n., *id. l. c.* p. 177, pl. iv. fig. 9, Alpes-Maritimes.

Alucitidæ.

Alucita hexadactyla, Linn. Transformations described and figured; South, Ent. xvi. pp. 74 & 75, pl. ii. figs. 2 & 2*a–d*.

Alucita huebneri, Wallengr., ab. *cartereaui* from Bar-sur-Seine described; Jourdheuille, Cat. Lep. Aube, p. 220.

DIPTERA.

BY

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

THE GENERAL SUBJECT.

BAYNES-REED, E. *Diptera*—Two-winged Flies. Rep. E. Soc. Ont. 1882, pp. 45–53, figs. 11–54.

A short sketch, fully illustrated, of the principal families.

BIGOT, J. M. F. Diptères nouveaux ou peu connus. 20e & 21e parties. Ann. Soc. Ent. Fr. (6) iii. pp. 61–88 & 221–258.

Includes *Volucella*, Geoffr., *Phalacromyia*, Rond., and the commencement of an extensive essay on *Syrphidæ*, including introductory remarks, descriptions of new genera, and tables of families and genera. The following genera are rejected:—*Cryptoneura*, Big., *Temnocera*, Lep., and *Spilomyia*, Meig. *Brachymyia*, Willist., = *Eurhynomallota*, Big. Many genera are omitted as imperfectly characterized, and many conjectural emendations are hazarded. The corrected diagnoses of several new genera proposed in Bull. Soc. Ent. Fr. (6) iii. are given, in addition to a few new ones.

BRAUER, F. Beiträge zur Kenntniss des Flügelgeäders der Dipteren nach Adolph's Theorie. Wien. ent. Z. ii. pp. 27–30, woodcuts.

The neuration of *Epidosis* and *Platyura* is described, and contrasted with that of *Sargus* and *Ptecticus*.

HANSEN, H. J. Fabrica Oris Dipterorum: Dipterernes Mund i anatomisk og systematisk Henseende. i. (*Tabanidæ*, *Bombyliidæ*, *Asilidæ*, *Thereva*, *Mydas*, *Apiocera*.) Nat. Tids. (3) xiv. pp. 1–220, pls. i.–v.

Includes a bibliographical sketch, general remarks, and detailed anatomical descriptions. A full abstract of the latter part of the paper is appended, in Latin.

JACOBS, —. On the Presence of Œstridean and Muscidean Larvæ in the Human Body. Translated, with foot-note references and remarks, by T. S. Cobbold. Veterinarian, 1883, pp. 8.

KIENITZ, M. Die Entstehung der "Markflecke." Bot. Centr. xiv. pp. 21–26 & 56–61, pls. i. & ii. (*Cf.* Wien. ent. Z. ii. pp. 234 & 235.)

Relates to undetermined larvæ of *Diptera*, which burrow beneath the bark of various young trees, forming galleries which are closed by fresh cells as the tree grows.

KOWARZ, F. Beiträge zu einem Verzeichnisse der Dipteren Böhmens. Wien. ent. Z. ii. pp. 108–110, 168–170, & 241–243.

List of species as far as the *Therevidæ*, with occasional short notes or descriptions of new species.

LEE, A. B. Bemerkungen über den feineren Bau der Chordotonal-Organe. Arch. mikr. Anat. xxiii. pp. 133–140, pl. vii.B.

The author has found these organs in the following larvæ:—*Culex* (various species), *Chironomus plumosus*, *Simulium*, *Psychoda*, a Tipulid, *Tabanus autumnalis*, *Eristalis* (several species), 2 *Syrphidæ*, and 2 *Muscidæ*. He records his observations, according to which these organs appear to be generally very similar in structure in the various species which possess them.

LÖW, F. Ueber Myiasis und ihre Erzeuger. Wien. Mediz. Wochenschr. xxxiii. pp. 972–975. (*Cf.* Wien. ent. Z. ii. pp. 285 & 286.)

The chief species discussed are *Sarcophaga magnifica*, Schin. (= *wohlfahrti*, Portsch.), *Compsomyia macellaria*, Fabr. (= *Calliphora anthropophaga*, Conil, *infesta*, Phil., and *Lucilia hominivorax*, Coq.). *Hypoderma diana*, Brauer (?), and *Dermatobia* sp. Cases of myiasis in the human subject due to *Œstridæ* are rare and accidental.

OSTEN-SACKEN, C. R. Enumeration of the *Diptera* of the Malay Archipelago, collected by O. Beccari, &c. Supplement. Ann. Mus. Genov. xviii. pp. 10–20.

Includes a new genus and species, notes on the *Diptera* with an *Achias*-like development of the head (*Laglaisia*, *Anæropsis*, *Zygothrica*), additions and corrections, and a list of new genera and species described in this and the former paper.

ROMBOUTS, J. E. De la faculté qu'ont les mouches de se mouvoir sur le verre et sur les autres corps polis. Arch. Mus. Teyl. (2) i. pp. 185–200, woodcuts.

The writer attributes the power which flies possess of standing and walking on smooth surfaces to capillary attraction, due to the fine hairs of their pulvilli, which are moistened by a liquid secretion.

VERRALL, G. H. *Diptera* in Arran. Ent. M. M. xix. pp. 222–226.

200 species captured during a fortnight in June.

WULP, F. M. VAN DER. Amerikaansche *Diptera* (Vervolg van deel xxv.). Tijdschr. Ent. xxvi. pp. 1–60, pls. i. & ii.

Extends from *Syrphidæ* to *Hippoboscidæ*. [The former parts are noticed in Zool. Rec. xviii. *Ins.* p. 235, & xix. *Ins.* p. 237.] Details of the following known species are figured:—*Allograpta obliqua*, Say, *exotica*, Wied., *Mesograpta duplicata* and *basilaris*, Wied., *pulchella*, Macq., *arci-*

fera, Löw, *Conops costatus*, Fabr., *Belvoisia bifasciata*, Fabr., *rufipalpis*, Macq., *Pterotænia fasciata*, Wied., *Urophora diaphana*, Van der Wulp, *Tephritis bullans*, Wied., *Heterochroa picta*, Schin. (figured), and *pictipennis*, Van der Wulp.

In breeding *Diptera* from galls, species that are not true gall-producers have been sometimes bred, and mistaken for the real occupants. Among these were *Sciara tiliicola*, Löw, *foliorum*, Rad., *Cecidomyia ocellaris*, Ost.-Sack., *C. strobilina*, Rad., *Diplosis gollmeri*, Karsch, and *Cecidomyia foliorum*, Löw, = *bedeguariformans*, Rad. Löw, Wien. ent. Z. ii. pp. 217–220.

Dipterous larvæ beneath the human skin; W. G. Smith, Ann. N. H. (5) xi. p. 213.

Flies are probably a grave source of both infectious and parasitic diseases: Grassi, Arch. Ital. Biol. iv. pp. 205–208; Gazetta degli Ospedali (Milan, July 25, 1883, No. 59); Bull. Ent. Ital. xv. pp. 348 & 349.

Dipterous parasites on *Phylloxera* in America; Riley, Canad. Ent. xv. p. 39.

Shallots destroyed by larvæ of *Cyrtoneura stabulans*, Linn., and *Phorbia cepetorum*, Meade; Fletcher, Ent. M. M. xx. pp. 163 & 164.

Epidosis defecta, Löw, *Diplosis polypori*, Winn., *Phora rufipes*, Fabr., *Anthomyia* sp., *Sciophila punctata*, Meig., and *fasciata*, Zett., and *Lasiosoma pilosum*, Meig., bred from a fungus (*Polyporus versicolor*, Linn.) found on the trunk of a beech-tree in autumn; Girschner, Ent. Nachr. ix. p. 204.

Gonia trifaria, Zell., ♂, and *Gonia capitata*, De Geer, ♀ (*Tachinidæ*), and *Trineura stictica*, Meig., ♂ and *aterrima*, Fabr., ♀ (*Phoridæ*), found in coitû; *id.* Ent. Nachr. ix. p. 204.

J. Schnabl has published an important paper (in Polish) on the collection and preparation of *Diptera*; Odbitka z. Pamietn. Fizyjogr. i. [1881] (*cf.* Wien. ent. Z. ii. p. 46).

Reply to some remarks of Bigot; Mik, Wien. ent. Z. ii. pp. 64–66.

Directions for mounting the proboscis of a fly; Lofthouse, Microscop. News, iii. pp. 21 & 22, fig., and J. R. Micr. Soc, (2) iii. pp. 292 & 293.

Popular article on house-flies; Harrington, Rep. E. Soc. Ont. 1882, pp. 38–44, fig. 55 (head).

Notes on a small collection of *Diptera* from the Arctic Regions; Van der Wulp, Ent. Tijdschr. xxvi. pp. xxiv.–xxvi.

List of *Diptera* taken in the North of Scotland, chiefly in the province "Dee"; Vice, Scot. Nat. (2) i. pp. 9–19.

Undetermined fly troublesome on hills in Yorkshire in the time of Ray; Bloomfield, Naturalist, viii. pp. 93 & 94.

10 species of *Diptera* noticed as new to Holland; Van der Wulp, Ent. Tijdschr. xxvi. pp. cxxxvi. & cxxxvii.

List of 137 *Diptera* occurring at Zwickau; Schlechtendal, JB. Ver. Zwickau, 1879, pp. 48–58.

Fourth Supplement to list of *Diptera* of Kharkow; Jaroschewsky, Trud. Nat. Ges. Kharkow, 1882.

List of *Diptera* received from the Canary Islands; Von Röder, Wien. ent. Z. ii. pp. 93–95.

"Elephant-fly" troublesome in Central Africa, and leaving a strong scent of honey on the fingers when crushed; Emin-Bey, Geogr. MT. xxix. p. 326.

Cecidomyiidæ.

Wachtl, F. A. Einige neue europäische Gallmücken (Cecidomyiden). Centr. ges. Forstw. 1883, pp. 476–478. (*Cf.* Wien. ent. Z. ii. p. 285).

Cecidomyia. Discovery of supposed spinnerets in the larvæ; Mik, Wien. ent. Z. ii. pp. 40 & 41. Fungus on juniper, simulating galls produced by these flies; Fitch & White, P. E. Soc. 1883, pp. vi., xxii., & xxiii. Injurious to asters; Letzner, JB. schles. Ges. lx. pp. 309 & 310. Parasitic on *Phylloxera*; Fyles & Hagen, Canad. Ent. xv. pp. 83 & 84. *C. leguminicola* and *destructor*, Say, noticed; Saunders, Rep. E. Soc. Ont. 1882, pp. 68 & 69. *C. saliciperda*, Duf.: transformations; Schlechtendal, JB. Ver. Zwickau, 1879, pp. 26 & 27. *C. salicis-batatus* destroyed by *Platygaster* sp.; Kellicott, Bull. Buff. Nat. Field Club, March, 1883 (*cf.* Psyche, iv. p. 79). *C. violæ*, Löw, Tr. Essex Club, iii. p. lxiv.

Diplosis tritici, Kirby (Hessian Fly) discussed in detail; Packard, Rep. U. S. Ent. Comm. iii. chap. viii. pp. 198–248, map iii. pls. iv. & v., and App. pp. 3–49 (reprints of articles by various authors), and Rep. Ins. Illin. x. pp. 193–232 (*cf.* also Lintner, Rep. Ins. N. York, i. pp. 6 & 7).

Lasioptera populnea, sp. n., Wachtl, Centr. ges. Forstw. 1883, p. 477, Austria.

Cecidomyia baccarum, p. 477, *moraviæ* and *bupleuri*, p. 478, *id. l. c.*, Austria; *C. hygrophila*, Mik, Wien. ent. Z. ii. pp. 209–216, pl. iii., Austria: spp. nn.

Mycetophilidæ.

Beling, T. Der Heerwurm, die Heerwurmsmücke, und die Thomas-Trauermücke. Z. Naturw. lvi. pp. 253–271.

The literary and life-history of *Sciara militaris*, Meig., is discussed. It is the larva of this species, and not of *S. thomæ*, Linn., which is known as the "Heerwurm."

Sciophila punctata, Meig., *fasciata*, Zett., and *Lasiosoma pilosum*, Meig. Larvæ described; Girschner, Ent. Nachr. ix. p. 204.

Sciara morio, Fabr. (?): transformations noticed and figured; Bellevoye, Bull. Soc. Metz (2) xiv. p. 196 [1876]. *S. ocellaris*, Comst., discussed; Mik, Verh. z.-b. Wien, xxxiii. pp. 190–192.

Paratinia sciarina, Mik. Variation noticed by him; Wien. ent. Z. ii. pp. 39 & 40.

Sciara vitticollis, p. 182, *riparia*, *pumilio*, and *morionella*, p. 183, spp. nn., Holmgren, Ent. Tidskr. iv. Matotshkin, &c.

Sciophila fuliginosa, sp. n., *id. l. c.* p. 189, Matotshkin.

Boletina erythropyga and *fuscula*, spp. nn., *id. l. c.* pp. 189 & 190, Matotshkin.

Simuliidæ.

Simulium attacking pupæ of *Pieris menapia*, Feld.; Hagen, P. Bost. Soc. xxii. p. 139, and Ent. M. M. xix. pp. 254 & 255.

Bibionidæ.

Bibio anglicus, Löw, recorded from the Pyrenees; Bigot, Bull. Soc. Ent. Fr. (6) iii. p. xxvi.

Dilophus vulgaris, Macq., noticed; Girard, *tom. cit.* p. xlvi.

Blepharoceridæ.

Paltostoma torrentium, F. Müller. Anatomy and physiology of all stages described by him; Arch. Mus. R. Jan. iv. [1879, pub. 1881], pp. 49–85, pls. iv.–vii.

Culicidæ.

Muir, W. The Head and Sucking Apparatus of the Mosquito. Can. Nat. (2) x. pp. 465 & 466.

Murphy, E. The Proboscis and Blood-sucking Apparatus of the Mosquito, genus *Culex*. Can. Nat. (2) x. pp. 463 & 464.

White, T. C. On the Histological Development of the larva of *Corethra plumicornis*. J. Quek. Club (2) i. pp. 66–76, pl. ii.

Relates to the head, thorax, nervous and alimentary systems, dorsal vessel, &c. (Discussion, with notice of air-sacs, by Hardy, *tom. cit.* p. 103.)

Wielowiejski, H. v. Über die Fettkörper von *Corethra plumicornis* und seine Entwicklung. Zool. Anz. vi. pp. 318–322.

Culex. Popular article on mosquitoes; McLachlan, Encyl. Brit. ed. ix. xvi. pp. 866 & 867, figs. 1–3.

Culex autumnalis, sp. n., Weyenbergh, Hab. Rio Primero, plate, Montevideo [cf. *Insecta*, General Subject, *suprà*, p. 11].

Chironomidæ.

Balbiani, M. On the Significance of the Polar Cells of Insects. Ann. N. H. (5) xi. pp. 64–66.

A translation of a paper recorded in Zool. Rec. xix. *Ins.* p. 239.

Jaworowski, A. Weitere Resultate entwicklungsgeschichtlicher und anatomischer Untersuchungen über die Eierstöcke bei *Chironomus* sp., und einigen anderen Insecten. Zool. Anz. iii. pp. 211–215.

Treats briefly of the anatomy and differentiation of the egg, and of the development of the embryo. The author's observations lead him to the conclusion that the ovarian passages (ovarialschlaüche) of Vertebrates and Insects originate in a similar manner, but not, as supposed by Wal-

Muscidæ.

Kraepelin, K. Zur Anatomie und Physiologie des Rüssels von *Musca*. Z. wiss. Zool. xxxix. pp. 683–719, pls. xl. & xli.

The writer's object has been to give a more minute account of this organ than has hitherto been attempted, from the observation of a large number of species. The paper is divided into three principal sections: (1) Chitinous parts; (2) muscles, and organs of motion; (3) hairs and organs of sense.

Prima, F. Considérations sur la *Lucilia hominivorax*, observations recueillies à la Guyane française. Paris: 1882, pp. 47.

[Not seen by Recorder.]

Snow, F. H. Hominivorous Habits of *Lucilia macellaria*, Fabr., the "Screw Worm." Psyche, iv. pp. 27–30.

The details of several cases are given. Although the insect is common throughout North and South America, it is not recorded to attack man north of Kansas. [*Cf.* also Am. Nat. xvii. p. 423, and Le Nat. vi. pp. 300–302; Humbert & Riley, P. U. S. Nat. Mus. vi. pp. 104 & 105, and Ann. N. H. (5) xii. pp. 353–355.]

Calliphora quadrimaculata, Swed. (= *dasyophthalma*, Macq.). Habits in the Auckland Islands noticed; Raynal & Handlirsch, Verh. z.-b. Wien, xxxiii. pp. 245 & 256.

Laglaisia caloptera, Big., compared with *Achias ichneumonea*, Westw.; Osten-Sacken, Ann. Mus. Genov. xviii. pp. 15 & 16.

Zygothrica robusta, Big., is an *Achias* near *A. dacoides*, Walk., but the true *Zygothrica* is allied to *Drosophila*; id. *l. c.* p. 17.

Pollenia rudis, Fabr. ("Cluster Flies"). Habits noticed; Dall, P. U. S. Nat. Mus. v. pp. 635–637, Pickmann Mann, Psyche, iii. pp. 378 & 379, and Riley, Am. Nat. xvii. pp. 82 & 83.

Formosia smaragdifera, Big., = *Rutilia pretiosa*, Voll.; Osten-Sacken, *l. c.* p. 19.

Dasyphora spinifera, sp. n., Van der Wulp, Tijdschr. Ent. xxvi. p. 39, Argentine Republic.

Cyrtoneura nudiseta, sp. n., *id. l. c.* p. 42, Argentine Republic.

Anthomyiidæ.

Lintner, J. A. On some species of *Anthomyiidæ*. Rep. Ins. N. York, i. pp. 168–211, figs. 45–62.

After a brief sketch of the family, the following North American species are noticed in more or less detail: *Phorbia ceparum*, Meig., *cilicrura*, Rond., *Anthomyia brassicæ*, Bouché, *radicum*, Linn., *raphani*, Harr., *zeæ*, Riley, *Hylemyia deceptiva*, Fitch, *similis*, Fitch, and *Phorbia floccosa*, Macq.

Meade, R. H. Annotated List of British *Anthomyiidæ*. Ent. M. M. xix. pp. 213–221, and xx. pp. 9–14, 59–61, & 104–109.

Extends from *Phorbia*, Desv., to *Schænomyia*, Hal. The British species

are discussed, and some described as new. The paper concludes with a table of genera.

Note on leaf-mining *Anthomyiidæ*; Lintner, Rep. E. Soc. Ont. 1882, p. 31.

Aricia umbratica, Meig., and *Spilogaster vespertina*, Fall., are probably the same species, though one has hairy and the other naked eyes; Everts, Tijdschr. Ent. xxvi. pp. xx. & xxi.

Mydæa (*Spilogaster*) *angelicæ*, Scop., and *urbana*, Meig., discussed; Van der Wulp, Tijdschr. Ent. xxvi. pp. 116–118.

Anthomyia ceparum (Onion Fly). Transformations and ravages: Harris, Sci. Goss. xix. pp. 175–178 & 262, woodcuts.

Trichophthicus innocua and *hirsutula*, Zett., noticed; Verrall, Ent. M. M. xix. pp. 226.

Proboscimyia, g. n., Bigot, Bull. Soc. Ent. Fr. (6) iii. p. xxx. Allied to *Anthomyia*; antennæ very short; haustellum slender, rigid, straight, produced beneath nearly as far as the tip of the abdomen. Type, *P. siphonina*, sp. n., *ibid.*, Rocky Mountains.

New species:—

Aricia nordenskiöldi, *proboscidea*, p. 166, *macroglossa*, p. 167, *sordidipennis*, *segnis*, p. 169, *ædemа*, p. 170, *remorata* and *coronata*, p. 171, Holmgren, Ent. Tidskr. iv., Novaya Zemlya.

Spilogaster sexpunctata, Van der Wulp, Tijdschr. Ent. xxvi. p. 43, Argentine Republic.

Limnophora lynchi, id. *ibid.*, Argentine Republic.

Anthomyza balteata, Holmgren, *l. c.* p. 172, Besimannaja Bay.

Chortophila albo-striata, Van der Wulp, *l. c.* p. 46, Argentine Republic; *C. betarum*, Lintner, Rep. Ins. N. York, i. p. 208, fig. 61 (wing), United States.

Pegomyia vicina, id. *l. c.* p. 209, fig. 69 (wing), United States.

Phorbia cepetorum, England, N. America, p. 218, *neglecta*, England, p. 219, and *exigua*, Lancashire, p. 220, Meade, Ent. M. M. xix.

Cordyluridæ.

Scatomyza cordylurina, p. 173, *multisetosa*, p. 174, *varipes*, p. 175, and *erythrostoma*, p. 176, spp. nn., Holmgren, Ent. Tijdschr. iv., Waigats and Novaya Zemlya.

Cordylura frigida, sp. n., *id. l. c.* p. 176, Matotshkin Strait.

Sciomyzidæ.

Dryomyza flaveola, Fabr. The summer and autumn broods differ considerably; the latter may be *D. zawadskii*, Schumm.: Girschner, Ent. Nachr. ix. pp. 201–203.

Ectinocera (?) *occidentalis*, sp. n., Van der Wulp, Tijdschr. Ent. xxvi. p. 48, pl. ii. fig. 9, Argentine Republic.

Micropezidæ.

Anæropsis lorquini, Big., = (*Phytalmia*) *guttipennis*, Walk., and is a Micropezid allied to *Calobata* and *Nestima*; Osten-Sacken, Ann. Mus. Genov. xviii. pp. 16 & 17.

Paranerius, g. n., Bigot, Bull. Soc. Ent. Fr. (6) iii. p. lxvi. Allied to *Nerius* and *Telostylus*. Type, *P. miki*, sp. n., *ibid.*, Batchian (*Nerius inermis*, Schin., may also belong here).

Calobata albiceps, Van der Wulp, Tijdschr. Ent. xxvi. p. 50, Quebec.

Micropeza nigrina, sp. n., *id. ibid.*, Argentine Republic.

Ortalididæ.

Ortalis cerasi, Linn. Transformations described; the earliest-ripening cherries are generally selected by birds because infested by this insect: JB. Annab. Ver. iv. pp. 14 & 15, pl. ii.

Trypeta alternata, Fall., mining the leaves of *Impatiens noli-me-tangere*; Fletcher, Ent. M. M. xx. p. 163. *T. cerasi*, Linn., noticed; Hagen, Canad. Ent. xv. pp. 159 & 160. *T. pulla*, Wied., = *Amphicnephes pertusus*, Löw; Osten-Sacken, B. E. Z. xxvii. p. 298.

Themara ampla, Dol. (*nec* Walk.), = *Trypeta quadrifera*; Osten-Sacken, Ann. Mus. Genov. xviii. p. 19.

Trypeta (*Icaria*) *scudderi*, sp. n., Weyenbergh, Verh. z.-b. Wien, xxxii. pp. 363–368, figs. 1–3, Cordova (*cf.* also Osten-Sacken, pp. 369 & 370).

Lonchæidæ.

Lonchæa lasiophthalma, Macq., injurious to *Cynodon dactylon*; Redi's observations reprinted by Osten-Sacken: Bull. Ent. Ital. xv. pp. 187 & 188.

Sapromyzidæ.

Sapromyza difformis, Löw, discussed, and differentiated from its allies; Girschner, Ent. Nachr. ix. p. 203.

Piophilidæ.

Piophila arctica and *fulviceps*, spp. nn., Holmgren, Ent. Tidskr. iv. p. 177, Waigats, &c.

Diopsidæ.

Diopsis argentifera, Big., = *subnotata*, Westw.; Osten-Sacken, Ann. Mus. Genov. xviii. p. 20.

Ephydridæ.

Ephydra hians, Say, and other species. Larvæ used as food by Indians; Am. Nat. xvii. pp. 976 & 977.

Notiphila sinensis, Schin., belongs to *Paralimna*; Osten-Sacken, Ann. Mus. Genov. xviii. p. 20.

Ephydra cæsia, sp. n., Van der Wulp, Tijdschr. Ent. xxvi. p. 58, Argentine Republic.

Drosophilidæ.

Drosophila ampelophila, Löw, and allies, noticed: Lintner, Rep. Ins. N. York, i. pp. 216–221, fig. 65 (wing), and Bowles, Rep. E. Soc. Ont. 1882, pp. 21–23, figs. 12 & 13. It is a cosmopolitan species, and *D. uvarum*, Rond., is a synonym; Mik, Verh. z.-b. Wien, xxxiii. p. 188.

Oscinidæ.

Meromyza americana, Fitch, discussed; Lintner, Rep. Ins. N. York, i. pp. 221–227, figs. 66 & 67.

Phytomyzidæ.

Phytomyza glechomæ, Kalt., noticed: Inchbald, Ent. xvi. pp. 285 & 286. *P. nigricornis*, Macq., noticed and figured; Westwood, Gard. Chron. (2) xix. p. 593, figs. (*cf.* also p. 637).

Phoridæ.

Phora rufipes, Meig. Larvæ voided by a patient; Schnabl, Wiadomosci z nauk przyrodzonych. ii. (*cf.* Wien. ent. Z. ii. p. 46).

Hippoboscidæ.

Stenopteryx hirundinis, Linn., noticed; Reuter, Medd. Soc. Fenn. ix. p. 126.

NEUROPTERA.

BY

ROBERT MCLACHLAN, F.R.S., F.L.S., &c.

THE GENERAL SUBJECT.

MCLACHLAN, ROBERT. *Neuroptera* of the Hawaiian Islands. Ann. N. H. (5) xii. Part i. *Pseudo-Neuroptera*, pp. 226–240. Part ii. *Planipennia*, and General Summary, pp. 298–303.

Drawn up chiefly from materials collected by T. Blackburn. 23 species are noticed or described, 12 of which are *Odonata*. Three distinct faunistic elements probably exist, viz: (1) the North American, represented by naturally or artificially introduced species; (2) the endemic, much the largest; (3) the Australian, which is very slight so far as these insects are concerned.

PACKARD, A. S., JUN. See *Orthoptera*.

SCUDDER, SAMUEL H. The Carboniferous Hexapod Insects of Great Britain. Mem. Bost. Soc. iii. pp. 213–224, pl. xvii.

An amplification of already-published notes [*cf.* Zool. Rec. xviii. *Ins.* pp. 12, 256, & 258], referring almost entirely to *Neuroptera*. Full descriptions and figures of *Brodia prisco-tincta*, pp. 213–217, pl. xvii. figs. 3–7, *Archæoptilus ingens*, pp. 217 & 218, figs. 10–12, and *Lithosialis brongniarti*, pp. 221–223, figs. 1, 2, 8, & 9, are given. (The paper concludes with a list of Carboniferous British species, viz.: 4 *Neuroptera*, 2 *Orthoptera*, and 1 *Coleoptera*, p. 223.)

——. Notes on some of the Tertiary *Neuroptera* of Florissant, Colorado, and Green River, Wyoming Territory. P. Bost. Soc. xxi. pp. 407–409.

A list of species in all families taken in Calabria in 1876 is given by A. Costa, Atti Acc. Nap. ix. pp. 52 & 53.

A list of 50 species, of all divisions and families, found at Rouge-Cloître, in Belgium, is given by A. De Bormans in C.R. ent. Belg. xxvii. pp. xxiii.–xxviii.

In the "Nat. Hist. of Hastings and Vicinity," 1st Supplement (1883), is given a list of species of all families occurring in the district.

Dictyoneura sinuosa, p. 259, pl. xxxv. fig. 4, *nigra*, p. 260, pl. xxxv. fig. 5, spp. nn., Kliver, Palæontogr. xxix., fossil in the Carboniferous of Saarbrück.

Trichoptera.

Morton, Kenneth J. Notes on the *Trichoptera* of Upper Clydesdale. Ent. M. M. xix. pp. 194–196.

Enumerates 69 species, with notes on habits, &c.

Swinton, A. H. Caddis-fly Hunting in 1882. Naturalist, viii. pp. 161 & 162.

Popular notes.

Notes on some species in Co. Monaghan, Ireland; K. J. Morton, Ent. M. M. xx. p. 142.

A marine Caddis-worm. McLachlan's paper [*cf.* Zool. Rec. xix. *Ins.* p. 255] reprinted in N. Z. J. Sci. i. pp. 307–311. W. A. Haswell, *l. c.* p. 318, mentions having found a similar larva between tide marks in Port Jackson. Hagen, Ent. M. M. xix. p. 235, calls attention to a notice by him of a caddis larva, allied to *Molanna*, living in the sea off the coast of Massachusetts.

Phryganeidæ.

Phryganea striata, L. K. J. Morton notices the manner in which the metamorphosis from pupa to imago takes place; Ent. M. M. xx. p. 168.

Phryganea micacea, sp. n., Fritsch, Beitr. Pal. Oesterr.-Ung. ii. Heft ii. p. 7, pl. ii. fig. 8; a fossil caddis-case from the Cretaceous of Aachen. [Probably to be referred to *Limnophilidæ*.—Rec.]

Limnophilidæ.

Limnophilus diphyes, McLach., and *Stenophylax dubius*, Steph., discovered in Finland; J. Sahlberg, Medd. Soc. Fenn. ix. p. 140.

Mesophylax aspersus var. (since recognized as distinct) found in Dumfriesshire; J. J. King, Ent. M. M. xx. p. 19, and Ent. xvi. p. 13.

Halesus guttatipennis, McLach. A second example recorded as British; McLachlan, Ent. M. M. xx. p. 116.

Hydropsychidæ.

Clarke, Cora H. Description of Two Interesting Houses made by Native Caddis-fly Larvæ. P. Bost. Soc. xxii. pp. 67–71, woodcuts.

Concerns the cases of two larvæ from the neighbourhood of Boston, U.S.A. The first is a *Hydropsyche*, which (as a larva) forms an open network, covered with sand, vegetable matters, &c. (figs. 1 & 2). The second is a species of *Plectrocnemia*, which constructs mud-tubes standing erect above the bottom surface, and with curious lateral channels or chambers; the larvæ are described (figs. 3–6).

Neuroptera-Planipennia.

In discussing the Tertiary *Neuroptera* of Colorado and Wyoming, in P. Bost. Soc. xxi., pp. 407–409, S. H. Scudder says the discoveries include 7 genera and 12 species of *Planipennia*. The *Raphidiidæ* are the most numerous; there are a single *Osmylus*, 4 *Chrysopidæ*, and 1 *Panorpidæ*.

Panorpidæ.

Panorpa germanica, L., var. *borealis*, Steph., occurs abundantly at Tongue, Sutherlandshire, in July, apparently to the exclusion of the type-form; J. J. King, Ent. M. M. xx. p. 141.

Panorpa hybrida, McLach. Description translated and reproduced in Ent. Nachr. ix. p. 27.

Boreus westwoodi, Hag., in Finland; J. Sahlberg, Medd. Soc. Fenn. ix. p. 154.

Dilaridæ.

Dilar japonicus, sp. n., McLachlan, Ent. M. M. xix. p. 220, Japan.

Hemerobiidæ.

Megalomus. An undescribed species recorded from the Hawaiian Islands; McLachlan, Ann. N. H. (5) xii. p. 270.

Abundance of *Hemerobius* [? *Chrysopa*: Rec.] near London; P. Watchurst, Ent. xvi. p. 284.

Chrysopidæ.

McLachlan, Robert. The Distinctive and Sexual Characters of *Chrysopa flava*, Scopoli, and *C. vittata*, Wesmael. Ent. M. M. xx. pp. 161–163.

Anomalochrysa, g. n., McLachlan, Ann. N. H. (5) xii. p. 298. Allied to *Chrysopa*, but with three or more series of gradate nervules. *A. hepatica*, p. 299, and *rufescens*, p. 300, Hawaiian Islands, spp. nn.

Palæochrysa and *Tribochrysa*, gg. nn., Scudder, allied to *Nothochrysa*, fossil in the Tertiaries at Florissant, briefly noticed in P. Bost. Soc. xxi. p. 408.

Chrysopa microphya, sp. n., McLachlan, *l. c.* p. 300, Hawaiian Islands.

Nemopteridæ.

Nemoptera sinuata, Oliv., found thirty leagues north of Antioch in June; H. Lucas, Bull. Soc. Ent. Fr. (6) iii. p. cxvi.

Nematoptera pusilla, sp. n., Taschenberg, Z. Naturw. lvi. p. 183, Socotra.

Ascalaphidæ.

Ascalaphus ustulatus, Ev. McLachlan calls attention to this Caucasian species, which does not appear to have been noticed since the original description was published in 1850, and indicates its affinity with the Japanese *A. ramburi*, McLach., and especially with the Spanish *A. hispanicus*, Rbr.; C.R. ent. Belg. xxvii. p. cxlii.

Myrmeleonidæ.

McCook, H. C. On the Habits of the Ant-Lion. P. Ac. Philad. 1882 [1883] pp. 258–260.

Concerns *Myrmeleon* (*Dendroleon*) *obsoletus*, Say?. The habits of the larvæ fully described.

Nusbaum, J. Mundbewaffung und Mechanismus des Aussaugens bei der *Myrmeleo*-Larvæ. Phys. Denkschr. Warschau, i. pp. 349–356, pl. i.

[In Polish ; not seen by Recorder.]

Redtenbacher, Josef. Zur Kenntniss der Myrmeleoniden-Larven. Wien. ent. Z. ii. pp. 289–296.

Describes the larvæ and habits of *Myrmeleon erberi*, Brauer, *Mymecœlurus trigrammus*, Pallas, and (?) *Creagris plumbeus*, Oliv. (? *Megistopus flavicornis*), with comparative notes on *Myrmeleon europæus*, McLach., and *M. formicarius*, L., all from the neighbourhood of Pesth.

Myrmeleon erberi, Brauer, = *M. inconspicuus*, Rambur ; McLachlan, Ent. M. M. xx. p. 103.

Myrmecoleon socotranus, Taschenberg, Z. Naturw. lvi. p. 182, Socotra ; *M. falcipennis*, Costa. Atti Acc. Nap. (2) i. [1883] (*cf.* Bull. Ent. Ital. xv. p. 333, 1883 [1884]), Sardinia : spp. nn.

Pseudo-Neuroptera.

Thysanura.

Brook, George. Notes on some little-known *Collembola*, and on the British species of the genus *Tomocerus*. J. L. S. xvii. pp. 19–25, pl. i.

Records the occurrence in England and Jersey of species already described by Tullberg, with notes and figures. *Achoreutes mandibularis*, Tullb. (p. 19, pl. i. figs. 1–5), was found in Thanet ; *Xenylla maritima*, Tullb. (p. 20, figs. 6–10), in Jersey ; *Triæna mirabilis*, Tullb. (p. 21, figs. 11–14), at Huddersfield ; *Tomocerus vulgaris* (p. 22, figs. 15–19), in Jersey ; *Tomocerus longicornis*, Lubbock (*nec* Müll.), is regarded as *T. plumbeus*, L. ; *T. plumbeus*, Lubbock, is probably only a colour var. of *T. niger*, Bour. ; *T. tridentiferus*, Tullb., is the most common species in England.

——. A Revision of the Genus *Entomobrya*, Roud. (*Degeeria*, Nic.). *L. c.* pp. 270–283, pls. x. & xi.

After reviewing the history of the genus, and enumerating the described species, the author proposes to reduce the 24 to 11, many of them having been founded on colour-characters only. Full bibliography and synonymy are given. The figs. are as follows:—Figs. 1–11, external anatomy ; 12, *E. nivalis*, L. ; 13–15, *E. intermedia*, sp. n. (p. 274, Jersey) ; 16, var. *elongata* (p. 275, Austria) ; 17, *E. albocincta*, Temp. ; 18, *E. multifasciata*, Tullb. (var. *pulchella*, Ridley) ; 20, the same (type) ; 21, the same (pale form) ; 22, the same (approaching var. *nicoleti*,

Lubb.); 23, the same (var. *nicoleti*, nearly); 24, the same (var. *nicoleti*); 25 & 26, the same (var. *lanuginosa*, Nic.).

Lemoine, V. De l'acte génital probable observé chez le *Sminthurus fuscus*. C.R. Ass. Fr. xi. pp. 481 & 482.

The male seizes the antennæ of the female with his own; they remain in this position some time, the male being often lifted up by the female. At length, a drop of fluid is emitted from the genital tubercle of the male; this is seized by the female by aid of her mouth, and transferred to a special structure on the antennæ of the male, where it partially dries; the mass is then swallowed by the female, and, arriving near the anus, the fertilizing elements are conveyed to the ovaries by means of a special tube opening into the rectum.

——. Recherches sur le développement des Podurelles. *L. c.* pp. 483–520, 6 pls.

Lengthy and minute observations on *Anurophorus laricis* and *Sminthurus fuscus*, almost entirely embryological. The author is of opinion that both anatomy and embryology demonstrate that the *Thysanura* offer characters so distinct from those of other insects as to constitute a special group, close to true insects, but showing also incontestable affinities with *Crustacea*, *Arachnida*, and *Myriopoda*. The plates illustrate the gradual development of the embryo down to the exclusion of the larva.

Tömösváry, Odön. Species generis *Smynthurus* Faunæ Hungaricæ. Term. füzetek, vii. pp. 31–38.

A list, with descriptions, in Hungarian (diagnoses in Latin), of 6 species, with full synonymy, &c. 1 new species (*S. maculatus*, p. 36, with woodcut) is included.

A list of 6 species found in Southern Finland in January, 1882, is given by O. M. Reuter, Medd. Soc. Fenn. ix. p. 75.

Podura scales. For notes on these objects, especially with regard to the spines on them, *cf.* J. R. Micr. Soc. (ii.) iii. p. 501.

Mallophaga.

Piaget, E. Quelques Pédiculines nouvelles ou peu connues. Tijdschr. Ent. xxvi. pp. 152–158, pl. ix.

Taschenberg, O. Die Mallophagen, mit besonderer Berücksichtigung der von Dr. Meyer gesammelten Arten. Nova Acta Ac. L.-C. Nat. cur. xxiv. pp. 1–244, pls. i.–vii. Reviewed at great length by Piaget in Tijdschr. Ent. xxvi. pp. 144–151.

A very important memoir, limited to a consideration of the genera *Goniodes*, *Goniocles*, *Lipurus*, *Ornithobius*, *Acidoproctus*, and *Trichodectes* (in the old sense of the terms), and to a large extent supplementary to "Les Pédiculines" of Piaget [*cf.* Zool. Rec. xvii. *Ins.* p. 204], but with many new species, some new genera or subgeneric divisions, a multitude of redescriptions from types of Giebel and others, resulting in considerable synonymic changes; indications of new "hosts," &c., &c. It is not

within the purpose of the Zool. Rec. to analyse minutely all the points in a monograph such as this, nor could such an analysis serve any useful purpose. A special feature is that the species of various genera are, to a certain extent, grouped in accordance with the families of their bird-hosts, and showing that such a scheme of classification is, to a large extent, natural. Elaborate tabular diagnoses are given for *Goniodes* (pp. 20–22 ♂, pp. 23 & 24 ♀), *Gonioctes* (pp. 68–70), *Lipurus* (which is divided into a number of groups, pp. 107 & 108, each of which is tabulated separately), *Trichodectes* (pp. 203–205). More than 40 already known species are redescribed, and the greater part figured.

New genera, &c. :—

Coloceras (subg. of *Goniodes*), Taschenberg, *l. c.* p. 42. Founded principally on antennal characters. Includes *G. fasciatum*, Piag., *menadense*, Piag, *minus*, Piag., and *damicorne*, Nitzsch.

Rhopaloceras (subg. of *Goniodes*), id. *l. c.* p. 46. Includes *G. subdilatatum*, Piag., *dilatatum*, Gieb., *styliferum*, Nitzsch, *aculeatum*, Piag., *aliceps*, Nitzsch, and *laticeps*, Piag.

Strongylocotes, id. *l. c.* p. 54. Divided into *Strongylocotes*, p. 55 (which includes *S. setosus*, *spinosus*, and *complanatus*, Piag.), and *Lepidophorus*, ibid. (including *excavatus*, Piag., *agonus*, Nitzsch, and *coniceps*, sp. n., p. 63, pl. i. fig. 8, on *Tinamus variegatus*).

Eurymetopus, id. *l. c.* p. 182. For certain species of *Lipurus* with the facies of *Docophorus*. *L. latus*, Piag., *tauras*, Nitzsch, and *schillingi*, Rudow.

Bothriometopus, id. *l. c.* p. 188. For a species of *Lipurus* that forms a transition to *Acidoproctus*. *L. macrocnemis*, Nitzsch (with which *L. simillimus*, Gieb., is united).

New species, &c. :—

Goniodes parvulus, Taschenberg, *l. c.* p. 38, pl. i. fig. 4, on *Tinamus robustus*.

Gonioctes hologaster (Nitzsch) var. *maculatus*, id. *l. c.* p. 76, pl. iii. fig. 3., *discogaster*, p. 86, pl. ii. fig. 12, on *Megapodium freycineti* ; *G. macrocephalus*, p. 87, pl. ii. fig. 11, on *Talegallus lathami* ; *G. guttatus*, p. 89, pl. ii. fig 14, on *Penelope crista* and *pipila* ; *G. verrucosus*, p. 94, pl. iii. fig. 4, on *Tinamus variegatus* ; *G. procerus*, p. 96, pl. ii. fig. 6, on *Henicophaps albifrons* ; *G. affinis*, p. 97, pl. ii. fig. 4, on *Carpophaga rufigastra*. *G. latifasciatus*, Piaget, *l. c.* p. 157, pl. ix. fig. 4, on *Cinclosoma bicolor*.

Lipurus baculus (Nitzsch) var. *cavifrons*, Taschenberg, *l. c.* p. 124, pl. iii. fig. 9*a*, on *Carpophaga ænea* and *badia* ; *L. fortis*, p. 126, pl. iii. fig. 11, on *Otidophaps nobilis* ; *L. testaceus*, p. 135, pl. v. fig. 3, on *Procellaria capensis* ; *L. gurlti*, p. 151, pl. v. fig. 6, on *Procellaria capensis* and *glacialoides* ; *L. lugubris* (*sulæ*, Rud. ?), p. 153, pl. vi. fig. 9, on *Sula fiber* ; *L. fuliginosus*, p. 156, pl. iv. fig. 3, on *Diomedea exulans* and *chlororhyncha* ; *L. burmeisteri*, p. 170, pl. vi. fig. 4, on *Lophophorus impeyanus* ; *L. ischnocephalus*, p. 173, pl. vi. fig. 8, on *Talegallus lathami* ; *L. meyeri*, p. 175, pl. vi. fig. 1, on *Talegallus fuscirostris* ; *L. oxycephalus*, p. 178, pl. vi. fig. 7,

on *Megapodius freycineti* and *reinwardti* ; *L. sinuatus*, p. 180, pl. vi. fig. 6, on *M. freycineti* and *reinwardti*.

Trichodectes peregrinus, id. *l. c.* p. 218, pl. vii. fig. 10, on *Myeteria crumenifera* ; *T. meyeri*, p. 222, pl. vii. fig. 13, on *Antilope* ?.

Ancistrona gigas, Piaget, *l. c.* p. 152, pl. ix. fig. 1, on a *Procellaria*.

Nirmus semiannulatus, id. *l. c.* p. 156, pl. ix. fig. 3, on *Barita leuconota*.

Thysanoptera.

Osborn, Herbert. Note on *Thripidæ*, with descriptions of new species. Canad. Ent. xv. pp. 151–156.

In the introductory portion, the author states that if these insects are ever carnivorous, it can only be exceptionally. *Thrips tritici*, Fitch, redescribed at p. 156.

Portschinsky, J. Histoire naturelle d'un *Thrips* observé sur les feuilles de tabac en Bessarabie en 1882. Rev. mens. Ent. i. pp. 44–53.

Concerns a species considered to be *T. urticæ*, L., which appeared in enormous numbers on the tobacco in 1882. Full details of habits and transformations are given, and especially of the little-known nymph-stage. Three or four days after the deposition of the eggs, the larvæ emerge, and the whole development to the winged state occupies only six to eight days. The author is of opinion that they only attack unhealthy plants. They are greatly preyed upon by *Acari*.

New species :—

Phlæothrips nigra, Osborn, *l. c.* p. 154, Iowa.
Chirothrips antennatus, id. *ibid.*, Iowa.
Thrips striata, id. *l. c.* p. 155, Iowa.

Termitidæ.

Romanis, Robert. Observation on the *Termites* of Rangoon. Ent. xvi. pp. 214 & 215.

Stray notes on the habits of a species which was perhaps *Termes taprobanes*, Wlk. They were devoured both by toads and by bats.

Scudder, Samuel H. The Fossil White Ants of Colorado. P. Am. Ac. xix. pp. 133–145.

Commences with a sketch of the known existing and fossil species. 6 additional fossil species are described, 3 of which form a new genus.

Calotermes castaneus, Burm., and *C. marginipennis*, Latr., in the Hawaiian Islands; McLachlan, Ann. N. H. (5) xii. p. 227.

Parotermes, g. n., Scudder, *l. c.* p. 135. Allied to *Hodotermes*, but the submarginal vein present. For *P. insignis*, p. 137, *hageni*, p. 139, and *fodinæ*, p. 141, spp. nn., fossil in the Florissant Tertiaries.

Hodotermes (?) *coloradensis*, sp. n., *id. l. c.* p. 142, fossil at Florissant.

Eutermes forssarum, p. 143, and *meadii*, p. 144, spp. nn., Scudder, *l. c.* fossil at Florissant.

EMBIIDÆ.

WOOD-MASON, J. A Contribution to our Knowledge of the *Embiidæ*, a Family of Orthopterous Insects. P. Z. S. 1883, pp. 628–634, pl. lvi.

The author discovered numerous larvæ (apparently of *Oligotoma saundersi*, Westw.) living in society under bricks at Jubbulpore, in July, 1879; all had the anal parts asymmetric, and he considers they were all males. In October, near Calcutta, he found an insect (apparently *O. michaeli*, McLach.), utterly without wings, and also without asymmetry. This he considers a perfect ♀, and the only indication of that sex hitherto published, and is of opinion that the ♀ in the *Embiidæ* is always apterous. The abdomen in this consists of ten abdominal ventral tergites, but the 10th is hidden under the overlapping 9th. Between the 8th and 9th tergites, there is a large membranous whitish space, and in it is an aperture, which is considered to be the genital opening. Winged males of *O. saundersi* were afterwards captured, and in these he considers the genital aperture must lie behind the 9th tergite, and the anal segments and appendages are strongly asymmetric. The neuration of the wings is largely detailed, and what is considered the true subcostal nervure, in a somewhat rudimentary condition, but coalescing with the costal, is especially mentioned, former ideas on the homologies of neuration being erroneous. Finally, these insects are considered as undoubtedly true *Orthoptera*; and form the lowest, or lowest but one, of a series that includes *Acridioidea*, *Locustidæ*, &c., and have no near relationship to the *Perlidæ* on the one hand, nor to the *Termitidæ* on the other. Figs. 1–3, with details, concern the neuration; figs. 4 & 5 represent the abdomen of *O. saundersi*, above and beneath; fig. 6, the abdomen of the ♀ of *O. michaeli* beneath.

Embia antiqua, Pictet. Remarks on this amber insect by H. Lucas, Bull. Soc. Ent. Fr. (6) iii. p. xxvi.

Embia latreillii, Rambur, found at the base of the leaves of a *Cycas*, from Madagascar, received at Paris; the larva described; the latter lives in long silken galleries, open at either end; the perfect insect has also the power of spinning web: *id. l. c.* p. cvi.

Oligotoma insularis, sp. n., McLachlan, Ann. N. H. (5) xii. p. 227, Hawaiian Islands (and Antigua ?).

PSOCIDÆ.

AARON, S. FRANK. Description of new *Psocidæ* in the Collection of the American Entomological Society. Tr. Am. Ent. Soc. xi. pp. 37–40, pl. ix.

In addition to the new species, the European *Psocus 6-punctatus*, L., is noticed as occurring near Philadelphia.

Hagen, H. A. The Tarsal and Antennal Characters of *Psocidæ*. Ent. M. M. xix. pp. 12 & 13, and Psyche, iv. p. 52.

In *Atropina*, the young have only two-jointed tarsi, whereas in the adults they are three-jointed. So long as the larvæ have two-jointed tarsi, the antennæ have also fewer joints. Some genera (*Cœcilius*, &c.), commonly considered to have only two joints, possess a small aborted third joint, as occurs in many *Coleoptera*.

——. Beiträge zur Monographie der Psociden. Famille *Atropina*. S. E. Z. xliv. pp. 285–322. (The figures were published in S. E. Z. xliii. pl. ii.; *cf.* Zool. Rec. xix. *Ins.* p. 261.)

An elaborate monograph of the *Atropina*. The author admits the following genera, viz.:—*Atropos* (*A. divinatoria*, &c.), *Tropusia* (g. n. for *A. oleagina*, Hag.), *Clothilla* (for *C. pulsatoria*, &c.), *Lepi*[*do*]*notus* (for *L. inquilina*, Heyden, &c.), *Hyperetes* (for *H. guestfalicus*, Kolbe, &c.), *Sphæropsocus* (*S. kuenowi*, Hag.), and *Psoquilla* (*P. margine-punctata*, Hag.). The paper concludes with an analytical table of genera, and a lengthy historical and bibliographical dissertation on the "Death Watch" ("die Todtenuhr"), in which the question as to whether an audible sound may really be produced by these minute and soft *Atropina*, as by *Anobium*, is discussed. Interesting details on the geographical distribution of many of these insects are given. A condition of *Clothilla pulsatoria*, in which the imago possesses ocelli, is described. Linné's *Termes fatidicum* is resuscitated, and referred to the genus *Hyperetes*, but only from the original description. *Clothilla picea*, Mots., is transferred to *Lepi*[*do*]*notus*, the two genera being differentiated anew.

Kolbe, H. J. Ueber das Genus *Myopsocus* und dessen Species. Ent. Nachr. ix. pp. 141–146.

A discussion as to the affinities of the genus, with descriptions, partly reproduced, of 9 species, of which 1 is new.

——. Ueber die Racen des *Psocus taprobanes*, Hagen, in Ostindien. *L. c.* pp. 152–154.

The species is divided into 3 "races," viz.:—*taprobanes*, Hagen (Ceylon), *cosmopterus*, McLach. (Singapore and Malacca), and *bengalensis*, Kolbe (Bengal).

——. Ueber *Mesopsocus aphidioides*, Schrank, und *Elipsocus laticeps*, Kolbe. B. E. Z. xxvii. pp. 235–238.

Maintains the distinctness of these, and enters into long and minute redescriptions.

——. Neue Beiträge zur Kenntniss der Psociden der Bernstein-Fauna. S. E. Z. xliv. pp. 186–191.

Stated to be supplementary to Hagen's paper [*cf.* Zool. Rec. xix. *Ins.* p. 261], on amber species, from materials in Kühl's collection. An enumeration of these fossils is given, and also speculative calculations as to the comparative frequency, or otherwise, of certain groups in the amber period. *Elipsocus abnormis*, Hag., is considered to be a *Philotarsus*.

McLachlan, Robert. Remarks on certain *Psocidæ*, chiefly British. Ent. M. M. xix. pp. 181–185.

Clothilla annulata, Hag., formally introduced as British; McLachlan, *l. c.* p. 184.

Psœcus (*Neopsocus*) *rhenanus*, Kolbe, found by Eaton in Central Italy, under a stone where was a nest of a small ant. Remarks on the species, and its claims to generic or subgeneric rank; McLachlan, *l. c.* p. 181, woodcut.

Peripsocus albo-guttatus, Dalm., and *pupillatus* (Dale), Walker. McLachlan, *l. c.* pp. 182 & 183, points out that these names represent one and the same species, and that the species usually termed *albo-guttatus* is distinct; it is renamed *subpupillatus* (p. 183). The characters, distribution, &c., of the two species are detailed, with figures of an anterior wing of each.

Cœcilius obsoletus, *burmeisteri*, and *perlatus*: according to Kolbe, all these occur in Britain; McLachlan, *l. c.* pp. 183 & 184. *C. piceus*, Kolbe, in England; J. J. King, *op. cit.* xx. p. 142.

Mesopsocus unipunctatus and *Elipsocus laticeps*. McLachlan, *l. c.* p. 184, points out the narrow grounds on which these supposed species are separated by Kolbe, both specifically and generically, and shows that the chief neural character relied upon is common to both.

Elipsocus cyanops, Rostock, in Scotland; J. J. King, Ent. M. M. xx. p. 142.

New genera :—

Tropusia, Hagen, *l. c.* p. 296. Separated from *Atropos* on account of the condition of the eyes, the greater number of joints in the antennæ, &c. For *A. oleagina*, Hag.

Dorypteryx, Aaron, *l. c.* p. 37. Allied to *Psoquilla*, Hag., but with differently formed wings, slender femora, &c. *D. pallida*, sp. n., p. 38, pl. ix. figs. 2 & 3, Philadelphia.

New species, &c. :—

Atropos divinatoria var. n. *kidderi*, Hagen, *l. c.* p. 293, Kerguelen; var. n. *brunnea*, Aaron, *l. c.* p. 37, Philadelphia; *A. purpurea*, id. *ibid.* pl. ix. fig. 1, Philadelphia.

Hyperetes tessulatus, Hagen, *l. c.* p. 316, United States.

Psocus variabilis, p. 38, pl. ix. fig. 5, *inornatus*, p. 39, *atratus*, ibid. pl. ix. fig. 6, Philadelphia, and *speciosus*, p. 40, pl. ix. fig. 7, North Carolina [= *trifasciatus*, Provancher.—Rec.], Aaron, *l. c.*

Myopsocus novæ-zealandiæ, Kolbe, *l. c.* p. 145, Wellington, New Zealand.

Cœcilius definitus, Aaron, *l. c.* p. 38, pl. ix. fig. 4, Pennsylvania.

Elipsocus maculosus, id. *l. c.* p. 40, pl. ix. fig. 8, Philadelphia; *E. kuehli*, Kolbe, S. E. Z. xliv. p. 188, fossil in amber; *E. vinosus*, McLachlan, Ann. N. H. (5) xii. p. 228, Hawaiian Islands.

Philotarsus antiquus, Kolbe, S. E. Z. xliv. p. 187, fossil in amber.

Perlidæ.

Kolbe, H. J. Verzeichnis der *Perlidæ* Westfalens. JB. westf. Ver. xi. pp. 31–33.

A list of 24 species, with localities and general notes.

Ephemeridæ.

Eaton, A. E. A Revisional Monograph of Recent *Ephemeridæ*, or Mayflies. Part i. Tr. L. S. (2) iii. pp. 1–77, pls. i.–xxiv.

The commencement of this long-expected elaborate work. Part i. begins with introductory remarks; then follow chapters on the structure of adult *Ephemeridæ* in general, habits of the flies, oviposition and the egg, the young of the *Ephemeridæ*, characters which have been used as bases of classification, but which are not fundamental, history of classification, table of the classification adopted; after which the systematic portion is commenced. Each chapter is elaborated in a very minute manner. The author states that he has not found it necessary to depart in any material manner from the classification adopted by him in 1871. He divides the Family into 3 "Groups," 9 "Series," and 14 "Sections." Group I. is separated into 2 "Series" (i. comprising "Sections" of *Palingenia* and *Polymitarcys*; ii., "Section" of *Ephemera*). Group II. has 4 "Series" and 6 "Sections" (i., of *Potamanthus*; ii., of *Leptophlebia* and of *Ephemerella*; iii., of *Cænis* and of *Prosopistoma*; iv., of *Baetis*). Group III. has 3 "Series" and 3 "Sections" (i., of *Siphlurus* and of *Batisca*; ii., with one provisional "Section"; iii., of *Atopopus* and of *Ecdyurus*). The twenty-four plates are illustrative of details (chiefly generic) for the adult insects, and all after pl. viii. refer to genera to be treated upon in succeeding Parts. The systematic portion contained in Part i. refers to Group I. of the genera, and extends from *Palingenia* to *Pentagenia* in the following sequence:—*Palingenia* (subdivided into *Palingenia*, *Anagenesia*, and an unnamed subgenus, for ? *P. atrostoma*, Weber), *Oligoneuria*, *Elassoneuria*, *Spaniophlebia*, *Lachlania*, *Homœoneuria*, *Euthyplocia*, *Campsurus*, *Jolia*, *Polymitarcys*, *Hexagenia*, *Ephemera*, and *Pentagenia*. Plates i.–viii. refer respectively to—i., *Palingenia*; ii., *Palingenia* and *Jolia*; iii., *Oligoneuria*, *Elassoneuria*, *Spaniophlebia*, *Lachlania*, and *Homœoneuria*; iv., *Euthyplocia*; v., *Campsurus*; vi., *Campsurus* and *Polymitarcys*; vii., *Hexagenia*; viii., *Ephemera* and *Pentagenia*. The remaining plates will be referred to in succeeding Records.

Weyenbergh, H. Bijdrage tot de kennis der Zuid-Amerikaansche Ephemeriden. Tijdschr. Ent. xxvi. pp. 159–174, pl. x.

J. A. Palmén, Morph. JB. ix. pp. 1–8, gives interesting details on the double ("paarig") condition of the terminations of the sexual glands in *Ephemeridæ*, which are double not only in the larvæ in all stages, but also in the imagines, and in both sexes. Ordinarily, they are double the whole length, but occasionally transversely united in the 9th segment, still with double excretory ducts.

Hexagenia limbata, Pict., renamed *variabilis* ; Eaton, *l. c.* p. 55.

Ephemera decora, Hag., renamed *varia*; id. *l. c.* p. 69. *E. fasciata*, Hag. (Eaton, pt.), renamed *supposita* ; id. *l. c.* p. 72.

Polymitarcys virgo, L. Notes on enormous swarms at Aubigné, France, on the evenings of August 23rd to 25th ; E. Desmarest, Bull. Soc. Ent. Fr. (6) iii. p. cvii.

Anagensia, subg. n. of *Palingenia*, Eaton, *l. c.* p. 25. Differing from the restricted subg. of the latter name in neural and tarsal characters, &c. Includes *P. sibirica*, McLach., *lata*, Wlk., *ampla*, sp. n., p. 26, Sarawak, *javanica* and *tenera*, spp. nn., p. 27, Java, and *papuana*, Eaton.

New species :—

Palingenia nappi, Weyenbergh, *l. c.* p. 162, pl. x. fig. 2, Santiago; *P. feistmanteli*, Fritsch, Beitr. Pal. Oesterr.-Ung. ii. Heft 2, pl. i. figs. 1–6, fossil in Carboniferous of Bohemia.

Spaniophlebia pallipes, Eaton, *l. c.* p. 34, Ecuador.

Lachlania lucida, id. *l. c.* p. 35, Guatemala.

Euthyplocia anceps, id. *l. c.* p. 38, Amazons.

Hexagenia mexicana, p. 50, Mexico, *munda*, p. 53; N. Carolina, and *venusta*, p. 54, Texas and Utah, *id. l. c.*

Ephemera wappæi, p. 159, pl. x. fig. 1, Cordova, and *holmbergi*, p. 160, Buenos Aires, Weyenbergh, *l. c.*

Cloe sellacki, p. 164, pl. x. fig. 3, Argentine Republic, *lorentzi*, p. 167, pl. x. fig. 4, Buenos Aires, *siewerti* and *stelzneri*, p. 170, Argentine Republic, and ? *vogleri*, p. 171, pl. x. fig. 5, Argentine Republic, *id. l. c.*

Oxycypha oldendorffi, id. *l. c.* p. 173, pl. x. fig. 6, Argentine Republic.

Odonata.

Amans, P. Essai sur le vol des Insectes. Rev. Montp. (3) ii. pp. 470–490, pl. xi.

An anatomical and mechanical study of the flight of *Æschna*, drawn up specially with regard to the construction of a flying machine constructed on the same principles, and worked by electricity. (The Recorder would remark that the wings figured on pl. xi. are not those of an *Æschna*, but belong to some species of *Libellulina*.).

Marquet, C. Coup d'œil sur les insectes Névroptères Odonates (Libellulidées) qui frequentent le Canal du Midi et ses abords, notamment à Toulouse. Bull. Soc. Toulouse, xvii.

General notes on habits and times of appearance, followed by a list of 36 species, with special localities. (Separate copy only seen.)

Selys-Longchamps, E. de. Les Odonates du Japon. Ann. Ent. Belg. xxvii. pp. 82–143.

A memoir commenced, as the author says, more than forty years ago, and now brought to a conclusion owing to the recent important discoveries of Lewis, Pryer, and Milne. 67 species enumerated, of which 24 are new. The author considers Japan as coming within the palæarctic zoo-geographical province. Of the 67 species, 8 are known palæarctic

forms, 6 are scarcely more than races of European and Siberian forms, 16 have completely European facies, the remainder belonging to the eastern subtropical division. There are 19 *Libellulina*, 5 *Corduliina*, 10 *Gomphina*, 10 *Æschnina*, 6 *Calopterygina*, and 17 *Agrionina*. An appendix notices a few species from North China, &c.

A brief notice of the fossil *Odonata* of the Florissant and Green River Tertiaries is given by Scudder in P. Bost. Soc. xxi. p. 409. All the Green River forms pertain to the Légion *Podagrion*, whereas those from Florissant are divided between "*Podagrion*" and "*Agrion*." All are decidedly subtropical in facies.

Libelullina:

Brauer, Friedrich. Zur näheren Kenntniss der Odonaten-Gattungen *Orchithemis*, *Lyriothemis*, und *Agrionoptera*. SB. Ak. Wien, lxxxvii. pp. 85–91.

An amplification of the author's views as to the characters and limits of these genera, and especially with regard to the transference, by De Selys, of certain species of *Agrionoptera* to *Orthemis*. Tabular characters are given for a natural group of genera, composed of (1) *Lyriothemis* and *Orchithemis*, (2) *Agrionoptera* and *Uracis*, (3) *Neurothemis*, (4) *Orthemis*.

Orchithemis, *Calothemis*, and *Lyriothemis*. De Selys, Ann. Ent. Belg. xxvii. pp. 142 & 143, replies to Brauer's criticisms (vide *suprà*), and is of opinion that if it be thought convenient to retain these divisions as distinct, they may be constituted as follows:—*Orchithemis* should include *pulcherrima*, Brauer, and *pruinans*, Selys; in *Calothemis* should be placed *bivittata*, Rbr., and *meyeri* and *biappendiculata*, Selys; *Lyriothemis* comprises *acigastra*, *pachygastra*, *lewisii*, *elegantissima*, *priapea*, and *magnifica*, Selys, and *cleis*, Brauer.

Libella albistyla, Selys. De Selys, *l. c.* pp. 101–103, considers *albistyla* (Europe, China, and Japan), *albicauda*, Brauer (China), and *speciosa*, Uhler (China and Japan), scarcely distinct as varieties. *L. zonata*, Burm. (with a variety), redescribed; *id. l. c.* p. 20.

Libellula quadrimaculata. A further note on the notorious migration of this species is given by A. Newton, Nature, xxviii. p. 271, from observations made at Malmö in Sweden. (*Cf.* also Ent. M. M. xx. p. 88).

W. A. Buckhout details the movements, &c., accompanying oviposition in *Diplax rubicundula*; Am. Nat. xvii. p. 548.

New species:—

Rhyothemis fuliginosa (Hagen, MS.), p. 88, Japan and Shanghai, race *plutonia*, p. 89, Bengal, Selys, *l. c.*

Diplax infuscata and *erotica*, p. 90, *fastigiata* (var. of *erotica*), *uniformis*, p. 92, *frequens*, p. 93, *croceola*, p. 94, all from Japan, *corduligastra* (for which, with *erotica*, the generic term *Thecadiplax* is provisionally proposed), p. 139, Amur and China, *sinensis*, p. 140, Central China, *orientalis*, ibid., Darjeeling and China, and *exul*, p. 96 (noticed), S. Africa, *id. l. c.*

Lyriothemis lewisi, p. 96, Japan, and *elegantissima*, p. 141, China, Selys, *l. c.*
Libellula angelina, id. *l. c.* p. 99, Japan.
Libella melania, id. *l. c.* p. 103, Japan.
Trithemis phaon, p. 106, and ab. *dispar*, p. 107, Japan and China, *id. l. c.*
Lepthemis blackburni, McLachlan, Ann. N. H. (5) xii. p. 229, Hawaiian Islands.

Corduliina.

Syncordulia atrifrons, sp. n., McLachlan, C.R. ent. Belg. xxvii. p. xc., Queensland.

Somatochlora atro-virens, p. 108, and (?) *marginata*, p. 109, Japan, spp. nn., Selys, Ann. Ent. Belg. xxvii.

Æschnina.

McLachlan, Robert. Two New Species of *Anax*, with notes on other Dragon-flies of the same genus. Ent. M. M. xx. pp. 127–131.

Selys-Longchamps, E. de. Synopsis des Æschnines. Première partie : Classification. Bull. Ac. Belg. (3) v. pp. 712–748. Also separately, Brussels, 1883, 8vo, pp. 1–40. (The indications are given from the separately-published form, which is the best known.)

Generic and subgeneric only. The author places the (about) 150 known species in 5 "genera" and 23 "subgenera," divided principally according to the forms of the eyes, the condition of the anal angle of the inferior wings in the males, the terminal abdominal segment in the females, the sub-costal nervure, the basal area, &c. The 5 "genera" are as follows:—*Anax* (with 2 "subgenera" and 23 species), *Æschna* (with 13 and 81), *Telephlebia* (with 2 and 4), *Gynacantha* (with 4 and 33), and *Staurophlebia* (with 2 and 8). A tabular arrangement of the larger divisions, and a geographical summary, are given.

Anax includes *Hemianax*, Selys (*Æ. ephippigera*, Burm.), and *Anax*, Leach (*A. formosus*, &c.). *Æschna* includes *Anaciæschna*, Selys (*A. iaspidea*, Burm.), *Æschna*, F. (*juncea*, L., &c.), *Epiæschna*, Hag. (*Æ. heros*, Say), *Brachytron*, Evans (*Æ. pratensis*, Müll.), *Acanthæschna*, Selys (undescribed Australian species), *Austroæschna*, Selys (*A. parvistigma*, Selys), *Gomphæschna*, Selys (*Gyn. furcillata*, Say), *Allopetalia*, Selys (*A. pustulosa*, Selys, and *Æ. armata*, Hag.), *Basiæschna*, Selys (*Æ. janata*, Say), *Fonscolombia*, Selys (*Æ. irene*, Fonsc., &c.), *Amphiæschna*, Selys (*Æ. ampla*, Hag.), *Calliæschna*, Selys (*Æ. microstigma*, Schnd.), and *Cephalæschna*, Selys (*C. orbifrons*, Selys). *Telephlebia* includes only *Telephlebia*, Selys (*T. godeffroyi*, Selys). *Æschnophlebia*, Selys, is also based on a single subgenus, and on 3 new Japanese species. *Gynacantha*, Ramb., includes *Tetracanthagyna*, Selys (*G. plagiata*, Waterh.), *Triacanthagyna*, Selys (*G. trifida*, Rbr.), *Gynacantha*, Rbr. (*G. nervosa*, Rbr., &c.), and *Heliæschna*, Selys (*H. fuliginosa*, Selys). *Staurophlebia*, Brauer, includes *Neuræschna*, Selys (*Æ. costalis*, Burm.), and *Staurophlebia*, Brauer (*Æ. reticulata*, Burm., &c.).

Anax longipes, Hagen. McLachlan, *l. c.* p. 129, has notes on the supposed example of this in the Science and Art Museum, Dublin.

Anax tristis, Hag., and *A. goliath*, Selys. McLachlan, *l. c.* p. 139, remarks on these, and is inclined to the opinion that they represent ♀ and ♂ of one species.

Anax julius, Brauer. De Selys, Ann. Ent. Belg. xxvii. p. 116, considers this a variety, scarcely distinct, of *A. parthenope*, Selys.

Æschna arundinacea, Selys. A ♂, presumably of this species, from Japan; *id. l. c.* p. 117.

New genera and subgenera :—

Hemianax (subg. of *Anax*), Selys, *l. c.* p. 15 (= *Cyrtosoma*, Chp., preoccupied).

Epiæschna (Hagen, subg. of *Æschna*), id. *l. c.* p. 21. Type, *Æ. heros*, F.

Acanthæschna (subg. of *Æschna*), id. *l. c.* p. 23. Types, *A. victoria* and *unicornis*, spp. nn., undescribed.

Austroæschna (subg. of *Æschna*), id. *l. c.* p. 24. Type, *A. parvistigma*, sp. n., New Holland, indicated.

Basiæschna (subg. of *Æschna*), id. *l. c.* p. 27. Type, *Æ. janata*, Say.

Fonscolombia (subg. of *Æschna*), id. *l. c.* p. 28 (*cf.* also *id.* Ann. Ent. Belg. xxvii. p. 124). Types, *Æ. irene*, Fonsc., *F. maclachlani*, Selys, and *Æ. vinosa*, Say.

Calliæschna (subg. of *Æschna*), id. *l. c.* p. 30. Type, *Æ. microstigma*, Schnd.

Cephalæschna (subg. of *Æschna*), id. *l. c.* p. 31. Type, *C. orbifrons*, sp. n., Bengal, indicated.

Telephlebia (g. & subg. n.), *id. l. c.* p. 33 (*cf.* also Ann. Ent. Belg. xxvii. p. 122). Type, *T. godeffroyi*, sp. n., *ibid.*, New South Wales.

Æschnophlebia (subg. of *Telephlebia*), id. *l c.* p. 34 (*cf.* also Ann. Ent. Belg. *ibid.*). Types, *Æ. optata*, *longistigma*, and *anisoptera*, Selys.

Tetracanthagyna (subg. of *Gynacantha*), id. *l. c.* p. 36. Type, *G. plagiata*, Waterhouse.

Triacanthagyna (subg. of *Gynacantha*), id. *l. c.* p. 37. Type, *G. trifida*, Rbr.

New species :—

Anax walsinghami, p. 127, California and Guatemala, and *rutherfordi*, p. 128, Sierra Leone, McLachlan, *l. c.*

Æschna melanictera, p. 119, and *milnii*, p. 120, Japan, Selys, Ann. Ent. Belg. xxvii.

Æschnophlebia optata, p. 122, *longistigma* and *anisoptera*, p. 123, Japan, *id. l. c.*

Fonscolombia maclachlani, id. *l. c.* p. 126, Japan.

Gomphina.

Sieboldius japonicus, Selys, probably inhabits Borneo, and not Japan; Selys, Ann. Ent. Belg. xxvii. p. 115.

New species :—

Gomphus pryeri, Selys, *l. c.* p. 111, Japan; *G. excelsus*, Costa, Atti Acc. Nap. (2) i. [1883] (*cf.* Bull. ent. Ital. xv. p. 333, 1883 [1884]), Sardinia.

Calopterygina.

Calopteryx japonica, Selys, is considered only a race of *C. virgo*, L.; Selys, Ann. Ent. Belg. xxvii. p. 128.

Mnais costalis, Selys, *andersoni* (McLach.), Selys, and *strigata*, Hag., are probably only races of *pruinosa*, Selys; *id. l. c.* p. 129.

Agrionina.

Megalagrion, g. n., McLachlan, Ann. N. H. (5) xii. p. 237. Of the Légion *Agrion*. Differs from all other genera (or "subgenera"), excepting *Hyponeura*, in possessing two rows of post-costal cellules. *M. blackburni*, p. 238, and *oceanicum*, p. 239, Hawaiian Islands, spp. nn. Following the descriptions of the above are critical notes on all the Hawaiian *Agrionina*, which, notwithstanding marked differences *inter se*, appear to constitute a special group, the materials for which do not readily fall into the latest systematic ideas on classification; p. 240.

New species:—

Lestes japonica, Selys, *l. c.* p. 130 (= *barbara*, var.?), Japan.

Enallagma circulatum, id. *l. c.* p. 133, Japan.

Agrion sexlineatum, p. 135, and *quadrigerum*, p. 136, Japan, *id.* l. c.; *A.* (?) *hawaiiense*, p. 232, *pacificum*, p. 234, *deceptor*, p. 235, and *calliphya*, p. 236, Hawaiian Islands, McLachlan, *l. c.*

ORTHOPTERA.

BY

ROBERT MCLACHLAN, F.R.S., F.L.S., &c.

THE GENERAL SUBJECT.

AMANS, P. Essai sur le vol des Insectes. Rev. Montp. (3) ii. pp. 121–139. pls. iii. & iv.

See *Odonata*, ante, p. 263. Observations drawn up chiefly from a species of exotic *Locustidæ* (*Meconema*?). Worked out in the same manner as the previous paper, and towards the same end, viz., the construction of a flying machine, which the author considers perfectly practicable if due regard be taken of the mechanism as existing in insects.

BORMANS, A. DE. Spedizione Italiana nell' Africa Equatoriale. Risultati Zoologici. Ortotteri. Parte seconda. Ann. Mus. Genov. xviii. pp. 704–708. (*Cf.* also Mem. Soc. Geogr. Ital. ii. pp. 704–708.)

Additional notes on 14 species of various families.

Brunner von Wattenwyl, C. Ueber hypertelische Nachahmungen bei den Orthopteren. Verh. z.-b. Wien, xxxiii. pp. 247–250, pl. xv.

Concerns cases of mimicry in 2 genera of *Locustidæ*, one of which (new) mimics ants, and the other (*Pterochroza*) decaying leaves.

Corelli, R. Gli Ortotteri genuini de Trentino: Notizie preliminari. Mus. civico di Rovereto. Rovereto: 1883.

Not seen by Recorder; appears to be a local list of 84 species. (*Cf.* Bull. Ent. Ital. xv. p. 190.)

Finot, A. Les Orthoptères de la France. Paris: 1883, 8vo, pp. 1–199, 1 pl.

Adapted from Brunner von Wattenwyl's "Prodromus" [*cf.* Zool. Rec. xix. *Ins.* p. 270], so far as the French species are concerned, but with much original local information. No descriptions given, but Brunner's tables are mostly reproduced. 160 species are noticed, viz.: 17 *Forficularia*, 11 *Blattodea*, 6 *Mantodea*, 2 *Phasmodea*, 58 *Acridiodea*, 50 *Locustodea*, and 16 *Grillodea*. The volume concludes with copious directions for collecting and preserving, largely illustrated by woodcuts, and a glossary. The plate is explanatory of structural terminology. Reviewed in Le Nat. xv. pp. 367 & 368.

Gerstäcker, A. Beitrag zur Kenntniss der Orthopteren-Fauna Guinea's, nach den von R. Buchholz während der Jahre 1872 bis 1875 daselbst gesammelten Arten. Erster Theil. MT. Vorpomm. xiv. pp. 39–102.

70 species (many new) are noticed or described in this first part, viz.: 9 *Forficulidæ*, 40 *Blattidæ*, 17 *Mantidæ*, and 4 *Phasmatidæ*.

Krauss, H. Neuer Beitrag zur Orthopteren-Fauna Tirol's, mit Beschreibung zweier neuer *Pezotettix*-Arten. Verh. z.-b. Wien, xxxiii. pp. 219–224, woodcuts.

Additional species noted for the district.

Packard, A. S., Jun. The Systematic Position of the *Orthoptera* in Relation to other Orders of Insects. Rep. U. S. Ent. Comm. iii. pp. 286–345, pls. xxiii.–lxiv. For abstracts, *cf.* Am. Nat. xvii. pp. 820–829, 932–935, & 1134–1138, and Ann. N. H. (5) xii. pp. 145–154.

An ingenious attempt to overcome the notorious classificational difficulty occasioned by the Linnean Order *Neuroptera*. As a result of original and "unbiassed" personal investigations of all the components of the Linnean *Neuroptera* and *Orthoptera*, the author unites them into a "Superorder," *Phyloptera*, consisting of four "Orders," viz.: *Dermatoptera*, Burm., *Orthoptera*, L., *Pseudoneuroptera*, Erichson, and *Neuroptera*, L. (as restricted by Erichson). The *Dermatoptera* consist of the *Forficulidæ*, only; the *Orthoptera* are divided into *Blattariæ*, *Mantidæ*, *Phasmida*, *Acrydii*, *Locustariæ*, and *Gryllidæ*; *Pseudoneuroptera* comprise three "Suborders," viz.: *Corrodentia* (*Perlidæ*, *Psocidæ*, and *Termitidæ*), *Odonata*, and *Ephemerina*; *Neuroptera* consists of two "Suborders," viz.: *Planipennia* and *Trichoptera*, as commonly defined. At p. 295, a genealogical tree of Hexapod Insects is given, showing their presumed com-

mon origin from a hypothetical Thysanuran type, and their almost immediate branching off into *Metabola* and *Ametabola*. The definitions of external anatomy are very full, and the multitudinous figures on the very numerous plates help greatly to elucidate them.

PANCIC, J. *Orthoptera* in Serbia hucdum detecta. Belgrade: 1883, 8vo, 172 pp.

Not seen by Recorder. According to a notice in Le Nat. v. p. 334, it is entirely in the vernacular, and drawn up on the plan of Brunner's "Prodromus."

PICAGLIA, L. Contribuzione allo studo degli Ortotteri del Modenese. Atti Soc. Nat. Modena, 1883.

Not seen by Recorder. A list of 44 species. (*Cf.* Bull. Ent. Ital. xv. p. 190.)

TARGIONI-TOZZETTI, A. Ortotteri agrari. Florence-Rome: 1882.

Not seen by Recorder. The abbreviated title of an official report in the "Annali di Agricoltura, pubblicati dal Ministero di agricol. indus. e comm." (*Cf.* Bull. Ent. Ital. xv. pp. 198 & 199. Reviewed by Finot in Le Nat. v. p. 263.)

A list of 20 species, of various families, from Rouge-Cloître, in Belgium, is given by De Bormans in C.R. ent. Belg. xxvii. pp. xx.–xxiii.

A list of about 40 species (some new) of all families taken in Calabria in 1876 is given by A. Costa in Atti Acc. Nap. ix. No. 4, pp. 51 & 52.

Notes on the sternal muscles of various *Orthoptera* (and *Neuroptera*) by Constantin Luke are given in Jen. Z. Nat. xvi. pp. 531–533.

Targioni-Tozzetti's notes on the male anal appendages of saltatory *Orthoptera* [cf. Zool. Rec. xix. *Ins.* p. 271], abstracted and translated in J. R. Micr. Soc. (ii.) iii. p. 206.

FORFICULIDÆ.

BORMANS, A. DE. Étude sur quelques Forficulaires nouveaux ou peu connus, précédée d'un tableau synoptique des genres de cette famille. Ann. Ent. Belg. xxvii. pp. 59–90, pls. ii. & iii.

The "tableau synoptique" ("Divisio generum") gives the characters of 27 genera, none new, but some are used in a restricted sense. *Condylopalama* and *Typholabia*, Scudder, are considered very doubtful, based upon larvæ. 22 species are noticed, one-half new. There are notes (and figures) on the following known species, viz.:—*Anisolabis laticentris*, Phil. (p. 62, fig. 3), *Brachylabis chilensis*, Blanch. (p. 65, fig. 5), *Mecomera brunnea*, Serv. (p. 71, fig. 10), *Labia chelidiuroides*, Borm. (p. 74, fig. 12), *L. rotundata*, Scud. (p. 75, fig. 13), *Ancistrogaster luctuosa*, Stål (p. 83), *Forficula bicuspis*, Stål (p. 85, fig. 19), *F. lugubris*, Dohrn (p. 87, fig. 21), *Anechura ancylura*, Dohrn (p. 88, fig. 22).

Forficula orsinii, Géné, noticed by Costa from Calabria; Atti Acc. Nap. ix. No. 4, p. 38, pl., fig. 10.

New species :—

Cylindrogaster abnormis, Bormans, *l. c.* p. 60, fig. 1, Java.

Psalis colombiana, id. *l. c.* p. 61, fig. 2, Colombia.

Anisolabis javana, id. *l. c.* p. 63, fig. 4, Java.

Platylabia javana, id. *l. c.* p. 65, fig. 6, Java.

Sparatta colombiana, p. 66, fig. 7, Colombia, *australica*, p. 68, fig. 8, Queensland, and *brunneri*, p. 69, fig. 9, N. Australia, *id. l. c.*

Labia mexicana, id. *l. c.* p. 73, fig. 11, Mexico.

Spongophora similis, id. *l. c.* p. 76, fig. 14, Colombia.

Chelisoches pulchripennis, id. *l. c.* p. 78, fig. 15, India ; *C. pulchella*, Gerstäcker, MT. Vorpomm. xiv. p. 42, Cameroons.

Neolobophora ova, Bormans, *l. c.* p. 80, fig. 16, Madagascar.

Ancistrogaster panamensis, p. 81, fig. 17, Panama, and *aterrimus*[*-ma*], p. 83, fig. 18, Ecuador, *id. l. c.*

Forficula versicolor (*speculigera*, Stål ?), *id. l. c.* p. 86, fig. 20, Bogotá ; *F. protensa*, Gerstäcker, *l. c.* p. 45, Gold Coast, and *pederina*, id. *ibid.*, Cameroons ; *F.* (*Apterygia*) *apennina*, p. 36, pl., fig. 7, *F.* (*A.*) *silana*, p. 38, pl., fig. 8, and *F.* (*A.*) *laminigera*, p. 38, pl., fig. 9, Calabria, Costa, Atti Acc. Nap. ix. No. 4.

Blattidæ.

Kliver, Moritz. Ueber einige neue Blattinarien-, zwei *Dictyoneura*- und zwei *Arthropleura*-Arten, aus den Saarbrücker Steinkohlenformation. Palæontogr. xxix. pp. 251–267.

Concludes with a list of insect remains from the Middle and Upper Carboniferous and Lower Dyas.

Koestler, Max. Ueber das Eingeweidenervensystem von *Periplaneta orientalis*. Z. wiss. Zool. xxxix. pp. 572–594, pl. xxxiv.

An elaborate essay on the nervous system, purely anatomical and developmental.

Scudder, Samuel H. A new and unusually perfect Carboniferous Cockroach from Mazon Creek, Ill. P. Bost. Soc. xxi. pp. 391–396.

Hermatoblattina wemmetsweileriensis, Goldbg., p. 256, pl. xxxiv. fig. 4, and *Blattina intermedia* and *Gerablattina intermedia*, p. 257, pl. xxxv. fig. 2, noticed and figured ; Kliver, *l. c.*

Eustegasta, g. n., Gerstäcker, MT. Vorpomm. xiv. p. 53. Differentiated from *Epilampra*. Type, *E. buprestoides*, Walker.

New species :—

Periplaneta agaboides, p. 47, *manca*, p. 48, and *anthracina*, p. 49, Cameroons, Gerstäcker, *l. c.*

Deropeltis dichroa, p. 50, Gold Coast, *carbonaria*, p. 51, and *robusta*, p. 52, Cameroons, *id. l. c.*

Epilampra lyncea, p. 53, and *erabesceus*, p. 54, *id. l. c.*, W. Africa.

Anaplecta cincta, id. *l. c.* p. 56, Ogowé.

Phyllodromia parenthesis, p. 57, Ogowé, *hemerobina*, ibid., *centralis*, p. 58,

pustulosa, p. 59, *patricia*, p. 60, *pulchella*, p. 61, *cinnamomea*, p. 62, and *basalis*, p. 63, Cameroons, *punctifrons*, p. 63, Cameroons and Gaboon, *ægrota*, p. 64, Ogowé, *relucens*, p. 65, Ogowé, *obsoleta*, p. 65, Gold Coast, and *amplicollis*, p. 66, Gaboon, Gerstäcker, *l. c.*

Nauphœta frenata, id. *l. c.* p. 67, Ogowé.

Panchlora adusta, p. 69, and *vitellina*, p. 70, *id. l. c.*, Cameroons.

Gyna capucina (= *maculipennis*, Brunn., *nec* Schaum), p. 72, Bonjongo, and *buchholzi*, ibid., Fernando Po and Cameroons, *id. l. c.*

Derocalymma (*Cyrtotria*) *scabricollis*, id. *l. c.* p. 34, Gaboon.

Perispharia (*Melanosilpha*) *oniscina*, id. *l. c.* p. 75, Cameroons.

Anthracoblattina camerata, p. 252, pl. xxxiv. fig. 1, and *incerta*, p. 253, pl. xxxiv. fig. 2, Kliver, *l. c.*, fossil at Saarbrück.

Petroblattina subtilis, id. *l. c.* p. 254, pl. xxxiv. fig. 1, fossil at Saarbrück.

Gerablattina robusta, id. *l. c.* p. 255, pl. xxxiv. fig. 3, fossil at Saarbrück.

Etoblattina propria, id. *l. c.* p. 258, pl. xxxv. fig. 3, fossil at Saarbrück; *E. mazona*, Scudder, *l. c.* p. 391, fossil in Illinois.

[Saussure, H. de. Mémoires pour servir à l'histoire naturelle du Mexique, des Antilles, et des États-Unis. Orthoptères de l'Amérique moyenne. Famille des Blattides. Genève : 1864, pp. 279, 2 pls.

This very important memoir is noticed at the request of the author. It escaped notice in the early vols. of the Zool. Rec. (which commenced with the year 1864), and also in the German "Bericht." It would also appear to have escaped the notice of workers on *Blattidæ* generally, for none of the new terms employed therein for generic, &c., divisions, are included in Scudder's just published laborious "Universal Index," which extends down to 1879. Such, then, is the excuse for briefly noticing a memoir published twenty years ago, which notice must be limited to an enumeration of the "new genera and species," thus leaving without indication the many and important chapters on anatomy, habits, and classification comprised in the first 46 pp. 138 species (some new) are described.

New genera, &c. :—

Cacerlaca, p. 71 (a new rendering of "*Kakerlac*"), for the section of *Periplaneta* that includes *P. americana* and allies.

Hololampra, p. 94, a "division" of *Blatta*.

Ellipsidium, g. n., p. 118, for *Thyrsocera australis*, Sauss., &c.

Notolampra, p. 139, a group of *Epilampra*, for *E. lucida*, Sauss.

Planes, p. 141, a group of *Epilampra*, for *E. cribrata*, Sauss.

Thorax, p. 143, a group of *Phoraspis*, for *P. porcellana*, Sauss.

Plectoptera, g. n., p. 173, for *P. porcellana*, sp. n., p. 176, Cuba.

Diploptera, g. n., p. 177, for *D. silpha*, Sauss., from Australia, introduced comparatively.

Tribonium, p. 208, a "division" of *Proscratea*, for *Blatta conspersa*, Guérin.

Tribonidium, p. 210, a "division" of *Zetobora*, for *Z. monastica*, Sauss.

Homœogryllus xanthographus, Guérin. Remarks on a specimen from Abyssinia; H. Lucas, Bull. Soc. Ent. Fr. (6) iii. p. xcv.

Locustidæ.

Kraus, F. Beobachtung über das Zirpen der Höhlenheuschrecke (*Troglophilus cavicola*, Kollar). SB. z.-b. Wien, xxxiii. p. 15.

The insect heard to stridulate in the breeding season in a cave near Gams, in Styria.

Conocephalus. Notes on a species captured in a greenhouse near London, with remarks on its habits (which were carnivorous) in confinement; T. R. Billups, P. E. Soc. 1883, p. 1. Afterwards identified as *Copiophora cornuta*, De G.; *id. l. c.* p. 3.

Phaneroptera falcata, Scop., captured in Cornwall; C. O. Waterhouse & P. B. Mason, P. E. Soc. 1883, p. 31.

Anabrus. L. Bruner gives additional notes on the "Western Cricket"; Rep. U. S. Ent. Comm. iii. pp. 61–64.

Brunner von Wattenwyl, Verh. z.-b. Wien, xxxiii. pp. 247–250, notes the similarity of various species of *Pterochroza* to dead leaves, and in connection therewith notices (and figures the wings of) *P. colorata*, Serv., pl. xv. fig. 3, and *deflorata* (fig. 2), *arrosa* (fig. 4), and *infecta* (fig. 5), Brunner.

Myrmecophana, g. n., *id. l. c.* p. 248 A minute (larval?) form mimicking ants. *M. fallax*, sp. n., *ibid.* pl. xvi. figs. 1*a–d*., Soudan.

Mecopoda abbreviata, sp. n., Taschenberg, Z. Naturw. lvi. p. 184, Socotra.

Ctenodecticus costulatus, sp. n., Costa, Atti Acc. Nap. (2) i. [1883]; *cf.* Bull. Ent. Ital. xv. p. 332 [1884], Sardinia.

Pœcilimon orbelicus, sp. n., Pancic, Orthop. Serb. 1883 (*cf.* ante, p. 269), Servia.

Acridiidæ.

Bruner, Lawrence. The Rocky Mountain Locust in 1880 (pp. 8–20), and in Wyoming, Montana, &c., in 1881 (pp. 21–52). Rep. U. S. Ent. Comm. iii.

——. List of Known Species of Locusts in North America. *L. c.* pp. 53–61.

Enumerates 273 described species of *Acridiidæ* from north of Mexico.

Packard, A. S., Jun. The Embryological Development of the Locust. Rep. U. S. Ent. Comm. iii. pp. 263–286, pl. xvi.–xxi.

Concerns insects in general, and *Caloptenus spretus* in particular. It may be specially noted that the author combats Gegenbaur's theory that wings are tracheal expansions, and agrees with Newport that the head of an insect is composed of four segments only. (*Cf.* also Am. Nat. xvii. pp. 1134–1138.)

RILEY, C. V. Additions to the Chronology of Locust Ravages. Rep. U. S. Ent. Comm. iii. pp. 3–7.

Concerns Texas and Utah in 1880 and 1881.

SWINTON, A. H. Data obtained from Solar Physics and Earthquake Commotions applied to elucidate Locust Multiplication and Migration. Rep. U. S. Ent. Comm. iii. pp. 65–85.

An attempt to correlate the epochs of locust-swarms with the commencement of periods of minimum sun-spots, in connection with which the author examines into the period of occurrence of certain usually rare *Lepidoptera* in the United Kingdom. Two lengthy tables are given in support of the author's views. "Notes on Locusts in Britain," by the same author, are given; *l. c.* App. viii. pp. 57 & 58.

Caloptenus differentialis and *C. femur-rubrum* attacked by a parasitic fungus, which fills them with small spherical bodies, and which Bessey terms *Entomophthora calopteni*; H. Osborn, Am. Nat. xvii. pp. 1286 & 1287. Riley, however, is of opinion that the fungus only succeeds the attacks of insect-parasites; *tom. cit.* p. 1287.

General notes on locust ravages in Russia, Japan, China, Cape Colony, India, &c., are given in Rep. U. S. Ent. Comm. iii. App. pp. 59–81.

Acridium succinctum, L., causing damage in the Deccan and other parts of India; W. F. Kirby, P. E. Soc. 1883, p. 4.

New species :—

Pezotettix baldensis, p. 220, fig. 1, Monte Baldo, and *cobellii*, p. 222, fig. 2, Roverdo, Krauss, Verh. z.-b. Wien, xxxiii.

Pezotettix flavo-annulatus, La Munyon, Pr. Nebraska Ass. Adv. Science, 1877, and *Caloptenus sanguinocephalus*, id. *l. c.* [These indications are from Psyche, iv. p. 172, and are there quoted from a "separate only."]

RHYNCHOTA.

BY

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

The General Subject.

Berg, C. Addenda et Emendanda ad *Hemiptera* Argentina. An. Soc. Arg. xv. pp. 193–217 & 241–269, & xvi. pp. 5–32,73–87, 105–133, 180–191, 231–241, & 285–294.

168 species are noticed, to the end of the *Membracidæ*, the series of papers not being quite completed in 1883. Many new genera and species are described, and observations on the affinities of the former, by Reuter, are frequently added.

D'Antessanty, G. L'Étude des Hémiptères. Feuill. Nat. iii. pp. 40–43, 60–63, 75, & 76.

Chiefly consists of notes on the habits of the various families, with general observations, and instructions for collecting and preserving.

Geise, O. Die Mundtheile der Rhynchoten. Arch. f. Nat. xlix. pp. 315–373, pl. x.

The bulk of this paper consists of minute anatomical details, not admitting of abridgement. The plate represents sections of the head and proboscis of *Notonecta glauca*, *Nepa cinerea*, and *Corixa striata*.

Lethierry, L. Spedizione Italiana nell' Africa equatoriale. Resultati Zoologici : Emitteri. Parte Seconda. Ann. Mus. Genov. xviii. pp. 741–756, and Mem. Geogr. Ital. ii. 3, pp. 53–68.

54 species are mentioned from Shoa, including several new ones.

Reuter, O. M. Rättelser till nya bidrag till Åbo och Ålands skärgård Hemipter-fauna. Medd. Soc. Fenn. vii. [1881] pp. 190 & 191.

Captures of *Hemiptera* near Birmingham ; Blatch, Ent. M. M. xx. p. 19.

List of new or rare *Hemiptera* of Alsace and the Vosges ; Puton, Bull. Soc. Colmar, xxii. & xxiii. p. 253.

Captures of *Hemiptera* on the Simplon ; Rosset, Bull. Soc. Murith. ix. p. 38.

List of *Rhynchota* from Mergui ; Distant, Ann. N. H. (5) xi. pp. 169–172.

List of *Hemiptera* (2 new) collected by Comotto in Burma ; Lethierry, Ann. Mus. Genov. xviii. pp. 649 & 650.

Localities, food-plants, &c., of various *Hemiptera*: Puton, Rev. d'Ent. ii. pp. 285 & 286; Löw, Wien. ent. Z. ii. pp. 57–62 ; and Nordin, Ent. Tidskr. iv. pp. 133 & 134.

Cimex and *Acanthia*. Use of these names discussed ; Douglas, Ent. M. M. xix. pp. 202 & 203.

HEMIPTERA-HETEROPTERA.

Distant, W. L. Biologia Centrali-Americana [*cf.* Godman, F. Ducane, & Salvin, O., *Insecta*, General Subject]. *Rhynchota Heteroptera*, pp. 215–264, pls. xx.–xxiii.

Extends from *Theraneis* to *Paracalocoris*.

——. First Report on the *Rhynchota* collected in Japan by G. Lewis. Ent. M. M. 1883, pp. 413–443, pls. xix. & xx.

109 species (33 new) belonging to the *Pentatomidæ*, *Coreidæ*, *Lygæidæ*, and *Pyrrhocoridæ*, are enumerated; 4 new *Reduviidæ* are also described. 9 European species of the first four families occur in Japan ; these are all widely distributed, and in Japan they attain an unusually large size. There is much less affinity between the Japanese and Amur faunæ than might have been expected.

Fokker, A. J. F. Catalogus der in Nederland voorkomende *Hemiptera*. Eerste gedeelte : *Hemiptera-Heteroptera*. Tijdschr. Ent. xxvi. pp. 234–250.

Extends to the *Berytidæ*, and includes several species new to the fauna.

Horváth, G. *Heteroptera* Anatolica in regione Brussæ collecta. Term. füzetek, vii. pp. 21–30.

List of species, with descriptions of several new ones.

Additions to list of *Hemiptera-Heteroptera* of Dulwich ; Wood & Pim, Rep. Dulw. Soc. v. p. 46.

Fokker remarks on the following Dutch *Hemiptera* :—*Teratocoris antennatus*, Boh., *Orthotylus*, Fieb. (11 species new to the fauna), and *Cimex hirundinis*, Jen. ; Tijdschr. Ent. xxvi. pp. xviii. & xix.

Pentatomidæ.

Signoret, V. Groupe des Cydnides. 9e–10e parties. Ann. Soc. Ent. Fr. (6) iii. pp. 33–60 & 207–220, pls. ii.–v. (xvii.–xx. of Signoret's series).

Includes the genus *Geotomus*, Muls. & Rey, all the species being figured. The following synonymy is given :—*G. senegalensis*, Klug & Er. (= *rufipes*, Koll.), *glaber*, Sign. (= *hirtipes*, Beauv., *nec* Stål), *pygmæus*, Dall. (= *Cydnus raro-ciliatus*, Ellenr., *pallidicornis*, Voll., *apicalis*, Horv., *palliditarsus*, Scott, *jucundus* and *subtristis*, White, and ? *minutus*, Motsch.), *punctulatus*, Costa (= *levicollis*, Costa, *helferi*, *lacconotus*, *aciculatus*, Fieb.,

bifoveolatus, Herr.-Schäff., *episternalis*, Muls. & Rey, *lævis*, Scott, and ? *cinnamomeus*, Garbigl.), *pennsylvanicus*, Sign. (= *Melanæthus picinus*, Uhl.), *G.* (*Melanæthus*) *elongatus*, Herr.-Schäff. (= *oblongus*, Ramb.).

The following known species of Japanese *Pentatomidæ* are noticed by Distant (Tr. E. Soc. 1883, pp. 417–427) :—*Coptosoma cribrarium*, Fabr., var.; *Geotomus punctulatus*, Costa, var.; *Graphosoma lineatum*, Linn., var. *nigro-lineatum*, Rossi; *Palomena angulosa*, Motsch.; *Plautia fimbriata*, Fabr. (= *stali*, Scott); and *Urostylis striicornis*, Scott.

Waterhouse, Aid, ii. pl. cxxxv. figs. 1–5, figures *Tesseratoma hornimani*, *Neoglypsus viridicatus*, *Niarius illuminatus*, *Cephaloplatys fasciatus*, and *Tropidocoris japonicus*, of Distant.

Horváth tabulates the species of *Schirus*; and records from Brussa and describes *Schirus cypriacus*, Dohrn, *Palomena prasina*, Linn., var. *rhododactyla*, and *Dolycoris varicornis*, Jak.: Term. füzetek, vii. pp. 22–24.

Berg, An. Soc. Arg. xv. pp. 197–212, notes the following synonyms :—*Æthus insularis*, Westw. (= *Cyrtomenus laviculus*, Berg), *Pangæus mœstus*, Stål (= *Macroscytus lugubris*, Berg, *nec* Stål), *Amnestus subferrugineus*, Westw. (= *lautipennis*, Berg, *nec* Stål), *Loxa flavicollis*, Dru. (= *Cimex albicollis*, Fabr., *Pentatoma viridis*, Beauv., and *Loxa virescens*, Am. & Serv.).

Podispus spinosus, Dall., and *Perillus circumcinctus*, Say, noticed and figured; Harrington, Rep. E. Soc. Ont. 1882, p. 57, figs. 64 & 65.

Tholagmus sardous, Costa, = *flavo-lineatus*, Fabr., var.; Puton, Rev. d'Ent. ii. p. 286.

Podops, Lesp., and *Scotinophora*, Stål. Synopsis of European species (11); the former genus is divided into 3 subgenera; the plate represents the head and thorax of all the species: Horváth, Wien. ent. Z. ii. pp. 133–138 & 161–167, pl. ii.

Scotinophora sicula, Costa, var. (?) *cornuta* from Sennaar described; *id. l. c.* p. 167.

Murgantia histrionica, Hahn, discussed; Lintner, Rep. Ins. N. York, i. pp. 264–271, fig. 77.

Euschistus picticornis, Stål, redescribed; Berg, *l. c.* p. 206.

Plinocoris stali, Sahlb. (1878), = *Elasmostethus dorsalis*, Jak., and belongs to *Clinocoris*; Jakovleff, Rev. mens. Ent. i. p. 110.

New genera and species :—

Petalodera, Horváth, Wien. ent. Z. ii. p. 138. Subgenus of *Podops*. To include *P. dilatata* (Fieb.), Put., and *P. buccata*, sp. n., *l. c.* p. 138, Bousaada, Algeria.

Opocrates, id. *l. c.* p. 161. Subgenus of *Podops*. To include *P. curvidens*, Costa, and *annulicornis*, Jak.; add *O. dalmatina*, Dalmatia, p. 162, *incerta*, Astracan, p. 162, and *rectidens*, Dobrudsca, p. 163, spp. nn., *l. c.*

Storthecoris, id. *l. c.* p. 296. Allied to *Scotinophora* and *Amauropepla*, Stål. Type, *S. nigriceps*, sp. n., *l. c.* p. 297, Himalaya.

Neocazira, Distant, Tr. E. Soc. 1883, p. 420. Allied to *Cazira*;

scutellum broader, longer, and deflexed. Type, *N. confragosa*, sp. n., *ibid.* pl xix. fig. 2, Japan.

Parastrachia, Distant, *l. c.* p. 424. Intermediate between *Strachia* and *Catacanthus*. Type, *P. fulgens*, sp. n., *l. c.* p. 425, pl. xix. fig. 5, Japan.

Cyptocephala, Berg, An. Soc. Arg. xv. p. 209. Allied to *Cosmopepla*. Type, *C. cogitabunda*, sp. n., *l. c.* p. 210, Buenos Aires.

Coptosoma anatolicum, Horváth, Term. füzetek, vii. p. 21, Brussa.

Psacasta (*Cryptodontus*) *rugulosa*, id. *l. c.* p. 22, Brussa.

Dalleria plat[*y*]*aspis*, id. *l. c.* p. 23, Brussa.

Geotomus levipennis, fig. 144, Cayenne, Amazons, p. 35, *bergi* (= *americanus*, Berg, *nec* Stål), fig. 145, Missiones, p. 36, *subparallelus*, Rio Grande do Sul, p. 37, *foratus*, fig. 146, Amazons, p. 38, *obscurus*, fig. 147, Ocana, p. 39, *nigro-cinctus*, fig. 148, pl. ii., Brazil p. 40, *semilevis*, fig. 153, Mexico, p. 44, *scutello-punctatus*, fig. 156, Nossi-Bé, p. 47, *landsbergi* [*lansbergii*], fig. 157, Ardjoeno, East Java, p. 48, *jakowleffi*, fig. 158, Lenkoran, Caucasus, p. 49, *lethierrii*, fig. 159, Java, p. 50, *pusillus*, fig. 162, pl. iii., Madagascar, p. 53, *proximus*, fig. 163, Bourbon, p. 54, *antennatus*, fig. 165, Syria, p. 56, *distanti*, fig. 167, Australia, p. 58, *parvulus* (= *Melanæthus elongatus*, Uhl.), fig. 170, California, *G.* (*Melanæthus*) *crenatus*, fig. 171, pl. iv., Mexico, p. 208, *G.* (*M.*) *radialis*, fig. 173, Cape, p. 210, *G.* (*M.*) *uhleri*, fig. 174, North America, *G.* (*M.*) *scharfferi*, fig. 175, Sennaar, p. 211, *gracilipes*, fig. 177, Adelaide, p. 213, *G.* (*Melanæthus*) *breweri*, fig. 178, West Australia, p. 214, *G.* (*M.*) *striiventris*, fig. 179, Dagang, p. 215, *G.* (*M.*) *punctatissimus*, fig. 180, Sitka, *G.* (*Alonips*) *rugosulus*, fig. 181, pl. v., Old Calabar, p. 216, *G.* (*Alonips*) *abdominalis*, fig. 184, East Indies, and *G.* (?) *niger*, fig. 185, pl. ix., Tasmania, p. 219, Signoret, Ann. Soc. Ent. Fr. (6) iii.

Thyreocoris xanthocnemis, Berg, An. Soc. Arg xv. p. 200, Corrientes.

Canthophorus variegatus, Signoret, Tr. E. Soc. 1883, p. 418, Japan.

Pœcilochroma lewisi, Distant, Tr. E. Soc. 1883, p. 419, pl. xix. fig. 1, Japan.

Plociomerus similis, id. *l. c.* p. 421, Japan.

Stiretrus decacelis, Berg, *l. c.* p. 202, Buenos Aires.

Podops retowskii, Horváth, Wien. ent. Z. ii. p. 137, Crimea.

Scotinophora horvathi (= *vermiculata*, Horv., *nec* Voll.), Distant, *l. c.* p. 421, pl. xix. fig. 3, Japan.

Ænaria assimulans, id. *l. c.* p 421, pl. xix. fig. 4, Japan.

Sepontia ænea, id. *l. c.* p. 422, Japan.

Stollia lewisi, id. *l. c.* p. 423, pl. xix. fig. 6, Japan.

Alcimus borealis, id. *l. c.* p. 423, Japan.

Tholagmus breviceps, Jakovleff, Rev. mens. Ent. i. p. 14, and Bull. Mosc. lviii. (1) p. 423, Varna.

Strachia scutellata, id. *ll. cc.* pp. 14 & 424, Kulja.

Menida japonica, Distant, *l. c.* p. 425, pl. xix. fig. 7, Japan.

Mormidea spegazzinii, Berg, *l. c.* p. 204, Argentine Republic.

Poriptus filius, id. *l. c.* p. 205, Buenos Aires.

Euschistus circumfusus and *sellowii*, id. *l. c.* p. 208, Montevideo.

Thoreyella cornuta, id. *l. c.* p. 215, Uruguay.

Edessa nigro-punctata, Berg, *l. c.* p. 216, Montevideo.
Elasmostethus humeralis, Jakovleff, *ll. cc.* pp. 15 & 426, Vladivostok.
Clinocoris gramineus, Distant, *l. c.* p. 426, pl. xix. fig. 8, Japan.
Megymenum tauriformis [*-me*], id. *l. c.* p. 427, Japan.

Coreidæ.

Meropachus dorsiger, Westw., = *variolosus*, Burm.; *Chariesterus gracilis*, Lap., = *armatus*, Thunb.; *Pamera flavicosta*, Berg, = *Acroleucus coxalis*, Stål: Berg, An. Soc. Arg. xv. pp. 241–258.
Merocoris bergi, Mayr, redescribed; *id. l. c.* pp. 241 & 242.
Harmostes procerus, Berg. Larva and pseudimago noticed; *id. l. c.* p. 252.
Dasycoris hirticornis, Fabr., Burm. (= *hirsutus*, Burm.), noticed; Horváth, Term. füzetek, vii. p. 25.
Metapodius femoratus, Fabr., destructive to *Leucania unipuncta*, noticed and figured; Riley, Rep. U. S. Ent. Comm. iii. p. 125, pl. ii. fig. 3.

New genera and species:—

Astygiton, Berg, An. Soc. Arg. xv. p. 247. Allied to *Namacus*, Am. & Serv. Type, *A. guttatellus*, sp. n., *l. c.* p. 248. Argentine Republic.
Myrmecalydus, id. *l. c.* p. 250. Allied to *Cydamus*. Type, *M. celeripes*, sp. n., *l. c.* p. 251, Argentine Republic, Uruguay.
Xenogenus, id. *l. c.* p. 252. Allied to *Harmostes* and *Aufeius*. Type, *X. picturatum*, sp. n., *l. c.* p. 253, Argentine Republic, Uruguay.
Corizomorpha, Jakovleff, Bull. Mosc. lvii. (2) p. 107. Allied to *Corizus*. Type, *C. janowskii*, sp. n., *l. c.* p. 109, Kulja.
Corizus latus, id. *l. c.* p. 109, Amur, Ussuri.
Spathocera tenuicornis, id. *l. c.* p. 98, Turkistan.
Pseudophlœus intermedius, id. *l. c.* p. 101, Krasnovodsk.
Centrocarenus balassogloi, id. *l. c.* p. 103, Turkistan.
Haploprocta umbrina, id. *l. c.* p. 105, Caucasus.
Spartocera dentriventris, Berg, An. Soc. Arg. xv. p. 244, Buenos Aires.
Anasa montevidensis, id. *l. c.* p. 249, Montevideo.
Homœocerus tinctus, Distant, Ann. N. H. (5) xi. p. 170, Mergui.

Berytidæ.

Berytus cognatus, Fieb., is the macropterous form of *B. minor*, Herr.-Schäff.; Reuter, Medd. Soc. Fenn. ix. p. 137.

Lygæidæ.

Distant, Tr. E. Soc. 1883, pp. 435–440, notices the following Japanese *Lygæidæ*:—*Pamera rustica*, Scott, *pallicornis*, Dall. (= *Plociomerus discoguttatus*, Dohrn, and *Diplonotus luridens*, Scott), *Pachymerus japonicus*, Stål (= *Graptopelta albimarginata*, Scott, *nec* Uhler), *Pœantius lineatus*, Stål, and *Gastrodes japonicus*, Stål (= *ferrugineus*, Scott, *nec* Linn.).

Lygæus gibbicollis, Costa, = *punctato-guttatus*, Fabr. var.; Puton, Rev. d'Ent. ii. p. 286.

Pamera polychroma, Spin. Larva and subimago described; Berg, An. Soc. Arg. xv. pp. 263 & 264.

Proderus crassicornis, Jak., occurs in the Caucasus, Anatolia, and Corfu; Horváth, Term. füzetek, vii. p. 26.

Pterotmetus staphylinoides, Burm., recorded as new to Holland; Fokker, Tijdschr. Ent. xxvi. p. cxliii.

Trapezonotus agrestis, Fall., var. *seductor* from Brussa described; Horváth, *l. c.* p. 27.

Pachymerus consors, Horv. (= *Microtoma morio*, Reut.), noticed; *id. ibid.*

Ischnocoris hemipterus, auctt. (*nec* Schill.), and *intermedius*, Horv., = *angustulus*, Boh.; Reuter, Medd. Soc. Fenn. ix. p. 137.

Eremocoris, Fieb. Monographic revision (7 species admitted, 1 new); Horváth, *l. c.* pp. 1–12, pl. i. (details). *E. erraticus*, Fabr., though British, is distinct from that of Douglas & Scott, under which name *E. fenestratus*, Herr.-Schäff., and *podagricus*, Fabr., are confounded; Douglas, Ent. M. M. xix. pp. 266 & 267.

On destroying chinch bugs with kerosene; S. A. Forbes, Bull. Dep. Agric. Ent. ii. pp. 23–25.

Ectatops nigro-scutellatus, Signoret (*Pyrrhocoridæ*), is now referred by him to *Astacops* (*Lygæidæ*); Bull. Soc. Ent. Fr. (6) iii. p. xiii.

New genera and species:—

Idiotropus, Berg, An. Soc. Arg. xv. p. 267. Allied to *Heterogaster*. Type, *I. insularis*, sp. n., *l. c.* p. 268, Basket Island, Cape Horn. [The genus, being preoccupied, is renamed *Idiostolus*; id. *op. cit.* xvi. p. 87.]

Paradieuches, Distant, Tr. E. Soc. p. 438. Intermediate between *Dieuches* and *Neurocladus*. Type, *P. lewisi*, sp. n., *l. c.* p. 439, pl. xx. fig. 4, Yokohama.

Oncopeltus stæli (= *varicolor*, Berg, *nec* Fabr.), Berg, An. Soc. Arg. xv. p. 255, Argentine Republic.

Melanospilus elegans, Distant, Tr. E. Soc. 1883, p. 428, pl. xix. fig. 9, Japan.

Lygæus hanseni, Jakovleff, Rev. mens. Ent. i. p. 15, and Bull. Mosc. lviii. (1) p. 427, Irkutsk, &c.; *L.* (*Ochrostomus*) *trivittatus*, Berg, *l. c.* p. 257, Buenos Aires.

Aspilocoryphus viduus, Lethierry, Ann. Mus. Genov. xviii. p. 745, Shoa.

Nysius plebeius and *expressus*, Distant, *l. c.* p. 429, Japan.

Ischnorrhynchus nubilus, id. *l. c.* p. 430, Yokohama.

Cymus aurescens, id. *l. c.* p. 430, pl. xix. fig. 10, Yokohama.

Ischnodemus suturalis, Horváth, Term. füzetek, vii. p. 26, Brussa; *I. obnubilus*, Distant, *l. c.* p. 431, pl. xix. fig. 11, Yokohama; *I. signoreti*, Berg, *l. c.* p. 260, Buenos Aires.

Blissus pallipes and *bicoloripes*, pl. xix. fig. 12, Distant, *l. c.* p. 432, Japan.

Geocoris maurus, Jakovleff, *ll. cc.* pp. 15 & 429, Krasnovodsk; *G. proteus*, Distant, *l. c.* p. 432, pl. xx. figs. 1 & 2, Nagasaki, Yokohama.

Phlegyas patruelis, Berg, *l. c.* p. 261, Buenos Aires.
Rhyparochromus brevicornis, Puton, Rev. d'Ent. ii. p. 13, Syria.
Emblethis gracilicornis, id. *ibid.*, Jeddah.
Pachymerus brevis, Lethierry, *l. c.* p. 746, Shoa.
Tropidostethus dubius, Berg, *l. c.* p. 265, Buenos Aires.
Lamprodema inerme, id. *l. c.* p. 266, Buenos Aires.
Hadrocnemis rufescens, Jakovleff, Bull. Mosc. lviii. (1) p. 432, Turkistan.
Lasiocoris albo-maculatus, id. *l. c.* p. 433, Turkistan.
Pamera ejuncida, pl. xx. fig. 3, p. 433, *exigua*, *jejuna*, *erubescens*, p. 434, and *festiva*, p. 436, Distant, *l. c.*, Japan.
Plociomera japonica, id. *l. c.* p. 437, Nagasaki.
Beosus simplex, Jakovleff, Rev. mens. Ent. i. p. 16, and Bull. Mosc. lviii. (1) p. 431, Varna.
Dieuches dissimilis, Distant, *l. c.* p. 438, Hakodati.
Lethaeus lewisi, id. *l. c.* p. 440, pl. xx. fig. 7, Nagasaki; *L. syriacus*, Horváth, *l. c.* p. 27, Anatolia, Syria, Greece.
Drymus marginatus, Distant, *l. c.* p. 440, pl. xx. fig. 6, Japan.
Lamproplax membraneus, pl. xx. fig. 5, and var. *pallescens*, id. *l. c.* pp. 440 & 441, Japan.
Eremocoris fraternus and var. *longirostris*, Horváth, Rev. d'Ent. ii. pp. 7 & 8, pl. i. figs. 8 & 9 (legs), Transcaucasia.
Dermatinus æthiopicus, Lethierry, *l. c.* p. 749, Shoa.

Pyrrhocoridæ.

Distant, Biol. Centr. Am. *Rhynch. Het.* pp. 225–234, notices and figures *Stenomacra cliens*, Stål, *marginella*, Herr.-Schäff., pl. xx. fig. 22, *Arhaphe cicindeloides*, Walk., pls. xx. fig. 23, & xxi. fig. 2, *Pyrrhocoris apterus*, Linn., fig. 25 (from Costa Rica, probably introduced), *Dysdercus mimus*, Stål, fig. 4, *albidicentris*, Stål (= *lunulatus*, Uhler), figs. 5 & 10, *flavo-limbatus*, Stål, fig. 6, *concinnus*, Stål (= *mundus*, Walk.), figs. 11, 12, & 15, *obliquus*, Herr.-Schäff. (= *bimaculatus*, Stål), *ruficollis*, Linn. (= *fulvo-niger*, De Geer, and *annulus*, Fabr.), figs. 19 & 20, and *ruficeps*, Perty, fig. 23, pl. xxi.

Dysdercus suturellus, Herr.-Schäff., become destructive to orange in Florida; Hubbard, Bull. Dep. Agric. Ent. i. pp. 14–16.

Ectatops nigro-scutellatus, Signoret (*Pyrrhocoridæ*), is now referred by him to *Astacops* (*Lygæidæ*); Bull. Soc. Ent. Fr. (6) iii. p. xiii.

New species :—

Pyrrhocoris circumcinctus, Lethierry, Ann. Mus. Genov. xviii. p. 747, Shoa.

Theraneis pulchra, pl. xxii. fig. 1, Panama, and *dissimilis*, pl. xxi. fig. 24, Costa Rica, Panama, Distant, Biol. Centr. Am. *Rhynch. Het.* p. 225.

Japetus sphæroides, id. *l. c.* p. 227, pl. xxi. fig. 3, Guatemala.

Dysdercus obscuratus (? = *flavo-limbatus*, Stål, var.), figs. 8 & 7, Guatemala, *incertus*, fig. 7, Costa Rica, p. 230, *splendidus*, fig. 14, Panama, p. 231, *oncopeltus*, fig. 13, and *chiriquinus*, fig. 22, Panama, p. 232, and *capitatus*, fig. 21, Mexico, p. 233, *id. l. c.* pl. xxi.

Tingitidæ.

Galeatus maculatus, Herr.-Schäff., noticed; Fokker, Tijdschr. Ent. xxvi. p. cxliii.

Solenostoma liliputianum, Sign. (= *Coleopterodes fuscescens*, Phil.). Larva described; Berg, An. Soc. Arg. xvi. p. 85.

Monanthia (*Platychila*) *sinuaticollis*, p. 103, *M.* (*P.*) *rotundicollis*, Derbent, p. 105, and *M.* (*Monostira*) *discoidalis*, Turkistan, p. 107, Jakovleff, Bull. Mosc. lviii. (1).

Opisthochasis, g. n., Berg, An. Soc. Arg. xvi. p. 83. An aberrant form of *Tingitina*. Type, *O. albo-rostrata*, sp. n., *ibid.*, Buenos Aires.

Leptobyrsa passifloræ, sp. n., *id. l. c.* p. 85, Buenos Aires.

Phymatidæ.

Phymata erosa, Linn., noticed and figured as destructive to *Pieris rapæ*; Riley, Rep. Dep. Agric. 1883, p. 113, pl. x. fig. 5.

Aradidæ.

Aradus angusticollis, sp. n., Reuter, Medd. Soc. Fenn. vii. p. 140, Lapland [1881].

Capsidæ.

Distant, Biol. Centr. Am. *Rhynch. Het.* pp. 235-252, figures or specially notices *Miris affinis*, Reut. (= *instabilis*, Uhl.), *Valdasus famularis*, Stål, pl. xxiv. fig. 7, *Monalonion annulipes*, Sign., pl. xxiii. fig. 25, *Resthenia plagigera*, Stål, pl. xxiv. fig. 18, *picticollis*, Stål., pl. xxii. fig. 3, *pullata*, Burm. (= *candens*, pl. xxii. fig. 2), *luteigera*, Stål, pl. xxiv. fig. 19, *melanochra*, Herr.-Schäff., fig. 4, *ornaticollis*, Stål, pl. v., *latipennis*, Stål, figs. 6 & 7, pl. xxii., *hægbergi*, Stål, pl. xxiv. fig. 20, *bivittis*, Stål, fig. 21, *vitticeps*, Stål, fig. 22, *vittifrons*, Stål, fig. 23, pl. xxiv., *divisa*, Herr.-Schäff. (= *tetrastigma*, Herr.-Schäff.), *Lopidea scitula*, Walk., pl. xxiii. fig. 23, *Hadronema militare*, Uhl., pl. xxii. fig. 23, and *Compsocerocoris annulicornis*, Reut.

Phytocoris nigro-vittatus, Costa, = *Calocoris sexpunctatus*, Fabr.; *Capsus saxicola*, Costa, = *Plagiorrhamma suturalis*, Herr.-Schäff.; and *Halticus albo-notatus*, Costa, = *Orthocephalus nitidus*, Mey. Puton, Rev. d'Ent. ii. p. 287.

Calocoris reuteri, Horv., var. β from Brussa described; Horváth, Term. füzetek, vii. p. 29.

Deraeocoris trifasciatus, Linn., varr. *imitator*, Horv., and *ultramontanus*, Gredl., described from Brussa; *id. l. c.* p. 30.

Pœcilocapsus lineatus, Fabr. Habits, life-history, &c.; Lintner, Rep. Ins. N. York. i. pp. 271–281, fig. 78.

Stethoconus mamillosus, Flor., mimics *Tingis pyri*, and probably preys upon it; Rey, Ann. Soc. L. Lyon, xxix. pp. 385 & 386.

Diplacus albo-ornatus, Stål. The following are synonyms:—*Myrmecoris bimaculatus*, Motsch., *Myrmecophyes oschanini*, Fieb., and *tricondyloides*, Osch.; Jakovleff, Rev. mens. Ent. i. p. 111.

Globiceps salicicola, Reut., is not British; *G. flavo-maculatus*, Fabr., Fall., Sahlb., Saund., = *selectus*, Fieb., D. & S.; *cruciatus*, Reut., = *flavo-maculatus*, Fieb., D. & S., Reut., olim, = *fulvipes*, Saund.: Saunders, Ent. M. M. xix. p. 189.

Teratocoris hyperboreus, Sahlb., = *viridis*, Dougl. & Scott; Reuter, Medd. Soc. Fenn. ix. p. 136.

Dicyphus, Fieb. European species noticed; *id. l. c.* pp. 148 & 149. The following species allied to *D. pallidus*, Herr.-Schäff., are discussed and fully described:—*D. pallidus*, Herr.-Schäff., *constrictus*, Boh., *errans*, Wolff, *hyalinipennis*, Klug, and *pallidicornis*, Fieb.; *id.* Ent. M. M. xx. pp. 49–53.

Eccritotarsia (Reut., M.S.), Berg, An. Soc. Arg. xvi. p. 24. New section of *Capsidæ*. Type, *Eccritotarsus*, Stål.

Pilopheroria, Reut. (= *Cyllocoraria*, pt., Reut., olim), *op. cit.* p. 27. New section of *Capsidæ* (not characterized). To include *Mimocoris*, Scott, *Sericophanes* and *Myrmecomimus*, Reut., and 2 new genera.

New genera and species:—

Creontiades, Distant, Biol. Centr. Am. *Rhynch. Het.* p. 237. Belongs to the *Myraria*, but with a superficial resemblance to the *Phytocaria*. Type, *Megacœlum rubrinerve*, Stål (figured, pl. xxiii. fig. 12).

Minytus, id. *ibid.* Placed after *Creontiades*. Types, *M. argillaceus*, pl. xxiv. fig. 1, Guatemala, and *amplificatus*, Panama, spp. nn., *l. c.* p. 238.

Xenetus, id. *l. c.* p. 239. Placed after *Trachelomiris*. To include *X. lanuginosus*, fig. 3, Guatemala, *ambiguus*, Panama, p. 239, *bracteatus*, fig. 4, pl. xxiv., and *chryselectrus*, Guatemala, p. 240, spp. nn.

Zacorus, id. *l. c.* p. 240. Allied to *Herdonius*, but antennæ shorter than the body, and scutellum spined on disk and not at apex. Types, *Z. staphyliniformis*, pl. xxiv. fig. 5, Guatemala, p. 240, and *curvicornis*, Panama, p. 241, spp. nn.

Zosippus, id. *l. c.* p. 241. Allied to *Zacorus*, but pronotum constricted nearer the anterior margin, and both lobes semiglobose. Type, *Z. inhonestus*, sp. n., *ibid.* pl. xxiv. fig. 6, Panama.

Lygdus, id. *l. c.* p. 242. General appearance and colour of the *Lygæidæ* rather than of the *Capsidæ*. Type, *L. simulans*, sp. n., *ibid.* pl. xxiv. fig. 16, Panama.

Piasus, id. *ibid.* Placed before *Valdasus*. Type, *P. illuminatus*, sp. n., *ibid.* pl. xxiv. fig. 17, Panama.

Vannius, id. *l. c.* p. 245. Allied to *Valdasus*. Type, *V. rubro-vittatus*, sp. n., *l. c.* p. 246, pl. xxiv. fig. 11, Guatemala, Panama.

Orasus, id. *l. c.* p. 248. Placed after *Monalonion*. Type, *O. robustus*, sp. n., *ibid.* pl. xxiii. fig. 13, Mexico.

Sysinas, id. *ibid.* Placed after *Orasus*. To include *S. linearis*, pl. xxiii. fig. 21, Mexico, p. 248, *audens*, fig. 25, *clarus*, *floridulus*, fig. 24, pl. xxiv., Panama, and *centralis*, pl. xxv. fig. 7, Guatemala, p. 249, spp. nn.

Zopyrus, Distant, *l. c.* p. 249. Placed after *Sysinas*. Types, *Z. rubromaculatus*, Guatemala, and *luteo-fasciatus*, Costa Rica, spp. nn., *l. c.* p. 250, pl. xxv. figs. 8 & 9.

Admetus, id. *l. c.* p. 250. Allied to *Zopyrus*. Type, *A. fimbriatus*, sp. n., *ibid.* pl. xxv. fig. 10, Panama.

Ofellus, id. *ibid.* Placed after *Admetus*. Type, *O. præstans*, sp. n., *l. c.* p. 251, pl. xxv. fig. 11, Guatemala.

Tædia, id. *l. c.* p. 262. Allied to *Compsocerocoris*. Type, *T. bimaculata*, sp. n., *ibid.* pl. xxv. fig. 16, Panama.

Paracalocoris, id. *l. c.* p. 263. Placed after *Neurocolpus*. To include *Calocoris jurgiosus*, Stål (figured, pl. xxv. fig. 17), and *attenuatus*, Guatemala, *fistulosus*, pl. xxii. fig. 11, and *annulatus*, Panama, spp. nn., *l. c.* p. 264.

Ophthalmomiris, Reuter & Berg, An. Soc. Arg. xvi. p. 6. Allied to *Miris* and *Leptosterna*. Type, *O. reuteri*, Berg, sp. n., *l. c.* p. 7, Argentine Republic, Uruguay.

Porpomiris, Berg, An. Soc. Arg. xvi. p. 8. Allied to *Miris* and *Pantilius*. Type, *P. picturatus*, sp. n., *ibid.* (larva also described), Buenos Aires.

Derophthalma, id. *l. c.* p. 22. Allied to *Stethoconus*. Type, *D. reuteri*, sp. n., *l. c.* p. 23, Argentine Republic, Uruguay.

Myrmecopeplus, id. *l. c.* p. 27. Allied to *Sericophanes* and *Mimocoris*. Type, *Monalonion ornatum*, Berg.

Myrmecozelotes, id. *l. c.* p. 30. Allied to *Myrmecomimus*, Reut. Type, *M. lynchi*, sp. n., *l. c.* p. 31, Buenos Aires.

Spanagonicus, id. *l. c.* p. 78. Allied to *Agalliastes*. Type, *S. provincialis*, sp. n., *l. c.* p. 79, Buenos Aires.

Microtechnites, id. *l. c.* p. 73. Allied to *Cyrtorrhinus*. Type, *Capsus* (*Deræocoris*) *pygmæus*, Berg.

Miris guatemalanus, Guatemala, and *roseus*, pl. xxiii. fig. 20, Mexico, Distant, Biol. Centr. Am. *Rhynch. Het.* p. 236.

Trachelomiris oleosus, id. *l. c.* p. 238, pl. xxiv. fig. 2, Guatemala, Panama.

Phytocoris bonaerensis, Berg, An. Soc. Arg. xvi. p. 11, Buenos Aires.

Calocoris tucumanus, id. *l. c.* p. 15, Tucuman.

Lygus fatuus, Lethierry, Ann. Mus. Genov. xviii. p. 749, Shoa; *L. cetratus*, Berg, *l. c.* p. 17, Uruguay.

Pœciloscytus eryngii, id. *l. c.* p. 19 (larva also described), Buenos Aires.

Pœcilocapsus nubilellus, id. *l. c.* p. 21, Buenos Aires.

Lopus vittiventris, Puton, Rev. d'Ent. ii. p. 14, Algeria.

Eccritotarsus erythronotus, Uruguay, p. 24, *platensis*, p. 25, and *holmbergii*, Buenos Aires, p. 26, Berg, *l. c.*

Mimocoris scotti, id. *l. c.* p. 28, Buenos Aires (larva also described).

Halticus spegazzinii, id. *l. c.* p. 75, Buenos Aires.

Conostethus (?) *pamparum*, id. *l. c.* p. 76, Buenos Aires.

Agalliastes argentinus, id. *l. c.* p. 77, Buenos Aires.

Atractotomus morio, Sahlberg, Medd. Soc. Fenn. ix. pp. 94 & 154, Finland; *A. egregius*, Berg, *l. c.* p. 79, Buenos Aires (larva also described).

Campylomma nicolasi, Puton, *l. c.* p. 251, Avignon.

Platycranus metriorrhynchus, Reuter, Rev. d'Ent. ii. p. 252, France.

Orthotylus cupressi, id. *l. c.* p. 253, Avignon.

Valdasus stellatus, Guatemala, *marginicollis*, p. 243, *funebris*, fig. 8, *erebeus*, *cerbereus*, p. 244, *stygius*, fig. 9, Panama, Bugaba, and *rugosus*, fig. 10, Guatemala, p. 245, Distant, *l. c.* pl. xxiv.

Monalonion versicolor, fig. 12, *hilaratum*, fig. 13, Guatemala, *atratum*, fig. 14, Panama, and *dissimulatum*, fig. 15, Guatemala, *id. l. c.* p. 247, pl. xxiv.

Resthenia montana, fig. 1, p. 252, *panamensis*, fig. 6, Panama, *univittata*, fig. 2, Guatemala, *chiriquina*, fig. 3, p. 253, *bracteata*, *obscurans*, fig. 4, *erubescens*, Panama, *atrata*, Guatemala, p. 254, *mimica*, Panama, *guatemalana*, fig. 5, pl. xxv., Guatemala, *plena*, Mexico, p. 255, *montivaga*, Panama, *sudatus* [*-ta*], fig. 17, Mexico, *bicolor*, Guatemala, p. 256, *persignanda*, fig. 21, *exornata*, fig. 20, *thoracica*, fig. 14, *interpuncta*, fig. 15, p. 257, *marginanda*, fig. 16, and *parva*, fig. 18, pl. xxii., Mexico, p. 258, *id.* l. c.; *R. uruguayensis*, Uruguay, and *montevidensis*, Montevideo, Berg, *l. c.* pp. 92 & 93.

Lopidea bellula, Distant, *l. c.* p. 259, Guatemala.

Compsocerocoris exustus, *dubitatus*, fig. 12, Guatemala, *vilis*, fig. 13, Guatemala, Panama, p. 260, *elegans*, fig. 14, p. 261, and *mistus*, fig. 15, Guatemala, p. 262, *id. l. c.* pl. xxv.

Neurocolpus mexicanus, pl. xxiii. fig. 5, and *affinis*, Guatemala, Panama, *id. l. c.* pp. 262 & 263.

Dicyphus epilobii (= *pallidus*, Dougl. & Scott, *nec* Herr.-Schäff.), England, and *stachydis*, Europe, Siberia, Reuter, Ent. M. M. xx. pp. 52 & 53.

Pycnopterna suturalis, Jakovleff, Rev. mens. Ent. i. p. 110, Caucasus.

Anthocoridæ.

Anthocoris, Fall. European species discusssed; Reuter, Medd. Soc. Fenn. ix. pp. 78–81, 139, & 140.

Pachycoleus rufescens, Sahlb., recorded from Eberswald; *id. l. c.* p. 136.

Piezostethus sphagnicola, Abo, and *thomsoni*, Öland, spp. nn., *id.* Ent. Tidskr. iv. pp. 135 & 137.

Cimicidæ.

Cimex lectularius, Linn. An arrangement of fly-paper found useful to prevent its attacks; Hilgendorf, B. E. Z. xxvii. pp. 301–303.

Saldidæ.

Salda lapponica, Sahlb., is the micropterous form of *S. saltatoria*, Linn.; Reuter, Medd. Soc. Fenn. ix. p. 137.

Salda grenieri, sp. n., Signoret, Bull. Soc. Ent. Fr. (6) iii. p. xlii., Tunis (= *lateralis*, Fall., var. *concolor*, Put.; Puton, Rev. d'Ent. ii. p. 287).

Nabidæ.

Pagasa nitida, Stål. Variation noticed; Berg, An. Soc. Arg. xvi. pp. 106 & 107.

Coriscus tandilensis, sp. n., *id. l. c.* p. 107, Buenos Aires.

Reduviidæ.

Harpactor cinctus, Fabr., noticed and figured; Harrington, Rep. E. Soc. Ont. 1882, p. 67, fig. 66.

Ectrychotes atripennis, Stål, var. (?) from Mergui noticed; Distant, Ann. N. H. (5) xi. p. 170.

Hæmatolæcha nigro-rufa, Stål, figured; *id.* Tr. E. Soc. 1883, pl. xx. fig. 10.

Spiniger (*Acrocoris*) *femoralis* and *fraternus*, Stål, are sexes; *S.* (*Pantopsilus*) *longipes*, Berg, ♀ described: Berg, An. Soc. Arg. xvi. p. 112.

Pasira dimidiata, Fieb. (= *basiptera*, Stål). Brachypterous form described; Horváth, Term. füzetek, vii. p. 29.

Emesa longipes, De Geer, noticed; Provancher, Nat. Canad. xiv. pp. 73 & 74.

New species:—

Cosmoclopius intermedius, Berg, An. Soc. Arg. xvi. p. 108, Montevideo.

Harpactor lineaticollis, Lethierry, Ann. Mus. Genov. xviii. p. 751, Shoa.

Coranus pectoralis, Jakovleff, Bull. Mosc. lviii. (1) p. 435, Turkistan; *C. paradoxus* and *metallicus*, Lethierry, *l. c.* pp. 752 & 753, Shoa.

Heniartes mayri (= *flavicans*, Berg, *nec* Fabr.), Berg, *l. c.* p. 109, Argentine Republic.

Ectrychotes comottoi, Lethierry, Ann. Mus. Genov. xviii. p. 648, Burma; *E. delibutus*, Distant, Tr. E. Soc. 1883, p. 441, pl. xx. fig. 12, Japan.

Labidocoris splendens and *insignis*, id. *l. c.* p. 442, pl. xx. figs. 8 & 9, Japan.

Hæmatolæcha rubescens, id. *ibid.* pl. xx. fig. 11, Nagasaki.

Diaditus annulipes, Berg, *l. c.* p. 112, Buenos Aires.

Bactrodes multiannulatus, id. *l. c.* p. 114, Buenos Aires.

Deliastes brachmanni, id. *l. c.* p. 115, Mendoza.

Prostemma flavo-maculatum, Lethierry, *l. c.* p. 649, Burma.

Henicocephalidæ.

Henicocephalus subantarcticus, sp. n., Berg, An. Soc. Arg. xvi. p. 116, Staten Island (Fuegia).

Hebridæ.

Lipogomphus, Berg, differentiated from *Hebrus*, Curt.; Berg, An. Soc. Arg. xvi. p. 148.

Hydrometridæ.

White, F. B. Report on the Pelagic *Hemiptera* procured during the Voyage of H.M.S. 'Challenger,' in the years 1873–76. Rep. Voy. 'Challenger,' Zool. vii. pt. 19, pp. 82, pls. iii. (*Cf.* Ent. M. M. xx. pp. 119 & 123.)

The sections into which this exhaustive treatise is divided are History and Bibliography, including copies of nearly all important previous notices on *Halobates*, anatomy and description of genera and species (all the known species, as far as possible, being fully described and figured), life-history (including metamorphoses) and habits, geographical distribution, appendix, and index. 2 new genera of the family (1 only marine) and several new species of *Halobates* are described. The two pelagic genera are distinguished as follows:—1. Body thickly clothed with short pubescence; front tibia with a triangular dilatation near the apex; middle tibia and first joint of tarsus with a long fringe; hind tarsus with one joint: *Halobates*. 2. Body more sparsely clothed with short pubescence; front tibia cleft, but not with a triangular dilatation at the apex; middle tibia and tarsus without a long fringe; hind tarsus with two joints: *Halobatodes*.

Halobates platensis, Berg. ♂ described by him; An. Soc. Arg. xvi. p. 120.

New genera and species:—

Platygerris, F. B. White, Ent. M. M. xx. p. 36. Distantly related to *Hydrobates* and *Halobates*. Type, *P. depressa*, sp. n., *ibid.*, Mexico.

Halobatodes, id. Rep. Pel. *Hemipt.* pp. 23 & 58. Type, *Halobates lituratus*, Stål; add *H. histrio*, Japan, and *compar*, India, spp. nn., *l. c.* pp. 66 & 68, pl. ii. figs. 5 & 6, and ? *H. stali*, Dohrn.

Stephania, id. *l. c.* p. 79. Allied to *Halobates*; mesonotum with a narrow free process (scutellar) posteriorly overlapping the base of the abdomen. Type, *H. pictus*, Germ. (a freshwater N. American species); *H. platensis*, Berg, probably also belongs to this genus.

Velia platensis, Berg, An. Soc. Arg. xvi. p. 119, Argentine Republic, Uruguay.

Halobates princeps, fig. 3, Celebes Sea, p. 44, *sobrinus*, fig. 5, Tahiti, p. 46, *germanus*, fig. 6, N. Pacific Ocean, Celebes Sea, China Sea, p. 50, *hayanus*, fig. 8, pl. i., Red Sea, near Aden, p. 52, *proavus*, fig. 1, Gilolo, p. 54, and *frauenfeldanus* (=*flaviventris*, Frauenf., *nec* Esch.), fig. 3, pl. ii., Indian Ocean, near Nicobars, White, Rep. Pel. *Hemipt.*

Belostomatidæ.

Belostoma overcoming a fish three or four times its own length; Todd, Am. Nat. xvii. pp. 548 & 549.

Phthanocoris occidentalis, g. & sp. nn., indicated as a Carboniferous

form from Missouri, allied to *Zaitha*; Scudder, P. Bost. Soc. xxii. pp. 58 & 59.

Zaitha mayri, sp. n., Berg, An. Soc. Arg. xvi. p. 121, Buenos Aires.

Nepidæ.

Laccocoris nymphearum, sp. n., Rochebrune, Mem. Soc. Philom. (7) vii. p. 177, Senegambia.

Notonectidæ.

Signoretiella, g. n., Berg, An. Soc. Arg. xvi. p. 122. Allied to *Antipalocoris*, Scott. Type, *S. uruguayensis*, sp. n., *l. c.* p. 124, Uruguay.

HEMIPTERA-HOMOPTERA.

Distant, W. L. Biologia Centrali-Americana [*cf.* Godman, F. Ducane, & Salvin, O., *Insecta*, General Subject]. *Rhynchota Homoptera*, pp. 17–24, pl. iii.

Extends from *Fidicina* to *Phrictus*.

Ferrari, P. M. Cicadaria agri Ligustici hucusque lecta P. M. Ferrari enumerat. Ann. Mus. Genov. xviii. pp. 75–165, woodcuts.

Includes a synonymic catalogue with very full references, and notes on localities, &c, synoptic tables of families, genera, species, and, in some cases, even of varieties, and descriptions of several new and little-known species; the figures represent the genital segments of different species of *Iassus*.

Fletcher, J. *Homoptera*: The Harvest Flies and their allies. Rep. E. Soc. Ont. 1882, pp. 69–83, figs. 83-91.

An introductory article, illustrated by notices and figures of representative Canadian species.

Neuration of *Homoptera*; notation discussed: J. Edwards, Ent. M. M. xx. p. 114.

List of *Homoptera* collected in Provence; Lethierry, Rev. d'Ent. ii. p. 43.

Cicadidæ.

Mayr, M. Tabellen zum Bestimmen der Familien und Gattungen der Cicadinen von Centraleuropa, nebst Angabe der aus diesem Gebiete bekannten Arten. (Separatabdrück aus den Programme das k. k. Gymnasiums zu Hall in Tirol für das Schuljahr 1882–83.) (*Cf.* Wien. ent. Z. ii. p. 281.)

Distant, Biol. Centr. Am. *Rhych. Hom.* pp. 17–21, specially notices and figures *Fidicina spinicosta*, Walk. (= *lacrines*, Walk.), pl. ii. figs. 15 & 15*a*, *b*, *semilata*, Walk. (= *passer*, *brizæ*, *melisa*, *melinæ*, *panyasæ*, *pidytes*, *physcoa*, *braure*, and *solemnis*, Walk.), pl. iii. figs. 7 & 7*a*, *b*, *Calyria occidentis*, Walk. (= *virginea*, Stål), pl. ii. figs. 17 & 17*a*, *b*, *cuna*, Walk.

(= *blanda*, Stål), pl. iii. figs. 4 & 4*a*, *b*, *Carineta trivittata*, Walk., figs. 13 & 13*a*, *indecora*, Walk., figs. 18 & 18*a*, *b*, *marginella*, Walk. (= *ancilla*, Stål), figs. 16 & 16*a*, *b*, and *lugubrina*, Stål, figs. 19 & 19*a*, *b*, pl. ii.

Berg, An. Soc. Arg. xvi. pp. 180–185, notices various *Cicadidæ*, including *Fidicina semilata*, Walk. (variation), *Tympanoterpes gigas*, Oliv. (= *Cicada tri-hypsilon*, *sonans*, *consonans*, and *vibrans*, Walk., *T. grossa*, pt., Stål, and *T. sibilatrix*, Berg), *T. serricosta*, Germ. (= *Fidicina pusilla*, Berg), and *Carineta fasciculata*, Germ. (= *Cicada obtusa*, Walk., and *Carineta diplographa*, Berg).

Zammara columbia, *Pœcilopsaltria leopardina*, and *Platypleura inquinata*, Dist., figured; Waterhouse, Aid. ii. pl. cxxviii. figs. 1–3.

Cosmopsaltria abdulla, Dist., = *spinosa*, Fabr.; *Carineta diplographa*, Berg, = *obtusa*, Walk., = ? *fasciculata*, Germ.: Distant, P. Z. S. 1883, p. 193.

Phœnax reticulata, Spin., = *variegata*, Oliv.; *Delphax maculipes*, Berg, is a *Stenocranus*; *Ormenis cestri*, Berg, larva and pseudimago noticed: Berg, An. Soc. Arg. xvi. pp. 185, 236, & 239.

Platypleura strumosa, Fabr., is distinct from *contracta*, Walk., but = *afzeli*, Stål, and *ærea*, Dist.; Distant, Ann. N. H. (5) xi. pp. 172 & 173, pl. ii. fig. *c*.

Tibicen (?) *lifuana*, Montr., redescribed; *id.* P. Z. S. 1883, p. 190.

Cicada septemdecim, Linn., noticed; Forshay, Bull. Dep. Agric. Ent. ii. pp. 31 & 32, and Bessey, Am. Nat. xvii. pp. 1070 & 1071. Immense numbers congregrating round the roots of a single tree left standing in a clearing; Claypole, Am. Nat. xvii. pp. 320–322.

Perissoneura, g. n., Distant, P. Z. S. 1883, p. 189. Placed after *Cosmopsaltria*. Type, *P. maculosa*, sp. n., *l. c.* p. 190, pl. xxv. figs. 3 & 3*a*, *b*, Celebes.

New species:—

Zammara luculenta, Distant, P. Z. S. 1883, p. 187, pl. xxv. figs. 4 & 4*a*, *b*.

Tettigarcta crinita, id. *l. c.* p. 188, pl. xxv. figs. 5 & 5*a*-*c*, Australia.

Platypleura rutherfordi, id. Ann. N. H. (5) xi. p. 173, pl. ii. fig. D, Calabar, Isubu.

Dundubia rafflesi, id. P. Z. S. 1883, p. 188, Java.

Cosmopsaltria meyeri, id. *l. c.* p. 189, pl. xxv. figs. 2 & 2*a*, *b*, Celebes; *C. andersoni*, id. Ann. N. H. (5) xi. p. 170, Mergui.

Fidicina fumea, id. Biol. Cent. Am. *Rhynch. Hom.* p. 17, pl. iv. figs. 4 & 4*a*, *b*, Panama.

Tibicen guatemalenus, id. *l. c.* p. 18, pl. ii. figs. 8 & 8*a*, *b*, Guatemala.

Melampsalta oldfieldi, id. P. Z. S. 1883, p. 191, New Holland.

Carineta crocea, pl. xxv. figs. 1 & 1*a*, *b*, Colombia, p. 191, *cingenda*, Madeira River, Amazons, *apicalis*, Ega, p. 192, *rubricata*, locality unknown, p. 193, *id.* l. c.; *C. viridicata*, figs. 1 & 1*a*, *b*, Panama, p. 19, *astiva*, figs. 3 & 3*a*, *b*, *verna*, figs. 2 & 2*a*, *b*, pl. iv., and *cinara*, pl. iii. figs. 11 & 11*a*, *b*, Panama, p. 20, *id.* Biol. Centr. Am. *Rhynch. Hom.*

Tibicina lacteipennis, Puton, Rev. d'Ent. ii. p. 45, N. Persia.

Cicadetta aurantiaca, id. *ibid.*, Algeria.

CERCOPIDÆ.

Tomaspis terrea, Germ. (= *argentina*, Berg), and *tristis*, Fabr. (variation; *T. integra*, Walk., is probably a variety), noticed; Berg, An. Soc. Arg. xvi. pp. 239 & 240.

Tomaspis platensis, sp. n., *id. l. c.* p. 240, Argentine Republic and Uruguay.

Locris hieroglyphica, sp. n., Lethierry, Ann. Mus. Genov. xviii. p. 755, Shoa.

FULGORIDÆ.

Fulgoridæ. Habits: they are very sluggish, are not luminous, and do not stridulate; larvæ frequently feed on the white cottony secretion so abundant about some of the smaller species: Champion, P. E. Soc. 1883, pp. xx. & xxi.

Distant, Biol. Centr. Am. *Rhynch. Hom.* pp. 23 & 24, notices and figures *Laternaria servillii*, Spin., pl. v. figs. 1 & 1*a*, *b*, and *Phrictus diadema*, Linn. (= *armata*, Dru.), var., pl. iv. figs. 5 & 5*a*, *b*.

Meiosoma griseum and *bicolor*, Costa, are sexes of *Caloscelis bonellii*, Latr.; *Aodus laplacha irrorata*, Costa, = *seticulosa*, Leth. & Fieb.: Puton, Rev. d'Ent. ii. p. 287.

Flata pallida, Herr.-Schäff., = *Cicada leporina*, Linn.; and *C. leporina*, Panz., renamed *Ollarus panzeri*: Löw, Wien. ent. Z. ii. pp. 147 & 148.

Issus frontalis, Fieb., = *musciformis*, Schrank; *id. l. c.* p. 148.

New genera and species :—

Plagiopsis, Berg, An. Soc. Arg. xvi. p. 189. Allied to *Ommatidiotus*. Type, *P. distanti*, sp. n., *l. c.* p. 191, Buenos Aires.

Idiosystatus, id. *l. c.* p. 231. Intermediate between *Bergia* and *Idiosemus*. Type, *Delphax acutiuscula*, Spin. (?); redescribed, *ibid.*

Idiosemus, id. *l. c.* p. 233. Allied to *Tropidocephala*. Type, *Liburnia xiphias*, Berg.

Phrictus quinque-partitus, Distant, Biol. Centr. Am. *Rhynch. Hom.* p. 24, pl. iv. figs. 8 & 8*a*, *b*, Panama, Colombia.

Pyrops javanensis and *mustelinus*, id. Ann. N. H. (5) xii. pp. 242 & 243, Java.

Phromnia rubicunda, id. *op. cit.* xi. p. 171, Mergui.

Dictyophara polyneura, Berg, An. Soc. Arg. xvi. p. 186, Argentine Republic, Uruguay.

Oliarius transitorius, id. *l. c.* p. 187, Uruguay.

Cixius parinarii, Rochebrune, Bull. Soc. Philom. (7) vii. p. 177, Senegambia.

Cixiosoma bonaerense, Berg, *l. c.* p. 188, Buenos Aires.

Megamelus scutellaris, Berg, *l. c.* p. 235, Corrientes.
Evides fucata, id. *l. c.* p. 236, Buenos Aires.
Falcidius lyra (Burm., MS.), *id. l. c.* p. 238, Entre Rios.

Membracidæ.

Berg notices *Darnis* (*Stictoplecta*) *limbata*, Burm. (larva described), *Argante incumbens*, Germ. (variation), and *Enchenopa monoceros*, Germ.; An. Soc. Arg. xvi. pp. 288, 289, 292, & 294.

Enchenopa binotata, Say, discussed; Lintner, Rep. Ins. N. York, i. pp. 281–288, figs. 79–84.

Entilia sinuata, Fabr., feeding on thistle, and connected with ants; [Mrs.] Treat, Bull. Dep. Agric. Ent. ii. p. 29.

New species :—

Cyphonia suturalis, Berg, An. Soc. Arg. xvi. p. 285, Tucuman.
Ceresa uruguayensis and *pauperata*, id. *l. c.* pp. 286 & 287, Uruguay.
Melusina rugifrons, id. *l. c.* p. 289, Buenos Aires.
Darnis (*Stictopelta*) *luisæ*, id. *l. c.* p. 289, Cordoba (larva also described).
Pyranthe acaciæ, id. *l. c.* p. 290, Uruguay (larva also described).
Smiliorrhachis proxima, id. *l. c.* p. 292, Uruguay.

Iassidæ.

Revision and tabulation of the British genera of *Iassidæ*; J. Edwards, Ent. M. M. xx. pp. 148–150.

Iassus abbreviatus, Leth., *atomarius*, Germ. (= *nervosus*, Fall., and *heydeni*, Kirschb., *mayri*, Kirschb., *furcatus* and *modestus*, Fieb., *mixtus*, Fabr. (= *reticulatus*, Fall.; 4 varr. described), and *provincialis* (Fieb.), Put., redescribed; Ferrari, Ann. Mus. Genov. xviii. pp. 133–139, figs.

Gypona unicolor, Stål, var. *nigro-dorsalis*, and *G. liturata*, *germari*, Stål, *pulchra*, Spängb., *adspersa* and *dohrni*, Stål, noticed; Spångberg, Ent. Tidskr. iv. pp. 102–106.

Idiocerus. British species revised, and raised to 15; *I. lituratus*, *heydeni*, and *confusus*, noticed in a former paper, respectively = *adustus*, Herr.-Schäff., ♀, *pœcilus*, Herr.-Schäff., and *albicans*, Kirschb.: J. Edwards, *l. c.* pp. 113–115. *I. tibialis*, Fieb. (= *affinis*, Fieb., *heydeni*, *vittifrons* and *rotundifrons*, Kirschb.), and *Athysanus erythrostictus* (Fieb.), Leth. (= *Allygus exemtus*, Fieb.), discussed; Löw, Wien. ent. Z. ii. pp. 15–17. *I. adustus*, Herr.-Schäff., noticed as new to Finland; Sahlberg, Medd. Soc. Fenn. ix. p. 150.

Acocephalus sp. Immature specimen described; Ferrari, *l. c.* p. 114.

Platymetopius argostagum, Amyot (= *guttatus*, Fieb.). Occurrence at Metz noticed; Bellevoye, Bull. Soc. Metz (2) xv. [1878] p. 130, note.

Deltocephalus picturatus, Fieb., is distinct from *flori*, Fieb.; *Typhlocyba* (*Anomia*) *nitidula*, Fabr., = *norgueti*, Leth.; *T.* (*A.*) *candidula*, Kirschb., = *lactea*, Leth., but is distinct from *Zygina nivea*, Muls. & Rey: Löw, *l. c.* pp. 37–39.

Eupteryx atro-punctata, Goeze (= *nigro-punctata*, Schrank, *carpini*, Fourcr., *melanostricta*, *tripunctata*, Geml., *picta*, Fabr., *aureola*, Boh., *nec* Fall.), noticed; Löw, *l. c.* pp. 148 & 149.

Zygina flammigera, Fourcr. (= *blandula*, Rossi, *quercus*, Herr.-Schäff., *nec* Linn., *gracilis*, Sc[illegible]enb.), noticed; *id. l. c.* pp. 149 & 150.

Typhlocyba pandellii, Leth., redescribed, and *T. ulmi*, Linn., var. *thecla* from Genoa described; Ferrari, *l. c.* p. 155.

Glyptocephalus, g. n., Edwards, Ent. M. M. xx. p. 148. Allied to *Doratura*, Sahlb.; vertex with one transverse impression, parallel with the anterior margin throughout. Type, *Athysanus canescens*, Dougl. & Scott.

New species:—

Gypona insignis, Brazil, p. 101, *obesa*, Mexico, p. 102, *approximata*, Brazil (?), *fallax*, locality unknown, p. 103, *ruficauda*, Mexico, p. 104, *gracilis*, Rio Janeiro, p. 105, *modesta*, Illinois, *megalops*, Brazil, Paraguay, p. 107, *rogenhoferi*, Rio Janeiro, *fraudulenta*, Mexico, p. 108, and *placida*, Brazil (?), p. 109, Spångberg, Ent. Tidskr. iv.

Allygus abbreviatus, Lethierry, Bull. Soc. Metz (2) xv. [1878] p. 128, France, &c.

Gnathodus frontalis (Fieb., Cat.), Ferrari, Ann. Mus. Genov. xviii. p. 117, Genoa.

Cicadula erythrocephala, id. *l. c.* p. 118, Genoa; *C. warioni* (Bellevoye, MS.), Lethierry, *l. c.* p. 117, Tourbières de Vittoncourt.

Thamnotettix fieberi (= *frontalis*, Fieb., MS., *nec* Herr.-Schäff.), Stazzano, and *fusco-venosa* (Mink, MS.), Genoa, Ferrari, *l. c.* pp. 123 & 124; *T. martini*, Lethierry, Rev. d'Ent. ii. p. 43, Portugal, S. France.

Iassus furcatus and *modestus* (Fieb. Cat.), Ferrari, *l. c.* pp. 136 & 137, Stazzano, &c.

Deltocephalus mellæ, Ferrari, *l. c.* p. 144, Vercelli and Legnano.

Eupteryx andalusiaca (Fieb. Cat.), *id. l. c.* p. 152, Italy, Spain.

Zygina tithide and *rhamni* (Fieb. Cat.), *id. l. c.* pp. 159 & 160, Stazzano.

PSYLLIDÆ.

Trioza cirsii, Löw, and *Pediopsis tiliæ*, Germ., recorded as new to Finland; Reuter, Medd. Soc. Fenn. ix. p. 123.

Aphalara subpunctata, Först. (= *pallida*, Leth.), noticed; Scott, Ent. M. M. xix. pp. 189 & 190.

Psylla pyricola, Först.: transformations described; *id. l. c.* pp. 205 & 206. *P. nigrita*, Zett., and *palmeni*, Löw, noticed; Reuter, *l. c.* p. 149. *P. celtidis-mamma*, Riley, noticed; Fletcher, Canad. Ent. xv. p. 40: it may be the same as *venusta*, Ost.-Sack.; Fyles & Hagen, Canad. Ent. xv. pp. 84 & 198–200.

Trioza cerastii, Loew, noticed; Reuter, *l. c.* p. 126.

Parhypsylla, g. n., Riley, Canad. Ent. xv. p. 157. Allied to *Diaphorina*

and *Calophya*, Loew. Types, *P*[illegible] p. 235, Corrientes.
grandis, Riley), fig. 6, and *celtidis-m*[illegible]nos Aires.
Trioza binotata, sp. n., Löw, Wien. ẽ p. 238, Entre Rios.

APHIDIDÆ.

BUCKTON, G. B. Monograph of the British *Aphides*, vol. iv. (Ray Soc.) London: 1883, 8vo, pp. ix. & 228, pls. D–H & i., cxv.–cxxxiv. (*Cf.* Lichtenstein, Ent. M. M. xx. pp. 79–81.)

The present volume completes the work, and includes the two last genera of the *Pemphiginæ*, and the *Chermesinæ* and *Rhizobiinæ*; and chapters on *Aphides* in their economical relation to ants; reproduction of *Aphides* (including the anatomy of the various forms); biology and morphology of *Aphides*; introductory notes on the antiquity of the *Hemiptera*, and particularly with regard to the *Aphidinæ* as represented in the sedimentary rocks and in amber; bibliography and indices. The following synonymy occurs:—*Thelaxes dryophila*, Westw. (= *Cinara quercus*, Moseley), *Glyphina betulæ*, Heyd. (? = *alni*, Pass.), *Chermes corticalis*, Kalt. (? = *strobi*, Hart., and *piceæ*, Ratz), *laricis*, Hart. (= *geniculatus*, Ratz., and ? *Anisophleba hamadryas*, Koch), *Phylloxera punctata*, Licht. (= *quercus*, Walk., and ? *coccinea*, Kalt.), *vastatrix*, Planch. (= *Pemphigus vitifolii*, Fitch, and *Peritymbia vitisana*, [illegible]estw.), *Forda formicaria*, Heyd. (= *Rhizotecus vacca*, Hart.).

GIRARD, M. La Phylloxera. 4e edition. Paris: 1883, 12mo, pp. 127, map and figs.

[Not seen by Recorder.]

HORVÁTH, G. v. Rapport annuel de la station phylloxérique hongroise (1ière année, 1881). Buda-Pest: 1882. (*Cf.* Wien. ent. Z. ii. pp. 44 & 45.)

——. Sur les migrations des Pucerons. Rev. d'Ent. ii. pp. 64–67.

Relates to *Tetraneura ulmi* and *rubra*, Licht., and to *Pemphigus zeæmaidis*, Duf. The writer confirms several of the results obtained by Lichtenstein, but dissents from some of his theories. Lichtenstein remarks on this paper; *op. cit.* pp. 94 & 95.

LICHTENSTEIN, J. De l'évolution biologique des pucerons en général et du *Phylloxera* en particulier. Paris & Bordeaux: 1883, 8vo, pp. 39. (*Cf.* also Assoc. Fr. xi. pp. 475–480.)

The writer admits 7 European species of *Phylloxera*, all, except *P. vastatrix*, feeding on oak.

——. Les migrations des pucerons confirmées. Évolution biologique complète du puceron de l'ormeau (*Tetraneura ulmi*, Aut.). C.R. xcvii. pp. 197–199, Ann. N. H. (5) xii. pp. 282 & 283, Ent. M. M. xx. pp. 61–63, and Rev. d'Ent. ii. pp. 163 & 164.

Forda viridana, Buckton, *l. c.* p. 8Afidi di Calabria. Bull. Ent. Ital. berland.

Tychea eragrostidis, id. *l. c.* p. 89era, revised list of species, and list of *Endeis formicina*, Cheviot

[illegible]a (? = *bella*, Ko

MEINADIER, —. L'Invasion Phylloxérique en France. Mém. Soc. Seine & Oise, xii. pp. 346–381.

WILL, W. Zur Bildung des Eies und des Blastoderms bei den viviparen Aphiden. Arb. Inst. Würzb. vi. pp. 217–258, pl. xvi.

A critical paper, in which the author summarizes the observations of previous writers, and compares them with his own. The species most carefully examined were *Aphis rosæ*, *rosarum*, *salicis*, and *pelargonii*. The method of investigation is also explained.

Buckton's and Lichtenstein's publications on *Aphides* discussed, with notes on *Phylloxera vastatrix*, which has undoubtedly appeared in Victoria; Dunning, P. E. Soc. 1883, pp. l.–lv.

On the presence of chlorophyl in *Aphididæ*; Macchiati, Bull. Ent. Ital. xv. pp. 163 & 164.

Lichtenstein discusses his nomenclature of the various phases of *Aphididæ*; Am. Nat. xvii. pp. 879–881.

Migration of *Aphides* discussed; Buckton, Ent. M. M. xx. pp. 110–112, and Lichtenstein, Am. Nat. xvii. p. 1176.

Remedy for American blight; Bach, Revue Horticole, quoted in Gard. Chron. (2) xx. p. 114.

In *Tetraneura*, *Schizoneura*, and *Pemphigus*, there are two winged broods annually, and the last brood in the year consists of wingless females, with only one winter egg; but in *Aphis* there are three winged broods annually, and the last brood in the year deposits several eggs: Kessler, Deutsche E. Z. xxvii. pp. 26 & 27.

Notice of galls from S. France on *Pistacia terebinthus* and *lentiscus*, produced by various species of *Pemphigus*, and by *Haploneura lentisci*; Schlechtendal, Z. Naturw. lvi. p. 92.

Tetraneura and *Pemphigus*. Horváth discusses the neuration of various species, and defines them more exactly; *P. zeæ-maidis*, Duf., appears to be the radicicole form of *T. ulmi*: Rev. d'Ent. ii. pp. 310–312, figs.

Siphonophora rosæ recorded from N.W. Provinces of India; Buckton, Brit. Aph. iv. pp. 180 & 181. *S. rudbeckiæ*, Fitch, supposed to inflict a bite; Swan, Am. Nat. xvii. p. 977.

Aphis sp. on ivy: habits, oviposition, and transformations described, also enemies and attendant ants noticed; Robson, Sci. Goss. xix. pp. 105–107, 150, & 151. *A. mali*, Fabr., popularly described and figured; Saunders, Canad. Ent. xv. pp. 96 & 97, fig. 5. *A.* (*Myzus*) *cerasi*, Fabr., noticed and figured; Westwood, Gard. Chron. (2) xix. p. 668.

Schizoneura sp. destructive to wheat in Russia noticed; Lindeman, Bull. Mosc. lviii. (1) pp. 163–167. *S. corni*, Fabr., and *lanigera*, Hausm.: life-history (*S. vagans*, Koch, is the autumnal brood of the former); Kessler, Ber. Ver. Cassel, 29 & 30, pp. 90–100. *S. imbricator*, Fitch (?):

fungus growth upon honey-dew ; p. 235, Corrientes.
S. ulmi, Linn., and its insect-enemies os Aires.
ix. p. 153. p. 238, Entre Rios.

Tetraneura rubra, Licht. Lichtenstein's acc
lated ; Ann. N. H. (5) xi. pp. 144–146.

Phylloxera vastatrix. Life-history and enemies discussed : Saunders, Rep. E. Soc. Ont. 1882, pp. 62–67, figs. 75–81 ; Gard. Chron. (2) xix. pp. 20, 409, 410, & 730, xx. pp. 261, 262, 274, 437, 506, 507, 534, 535, & 696 ; Bull. Soc. Pad. ii. pp. 28–33 ; Am. Nat. xvi. p. 1288 ; Z. Naturw. lvi. pp. 95 & 96 ; Rev. d'Ent. ii. pp. 148–151. Winter-egg ; Targioni-Tozzetti & Balbiani, Bull. Ent. Ital. xv. pp. 169–186. Dipterous parasites, including a *Cecidomyia* ; Riley, Fyles, & Hagen, Canad. Ent. xv. pp. 39, 83, & 84. Relations with *Gamasus*; Canestrini, Bull. Soc. Pad. ii. pp. 21–28. Occurrence in Sardinia ; Costa, Atti Ist. Nap. (3) ii. No. 9, pp. 3 : in California ; Wheeler, Ent. xvii. pp. 199 & 200 : in Australia ; Boutan, Bull. Soc. Acclim. (3) x. p. 35.

Phylloxera vitifoliæ, Fitch (= *vastatrix*, Planch.), noticed and figured; Lintner, Rep. Ins. N. York, i. pp. 4 & 5.

Ceratiphis latanieæ, Boisd., noticed ; Anderson, Ent. xvi. p 120. Redescribed and figured ; *id.* Sci. Goss. xix. pp. 244–246, figs. 140–147.

Chermes viridis and *coccineus*, Ratz. (= collectively *abietis*, Linn.), and their enemies, discussed ; Keller, Kosmos, xiii. pp. 472–475.

New genera and species :—

Schlechtendalia, Lichtenstein, S. E. Z. xliv. p. 242. Allied to *Pemphigus*. Type, *S. chinensis*, sp. n., *ibid.*, China.

Siphonophoroides, Buckton, Brit. Aph. iv. p. 176. Allied to *Siphonophora*. To include *S. antiqua* and *simplex*, spp. nn., *l. c.* p. 176, pl. cxxxiii. figs. 1 & 2, N. America (fossil).

Archilachnus, id. *l. c.* p. 177. Allied to *Lachnus* (?). Type, *A. pennatus*, sp. n., *ibid.* pl. cxxxiii. fig. 3, N. America (fossil).

Anconatus, id. *ibid.* Allied to *Schizoneura* and *Lachnus*. Type, *A. dorsuosus*, sp. n., *ibid.* pl. cxxxiii. fig. 4, N. America (fossil).

Schizoneuroides, id. *l. c.* p 178. Allied to *Schizoneura* (?). Type, *S. scudderi*, sp. n., *ibid.* pl. cxxxiii. fig. 5, N. America (fossil).

Pterostigma, id. *ibid.* Allied to *Lachnus* (?). Type, *P. recurvum*, sp. n., *ibid.* pl. cxxxiii. fig. 6, N. America (fossil).

Siphonophora antherinii, Macchiati, Bull. Ent. Ital. xv. p. 228, Reggio.

Rhopalosiphum galeactitis, id. *l. c.* p. 233, Gallico.

Myzus portulacæ, id. *l. c.* p. 235, Reggio.

Aphis prunicoleus, Ashmead, Pacific Rural Press, July 2, 1881 (*cf.* Psyche, iv. p. 16), Florida.

Lachnus platanicola, Riley, Am. Nat. xvii. p. 198, and Ent. xvi. p. 239, United States. (Its honey-dew is attractive to other insects.)

Glyphina pilosa, Buckton, Brit. Aph. iv. p. 16, pl. cxvi. figs. 1–4, England.

Chermes atratus, id. *l. c.* p. 39, pl. cxx. figs. 5 & 6, Haslemere, Surrey.

Forda viridana, Buckton, *l. c.* p. 85, pl. cxxvii. figs. 1 & 2, Northumberland.

Tychea eragrostidis, id. *l. c.* p. 89, pl. cxxviii. figs. 5 & 6, Britain.

Endeis formicina, Cheviot, figs. 1 & 3, *pellucida*, figs. 2 & 4, p. 91, and *carnosa* (? = *bella*, Koch), figs. 5–8, Beckenham, p. 92, *id. l. c.* pl. cxxix.

Rhizobius poæ, pl. cxxix. figs. 9–14, Northumberland, p. 93, and *jujubæ*, India (N.W. Provinces), p. 181, *id. l. c.*

COCCIDÆ.

BLANCHARD, R. Les Coccides Utiles. Meulan: 1883, pp. 116.
[Not seen by Recorder; noticed in Am. Nat. xvii. p. 1177.]

COLVÉE, P. Nuevos Estudios sobre algunos insectos de la familia de los Coccidos. Valencia: 1882. (*Cf.* Wien. ent. Z. ii. p. 43.)

The first part includes descriptions of 6 species, 3 of which, *Eriococcus araucariæ*, *Leucaspis lawi*, and *Aspidiotus oleastri*, are described as new.

COMSTOCK, J. H. Second Report on Scale-Insects, including a monograph of the subfamily *Diaspinæ* of the family *Coccidæ*, and a list, with notes, of the other species of Scale-Insects found in North America. 2nd Rep. Dep. Ent. Cornell Univ. Stat. pp. 47–143, pls. i.-iv. & woodcuts. (*Cf.* Wien. ent. Z. ii. pp. 257 & 258.)

168 species are enumerated. The following synonymy occurs:—*Aspidiotus aurantii*, Mask. (= *citri*, Comst.), *genistæ*, Westw. (= *ulicis*, Sign.), *Diaspis ostreiformis*, Curt. (= *circularis*, Fitch), *calyptroides*, Costa (= *Aspidiotus echinocacti*, Sign.), *Chionaspis furfurus*, Fitch (= *cerasi*, Fitch, and *harrisi*, Walsh), *salicis*, Linn. (= *fraxini*, Sign., and *Aspidiotus salicis-nigræ*, Walsh), *Uhleria fiorinia*, Targ.-Tozz. (= *Fiorinia pellucida*, Targ.-Tozz., and *Chermes arecæ*, Boisd.), *gigas*, Mask. (= *F. astelia*, Mask.), *Parlatoria pergandii*, Comst., and var. *camelliæ* described (p. 114, pl. ii. fig. 4), *proteus*, Curt. (= *orbicularis*, Targ.-Tozz.), *zizyphi*, Luc. (= *Kermes aurantii*, Boisd., and *P. lucasi*, Targ.-Tozz.), *Mytilaspis pomorum*, Bouché (= *Aspidiotus conchiformis*, auct., *pyrus-malus*, Kenn., *juglandis*, Fitch, and *Mytilaspis pomicorticis*, Riley), *Mytilaspis abietis*, Schrank (= *arborum* and *pineti*, Schrank), *conchiformis*, Gmel. (= *Diaspis lineris*, Costa), *Aonidia lauri*, Bouché (= *purpurea*, Targ.-Tozz.), *Leucaspis pini*, Hart. (= *candida*, Targ.-Tozz.), *Dactylopius adonidum*, auct. (= *Lecanium phyllococcus*, Ashm.), *Pulvinaria innumerabilis*, Ruthv. (= *Lecanium acericorticis*, *acericola*, and *machiræ*, Walsh & Riley).

LÖW, F. Der Schild der Diaspiden. Verh. z.-b. Wien, xxxii. pp. 513–522.

After discussing the structure of the shield in both sexes, the writer characterizes the subfamily *Diaspidæ*, and adds a table of genera.

[Löw, F.] Ueber eine neue Nadelholz-Coccide und den Dimorphismus der Cocciden-Mannchen. Wien. ent. Z. ii. pp. 3–7.

Relates to *Leucaspis pusilla*, sp. n., *L. pini*, Hart., described for comparison, *Chionaspis salicis*, Linn., *Gossyparia ulmi*, Fabr., and *Acanthococcus aceris*, Sign. In the last 3 species, both winged and apterous males are met with.

On the introduction and spread of scale-insects in America, and report on experiments in destroying them; Riley, Rep. Dep. Agric. 1883, pp. 152–159. Effects of frost; Voyle, Bull. Dep. Agric. Ent. ii. p. 33. Larvæ conveyed from tree to tree by spiders; Hubbard, *tom. cit.* pp. 30 & 31.

Chilaspis læwi, Wachtl, appears to be an indigenous and not an introduced species in Austria; Mayr, Wien. ent. Z. ii. pp. 7 & 8:

Ritsemia. Note on life-history; Lichtenstein, Am. Nat. xvii. p. 977.

Chionaspis salicis, Linn., noticed; Reuter, Medd. Soc. Fenn. ix. pp. 125 & 126.

Fiorinia, Targ.-Tozz., founded on a specific name, renamed *Uhleria*; Comstock, Rep. Dep. Ent. Cornell Univ. Stat ii. p. 100.

New species :—

Pulvinaria ericæ, Löw, Wien. ent. Z. ii. p. 115, Austria.

Boisduvalia piceæ, id. *l. c.* pp. 267–269, Austria.

Dactylopius caricus, Gennadius, Ann. Soc. Ent. Fr. (6) iii. p. 31, Asia Minor.

Monophlebus hellenicus, id. *l. c.* p. 32, Attica (? = *M. fuscipennis*, Burm.).

Aspidiotus abietis, fig. 1, Ithaca, New York, p. 57, *mimosæ*, fig. 3, Tampico, Mexico, p. 62, *A.* (?) *parlatorioides*, fig. 5, Florida, p. 64, *personatus*, pl. iii. figs. 2 & 2*a*, Havana, p. 66, *A.* (?) *sabalis*, pl. iii. figs. 1 & 1*c*, Florida, p. 67, *smilacis*, fig. 6, Massachusetts, p. 69, *spinosus*, fig. 7, Ithaca, New York, p. 70, and *signoreti* (= *nigra*, Sign.), fig. 8, p. 82, Comstock, Rep. Cornell Univ. Stat. ii.

Diaspis cacti, id. *l. c.* p. 91, fig. 11, Ithaca, New York; *D. aurantii*, Signoret, Bull. Soc. Ent. Fr. (6) iii. p. lxiii., British Guiana.

Leucaspis epidaurica, Gennadius, *l. c.* p. 31, Greece; *L. pusilla*, Löw, *l. c.* p. 3, Austria.

Chionaspis (?) *biclavis*, fig. 12, & pl. ii. fig. 11, Ithaca, New York, p. 99, *citri* (= *evonymi*, pt., Comst.), fig. 13, Norfolk, Virginia, p. 100, *lintneri*, fig. 14, New York, p. 103, and *spartinæ*, pl. iii. figs. 3 & 3*a*, Massachusetts, p. 106, Comstock, *l. c.*

Poliaspis cycadis, id. *l. c.* p. 126, fig. 15, Ithaca, New York.

Aleurodidæ.

Aleurodes lacerdæ, sp. n., Signoret, Bull. Soc. Ent. Fr. (6) iii. p. lxiii. (on *Anona sylvatica* at Lacerda).

(ANOPLURA.)

PEDICULIDÆ.

STRÖBELT, O. Inaugural Dissertation zur Erlangung der Doctorwürde einer hohen philosophischen Facultät der königlichen Akademie zu Münster. Düsseldorf: 1882.

[Not seen by Recorder, but translated by Dallas, Ann. N. H. (5) xi. pp. 73–108, pl. iii.] *Hæmatopinus longirostris*, Burm., = *vituli*, Linn. The writer discusses its bibliography, systematic position, and external and internal anatomy, at too great length to allow of any abstract being here attempted.

Pediculus vestimenti. No difference between Russian and N. American specimens; Leidy, P. Ac. Philad. 1883, p. 46.

VERMES.

BY

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PLATYHELMINTHES.

1. Braun, M. Zur Frage des Zwischenwirthes von *Bothriocephalus latus*. Zool. Anz. vi. pp. 97–99 (*cf.* also *l. c.* p. 626).
2. Cobbold, T. S. The Parasites of Elephants. Tr. L. S. (2) ii. [1882] pp. 223–258.
3. Francotte, P. Note sur l'anatomie et l'histologie d'un Turbellarie rhabdocèle. Bull. Ac. Belg. lii. pp. 723–735, 1 pl.; Bull. Soc. Belg. Micr. ix. pp. 143–151.
4. Gaffron, E. Zum Nervensystem der Trematoden. Zool. Anz. vi. pp. 508 & 509.
5. Griesbach, H. Ueber das Nervensystem von *Solenophorus megalocephalus*. Arch. mikr. Anat. xxii. pp. 365–368.
6. ——. Beiträge zur Kenntniss der Anatomie der Cestoden. *L. c.* pp. 525–583, pls. xxi.–xxiii. (See also Biol. Centrabl. iii. p. 268.)
7. Hubrecht, A. A. W. Studien zur Phylogenie des Nervensystems. II. Das Nervensystem von *Pseudonematon nervosum*, g. & sp. nn. Versl. Ak. Amst. xxii. 19 pp., 2 pls.
8. Jijima, J. Ueber die Embryologie von *Dendrocœlum lacteum*. Zool. Anz. vi. pp. 605–610. (Bull. Sci. Nord. vi. pp. 100–105.)
9. ——. Ueber den Bau des Süsswasser-Tricladen. *L. c.* pp. 579–585.
10. Jackson, W. H. Note on the Life-history of *Fasciola hepatica*. Zool. Anz. vi. pp. 248–250.
11. Linstow, O. von. Nematoden, Trematoden, und Acanthocephalen, gesammelt von Prof. Fedtschenko in Turkestan. Arch. f. Nat. xlix. pp. 274–313, pls. vi.–ix.
12. Man, J. G. de. *Geocentrophora sphyrocephala*, de M., und *Bdellocephala bicornis*, de M. Zool. Anz. vi. pp. 680 & 681.
13. Mégnin, P. Sur la reproduction directe des Ténias. C. R. xcvi. pp. 1378 & 1379. (Ann. N. H. 5, xi. pp. 457 & 584.)

14. Metschnikoff, E. Die Embryologie von *Planaria polychroa*. Z. wiss. Zool. xxxviii. pp. 331–354, pls. xv.–xvii. (See also Biol. Centralbl. iii. p. 698.)

15. Milne-Edwards, A. Rapport sur les travaux de la Commission chargée d'étudier la Faune Sous-marine dans les grandes profondeurs de la Mediterranée et de l'Océan Atlantique. Arch. Miss. sci. (3) ix. 63 pp., 2 maps.

16. Sabatier, A. De la Spermatogenèse chez les Némertiens. Mém. Ac. Montp. x. [1882] pp. 385–397, pls. xix.–xxi.

17. Salensky, W. Développement de la *Borlasia vivipara*. Translated from Biol. Centralbl. ii. p. 740, in Bull. Sci. Nord. v. pp. 464–469.

18. Schauinsland, H. Beitrag zur Kenntniss der Embryonal-entwickelung der Trematoden. Jen. Z. Nat. xvi. pp. 465–527, pls. xix.–xxi.

19. Schulze, F. E. *Trichoplax adhærens*, g. & sp. nn. Zool. Anz. vi. pp. 92–97.

20. Villot, A. Mémoires sur les cystiques des Ténias. Ann. Sci. Nat. (6) xv. Art. No. 4, 61 pp., 1 pl.

21. Weinland, D. F. Zur Entwickelungsgeschichte des Leberegels (*Distoma hepaticum*, L.). JH. Ver. Württ. xxxix. pp. 89–98.

22. Ziegler, H. E. *Bucephalus* und *Gasterostomum*. Z. wiss. Zool. xxxix. pp. 537–572, pls. xxxii & xxxiii.

Contributions to the International Fisheries Exhibition,* London, 1883.

See the Official Catalogue.

United States of America. Cat. B. Economic *Vermes*, pp. 25 & 26 (by R. Rathbun). Washington : 1883. On Leeches, p. 16.

China. Leeches and Worms of Swatow for Bait, p. 31 of Special Catalogue. Shanghai : 1883.

India. Worms used for bait, p. 153 (Madras) of Catalogue of the Exhibits in the Indian Section, by F. Day.

Sweden. Dickson's Collection of Worms, pp. 98 & 99 (see also Special Catalogue of Dickson's Collection from the Gothenburg Museum, pp. 16–20), of Special Catalogue "Sweden." Stockholm : 1883.

Geographical Distribution.

List of deep-sea Worms ; Norman, Tr. North. Durh. viii. pp. 126 & 127.

On the deep-sea *Vermes* of the Mediterranean and the Atlantic, see Milne-Edwards, (15) pp. 24 & 47.

On the *Vermes* of the Mediterranean, consult Marion, "Esquisse d'une topographie zoologique du Golfe de Marseille," and "Considérations sur

* These are of little scientific value.—Rec.

les faunes profondes de la Mediterranée;" Ann. Mus. Marseille, Zool. i. pts. 1 & 2.

On the *Vermes* of Capé Verde Islands, see De Rochebrune, N. Arch. Mus. (2) iv. pp 228–237.

Anatomy and Development.

In a most valuable and suggestive article, A. A. W. Hubrecht (Q. J. Micr. Sci. xxxiii. pp. 349–368) discusses the apparent resemblance between the *Nemertinea* and the "Ancestral Form of the *Chordata*."

Francotte (3) describes the structure of *Derostomum benedeni*, sp. n., found at Andenne; he regards the lacunæ in the body as representing a true cœlom, and reports the presence of hæmoglobin in the anterior part of the body.

Gaffron (4) finds that the two ventral nerves of the *Trematoda* unite at the hinder end of the body, as do also the dorsal, but that the lateral nerves break up and fuse with one another. All the longitudinal trunks are regularly connected with one another by a system of commissures.

In *Solenophorus* (5), the ganglia of the scolex are arranged in two planes, in the form of a cross; the two longitudinal trunks in the strobila take their origin from the median ganglia of the scolex, and seem to represent an undifferentiated ventral medulla.

Hubrecht's (7) *Pseudonematon nervosum* has a nervous system which forms a continuous layer around the body, lying just inside the layer of circular muscles. There is no cephalic enlargement. This paper is reviewed by Minot (Science, ii. p. 382).

Jijima (9) regards the space between the branched connective-tissue cells of the mesenchyma as representing the body-cavity. Mucous and salivary glands can be distinguished. The cocoon is not formed in the uterus, but by a special glandular organ. The primary excretory canals of *Dendrocœlum lacteum* unite with one another by a transverse vessel, placed in front of the head.

His observations on development (8) in many points confirm those of Metschnikoff (14), who, though particularly desirous of finding an explanation of the intercellular mode of digestion, sought it in vain. His most striking observation is that of the development of a pharynx before the definite differentiation of the ectoderm and mesoderm; but analogous embryonic adaptations have, of course, been observed elsewhere.

Schauinsland (18) insists on the close resemblances between the developmental histories of the *Trematoda* and of the *Mesozoa*.

Villot (20) divides cystic stages into true cysticerci and cysticercoids; the latter fall into two groups, according as the caudal vesicle is formed by an endogenous or exogenous mode. To the former belong *Polycercus* (represented by the form found in *Lumbricus terrestris*) and *Monocercus* (by the so-called *Cysticercus arionis*); to the latter belong *Cercocystis* (cystic worm of the larva of *Tenebrio molitor*), *Staphylocystis* (for *S. bilarius* and *S. micracanthus*), and *Cryptocystis* (for the form found in the visceral cavity of *Trichodectes canis*). The steps between the complete independence of the proscolex and cystic stages, as seen in *Urocystis* and

Cryptocystis, and the suppression of the budding of the caudal vesicle in true cysticerci, are explained by the enunciation of the law that the complication of development and of organization are in inverse ratio to one another.

Ziegler (22) finds that the cercariæ of *Bucephalus*, after escaping from the freshwater mussel, most often make their way into the Rudd (*Leuciscus erythrophthalmus*), but the next host that eats the Rudd is not yet known.

Braun (1) reports on some successful experiments on human subjects.

The direct reproduction of *Tænia* is exemplified by a case reported by Mégnin (13), who observed in a watched dog small specimens of *T. serrata*, which he thinks must have been developed from ova of larger specimens found in the same animal.

Young of Liver-fluke; Zool. Anz. vi. pp. 322 & 323.

On Hydatid disease in Australia; Tr. R. Soc. S. Austr. 1883, pp. 1–26.

The Recorder has not been able to see J. Raum's Inaug. Diss. on the Development of Cysticerci; A. Pachinger's (Czech) note on *Distoma cygnoides*; or A. Prunac on the Liver-fluke [*cf.* Zool. Anz. vii. pp. 215 & 216].

Genera and Species.

Bipalium sumatrense, *B. javanum*, spp. nn., Loman, Zool. Anz. vi. p. 158.

Trichoplax adhærens, g. & sp. nn., Schultze (19).

Linstow (11) describes as new:—

Distomum plesiostomum, *choledochum*, *nigrum*, *longissimum*, *sulcatum*.

Monostomum nigro-punctatum.

Cobbold (2) describes as new, *Amphistoma ornatum*, *papillatum*; and has notes on *A. harkeri* and *Fasciola jacksoni*.

Geocentrophorus and *Bdellocephala*; see De Man (12).

Bothriocephalus crassiceps, *B. rugosus*, in the Cod; *B. capillicollis*, sp. n. in a species of Carp: Mégnin, Bull. Soc. Z. Fr. viii. p. 154.

Distoma dendriticum, *ventricosa*[*-sum*], *coccineum*, *papillosum*, *Tetrarrhynchus attenuatus*, and *Bothriocephalus xiphiæ* in Sword-fishes; True, in Brown-Goode's Rep. Comm. Fish & Fisher. 1880. Washington: 1883, pp. 344 & 345.

On the Liver-fluke and its relations to *Limnæa truncatula*; see J. of Conch. iv. pp. 10 & 11.

Ligula mansoni, sp. n., a new human Cestode; J. L. S. xvii. pp. 78–83.

NEMATOHELMINTHES.

23. Beddard, F. E. On a New Nematoid Worm (*Dicelis pleurochætæ*). P. Phys. Soc. Edinb. vii. pp. 229–234, pl. iv.

24. Beneden, E. van. L'Appareil sexuel femelle de l'Ascaride mégalocéphale. Arch. Biol. iv. pp. 93–142, pl. iii.

25. Chatin, J. Sur un Nématode parasite de l'oignon vulgaire. C. R. xcvii. pp. 1503–1505.

26. [Chatin J.] La Trichine et la Trichinose. Paris: 1883, 8vo, 257 pp., 15 pls.

27. Cobbold, T. S. On *Simondsia paradoxa* and its probable affinity with *Sphærularia bombi*. Tr. L. S. (2) ii. pp. 357–361, pl. xxxvii.

28. Drasche, R. v. Revision der in der Nematoden-Sammlung des k. k. zoologischen Hofcabinets befindlichen original Exemplare Diesing's und Molin's. Verh. z.-b. Wien, xxxiii. pp. (α) 107–118 & (β) 193–218, pls. iii.–v. & xi.–xiv.

29. Hallez, P. Sur la Spermatogénèse et les phénomènes de la fécondation chez l'*Ascaris megalocephala*. Bull. Sci. Nord. vi. pp. 132–135.

30. Leuckart, R. Ueber die Lebensgeschichte der sogennanten *Anguillula stercoralis* und deren Beziehungen zu der sogennanten *A. intestinalis*. Abh. sächs. Ges. 1882-83, pp. 85–107.

31. Linstow, O. Ueber die Zwischenwirthe des *Gordius aquaticus*. Zool. Anz. vi. pp. 373 & 374.

32. Mégnin, P. Mémoire sur les Hématozoaires du Chien. J. Anat. Phys. xix. pp. 172–204.

33. Nussbaum, M. Zur Befruchtuug bei den Nematoden. Zool. Anz. vi. p. 515.

34. Perroncito, E. L'anémie des mineurs au point de vue parasitologique. Arch. Ital. Biol. ii. pp. 315–334.

35. Raillet, A. Sur le mâle de l'Oxyure du Cheval (*Oxyuris curvula*, Rud.). Bull. Soc. Z. Fr. viii. pp. 211–216, pl. xi.

36. Rohde, E. Beiträge zur Kenntniss der Anatomie der Nematoden. Schneider's Zool. Beitr. (1) i. pp. 11–33, pls. ii.–vi.

37. Schneider, A. Ueber die Entwickelung der *Sphærularia bombi*. Schneider's Zool. Beitr. (1) i. pp. 1–10, pl. i.

Anatomy and Development.

Chatin's (26) work is an important contribution to and summary of the facts regarding Trichinosis.

On the history of the development of *Trichina*; see Owen, J. Anat. Phys. xix. pp. 108–110.

The *Tylenchus* found by Chatin (25) most closely resembles the *Anguillula* of wheat, but has not the same power of resisting desiccation.

Beddard's (23) new form is interesting as approaching, in some characters, to the free-living forms; this may be due to its lying in a perivisceral cavity (of *Pleurochæta moseleyi*) which is freely open to the exterior by a series of large dorsal pores.

Cobbold (27) finds in *Simondsia* a rosette-shaped uterus which he thinks comparable with the uterus of *Sphærularia*.

The male organs of *Oxyuris* and the female of *Ascaris* are described in detail by Raillet (35) and Van Beneden (24).

Mégnin (32) thinks that embryos of Nematoid worms may give rise to a special form of tuberculosis.

Schneider finds (37) that queen bees infested with *Sphærularia* die in the beginning of June, and do not found a colony. On their death, the Sphærularian embryos are set free; after two ecdyses, they develop into males or females; during their free life, they take no food, and do not propagate; they develop further on reaching the intestine of the bee larvæ, and the time when the young imagines are set free is the same at which the larvæ of the queen appear.

Leuckart (30) finds that the so-called *Anguillula stercoralis* is a stage in the life-history of *A. intestinalis*.

Genera and Species.

Linstow (11) describes as new :—

Ascaris alata, acipenseris, siluri-glanidis, pastoris ("sp. n., inquir.").

Physaloptera striata, dentata, malleus.

Filaria rotundata, squamata, turdi-atrigularis, capræ ("sp. n., inquir.").

Aprocata, g. n., for *A. cylindrica.*

Agomonema rotundatum.

Heteracis curvata, tenuicauda, macrura, gracilis ("sp. n., inquir.").

Oxyuris inflata, lanceolata.

Gordius stylosus, palustris, maculatus.

Mermis paludicola, acuminata, rotundata ("sp. n., inquir."), *drassi.*

There are notes on *Ascaris microcephala, spiculigera*; *Physaloptera abbreviata*; *Filaria tricuspis, microstoma*; *Chiracanthus hispidus*; *Dispharagus spiralis*; *Heteracis lineata, vesicularis*; *Strongylus armatus, contortus*; *Atractis dactylura*; *Oxyuris longicollis*; *Dracunculus medinensis*; *Anguillula recticauda.*

Drasche, in continuation of his revision (28), has notes on and figures of—

Lecanocephalus spinulosus.

Heterochilus tunicatus.

Conocephalus typicus.

Ancyranthus pinnatifidus, bilabiatus.

Elapocephalus octo-cornutus.

Cosmocephalus papillosus.

Tropidocerca paradoxa.

And describes as new :—*Ascaris serrata* and *Cucullanus tridentatus.*

In (β), Drasche notes and figures many of—

Spiroptera nuda, sygmoidea, brevipenis, subæqualis, circularis, verticillus, papillosa, acuminata, excisa, semilunaris, crassicauda, bullosa, penihamata, lanceolata, singularis, quadridentata, conocephala, terdentata, chrysoptera, unilateralis, tercostata, spiralis, helicina, pistillaris, brachystoma, brevisubulata, uni-alata, serpentulus, quadripapillosa, verrucosa, quadri-alata, anacanthura, medio-spiralis, umbellifera, vulco-inflata, coronata, imbricata, vulturis, inflata, vulcaria, anabatis, turdi, ano-labiata, phasianipicti, ardeæ, tenuicauda, pulchella.

Histiocephalus laticaudatus, laciniatus, subulatus.

Dispharagus recto-vaginatus, longe-vaginatus, longe-ornatus, laticeps, crassissimus, rectus, calcaratus, magnilabiatus, echinatus, mamillaris.

Chilospirura posthelica, *erecta*, *uncinipennis*, *hamulosa*, *longe-striata*, *cephaloptera*, *capillaris*.

Physocephalus sexalatus.

He describes as new :—*Spiroptera quadrilabiata*.

Cobbold (27) describes as new :—

Strongylus foliata, *falcifer*.

Dochmius sanzeri.

Filaria smithi.

And has notes on—

Ascaris lonchoptera.

Sclerostoma sipunculiforme.

Strongylus clathratus.

Ascaris clavata in Cod ; adults and larvæ both found : Mégnin, Bull. Soc. Z. Fr. viii. p. 154.

Ascaris inflexa in Hen's egg ; Ernst, Zool. Anz. vi. p. 291.

Ascaris incurva in Sword-Fish ; True, Rep. Comm. U. S. F. C. 1880 (1883), p. 343.

Chætonotus larus ; Fernald, Am. Nat. xvii. pp. 1217–1220.

ACANTHOCEPHALI.

Echinorrhynchus porrigens in "la Baleine franche," *E. brevicollis* in *Balænoptera sibbaldi*, *E. acus* and *E. globulosus* in the Cod ; Mégnin, Bull. Soc. Z. Fr. viii. pp. 153 & 154.

Echinorrhynchus plicatus, *E. acanthotrias*, spp. nn., Linstow (11).

ROTATORIA.

38. Billet, A. Sur les mœurs et les premiers phénomènes du développement de la *Philodina roseola*. Bull. Sci. Nord. vi. pp. 1–10 & 69–84, pls. i. & ii.

39. Crisp, F. New Swiss *Rotatoria*. Zool. Anz. vi. pp. 564.

40. Eckstein, —. Die Rotatorien der Umgegend der Giessen. Z. wiss. Zool. xxxix. pp. 343–443, pls.

41. Hudson, C. T. Five New Floscules ; with a Note on Prof. Leidy's Genera of *Acyclus* and *Dictyophora*. J. R. Micr. Soc. (2) iii. pp. 161–171, pls. iii. & iv.

42. ——. On *Asplanchna ebbesborni*, sp. n. *L. c.* pp. 621–628, pls. ix. & x.

43. Joliet, L. Monographie des Mélicertes. Arch. Zool. Par. (2) i. pp. 131–224, pls. xi.–xiii.

Eckstein (40) gives a most elaborate account of the organization and development of the *Rotatoria*. Among other points of interest, he describes the excretory organs as not having a funnel-shaped opening into the cœlom, but rather a small orifice beneath the club-shaped free end, into which the waste products are driven by a long cilium. He denies to the "winter ova" the limitation as to season, and proposes

rather to speak of them as lasting ova. The effects of the parasitic habit are illustrated by *Seison* and *Albertia*.

Joliet (43) takes a similar view with Eckstein as to the lasting ova. He enters, in great detail, into a discussion of the characters of the ova, and of the relation of fertilized and parthenogenetic products to the subsequent presence of males. The fecundated egg does alone expel the polar globules. Considerable information is afforded as to the earlier stages of development.

Distyla, g. n., for *D. gissensis* and *D. ludwigi* [? *ludovici*], Eckstein (40).

Floscularia hoodi, *F. ambigua*, *F. longicaudata*, *F. regalis*, and *F.* sp., all British; Hudson (41).

Asplanchna ebbesborni, sp. n., Hudson (42).

Hudson (41) gives a "key" to the known species of *Floscularia*.

For a list of the Leicestershire Rotifers, see Rep. Leicest. Soc. 1882–83, p. 28.

For Vejdovsky on *Drilophaga bucephalus*, g. & sp. nn., *cf.* Zool. Anz. vi. p. 356.

GEPHYREA.

44. Haswell, W. A. Preliminary Note on an Australian Species of *Phoronis*. P. Linn. Soc. N. S. W. vii. pp. 606–608.

45. Hatschek, B. Ueber Entwicklung von *Sipunculus modus*. Arb. z. Inst. Wien, v. pp. 61–140, 6 pls.

46. Lankester, E. Ray. On Specimens of the Gephyrean *Hamingia arctica*, Kor. & Dan., from the Hardanger Fjord. Ann. N. H. (5) xi. pp. 37–43.

47. Selenka, E. Die Sipunculiden (as part of Semper's Reisen im Archipel des Philippinen). Wiesbaden: 1883, pt. i. pp. 1–56, 15 pls. (A report is delayed till next year, the work having been completed in 1884.)

48. Sluiter, C. P. Ueber einige Sternwürmer des indischen Archipels. Zool. Anz. vi. pp. 222–228.

Lankester (46) makes a careful comparison of the characters of *Hamingia*, *Thalassema*, and *Bonellia*; he finds that the male of the first resembled that of the last-named genus in being diminutive and attached to the female; the corpuscles of the perivisceral fluid of *Hamingia* are tinged with hæmoglobin.

Hatschek (45) finds many points of agreement in the developmental histories of *Sipunculus* and *Phascolosoma*. The *Echiuridæ* appear to agree completely with the *Annelida* in the essential characters of their development, and ought to form a sub-class among them; while the "*Sipunculacea*" should occupy the place in the system lately occupied by the "*Gephyrea*." In *Sipunculus* the rudiment of the ventral medulla is median, and completely unpaired. The stage of the trochopore-larva is suppressed in *Sipunculus*.

Sluiter (48) has a preliminary notice of his investigations on *Loxosiphon aspergillum* of Quatrefages (for which he institutes a new genus,

Echinosiphon), *Aspidosiphon gigas*, sp. n., and *Thalassema erythrogramma*. In the last he finds, as did Lankester in *T. neptunii*, a communication between the ciliated infundibula and the interior of the anal tubes.

Lampert (Z. wiss. Zool. xxxix. pp. 334–342) describes as new *Thalassema formulosum*, *caudex*, *sorbillans*, and *regrande*; the species of the genus are divided into two groups, in accordance with the separation or not of the longitudinal muscles into bundles. The number of the segmental organs is not of much use to the systematist.

Phoronis australis, sp. n., Haswell (44).

CHÆTOGNATHI.

49. Gourret, P. Sur l'organisation de la *Spadella marioni*, Chætognathe nouveau du Golfe de Marseille. C. R. xcvii. pp. 861–864.

50. ——. Sur la cavité du corps et l'appareil sexuel de la *Spadella marioni*. L. c. pp. 1017–1019.

51. Grassi, B. Die Chætognathen (Fauna und Flora des Golfes von Neapel. Monographie v.). Leipzig: 1883, 4to, 126 pp., 13 pls. (in Italian).

The monograph of Grassi (51) contains an account of the two genera, *Spadella* and *Sagitta*, and the twenty supposed species; the *Chætognatha* are regarded as a very distinct group, particularly interesting at this moment on account of the characters of their peripheral nerve-plexuses.

Gourret's new species (49, 50) appear to be very abundant at Marseilles; the lateral fins are always without rays.

ENTEROPNEUSTI.

For an abstract of his observations on the development of *Balanoglossus*, see Bateson, in John Hopkins Circ. iii. No. 27, p. 4.

ANNULATA.

52. Beddard, F. E. On the Anatomy and Histology of *Pleurochæta moseleyi*. T. R. Soc. Edinb. xxx. pp. 481–509, pls. xxv.–xxvii.

53. ——. Note on some Earthworms from India. Ann. N. H. (5) xii. pp. 213–224.

54. Bourne, A. G. Contributions to the Anatomy of the *Hirudinea*. P. R. S. xxxv. pp. 350–357.

55. ——. Certain Points in the Anatomy of *Polynoina*, and on the *Polynoe* (*Lepidonotus*, Leach) *clava* of Montagu. Tr. L. S. (2) pp. 347–356, pls. xxxiv.–xxxvi.

56. ——. On *Haplobranchus*, a new Genus of Capitobranchiate Annelids. Q. J. Micr. Sci. xxiii. pp. 168–176, pl. ix.

57. Bülow, C. Ueber Theilungs- und Regenerationsvorgänge bei Würmern (*Lumbriculus variegatus*, Gr.). Arch. f. Nat. xlix. pp. 1–96.

58. ——. Die Keimschichten des wachsenden Schwanzendes von *Lumbriculus variegatus*, nebst Beiträgen zur Anatomie und Histologie dieses Wurmes. Z. wiss. Zool. xxxix. pp. 64–96, pl. v.

59. Carlet, G. Le mode de fixation des ventouses de la Sangsue, étudié par la méthode graphique. C. R. xcvi. pp. 448 & 449.

60. ——. Sur la morsure de la Sangsue. *L. c.* pp. 1244–1246.

61. ——. Sur les mécanismes de la succion et de la déglutition chez la Sangsue. *L. c.* pp. 1439 & 1440.

62. ——. Le procédé opératoire de la Sangsue. Ann. Sci. Nat. (6) xv. No. 5, 5 pp.

63. Drasche, R. Ueber die Entwickelung von *Pomatoceros*. Zool. Anz. vi. pp. 503 & 507.

64. Fewkes, J. W. On the Development of certain Worm-larvæ. Bull. Mus. C. Z. xi. No. 9, pp. 167–208, 8 pls.

65. Fischer, —. Ueber *Capitilla capitata*. Beitrag zur Kenntniss der Anatomie und Histologie von Anneliden. Zool. Anz. vi. pp. 271–273 & 487.

66. Gruber, A. Bemerkungen über die Gattung *Branchiobdella*. Zool. Anz. vi. pp. 243–248.

67. Haswell, W. A. A Monograph of the Australian *Aphroditea*. P. Linn. Soc. N. S. W. vii. pp. 250 299, pls. vi.–xi. (see also Biol. Centrabl. iii. p. 504).

68. Horst, R. New Species of the Genus *Megascolex*, Templeton (*Perichæta*, Schmarda), in collections of the Leyden Museum. Notes Leyd. Mus. v. pp. 182–196.

69. Joseph, G. Ueber die dunkelgrünen Pigmentnetze im Körper des Blutegels. Zool. Anz. vi. pp. 323–326.

70. Leidy, J. *Manayunkia speciosa*. P. Ac. Philad. 1883, pp. 204–212, pl. ix.

71. Levinsen, G. M. R. Systematisk geografik Oversigt over de Nordiske *Annulata*, *Gephyrea*, *Chætognathi*, og *Balanoglossi*. Vid. Med. 1882 [1883] pp. 160–251, pl. vii.

72. Ostroumoff, A. Ueber die Art der Gattung *Branchiobdella*, Odier, auf den Kiemen des Flusskrebses (*Astacus leptodactylus*, Esch.). Zool. Anz. vi. pp. 76–78.

73. Pruvot, G. Sur le système nerveux et la classification des Phyllodociens. C. R. xcvii. pp. 1224–1226.

74. Robin, H. Observations sur quelques Annélides de l'étang de Thau. Rev. Sci. Nat. (3) ii. pp. 490–497.

75. Robinet, C. Recherches physiologiques sur la secrétion des glandes de Morren du *Lumbricus terrestris*. C. R. xcvii. pp. 192–194.

76. Saint-Loup, —. Sur la structure du système nerveux des Hirudinées. C. R. xcvi. pp. 1321 & 1322.

77. Salensky, W. Études sur le développement des Annélides. 3, *Pileolaria* ; 4, *Aricia fœtida* ; 5, *Terebella meckeli*. Arch. biol. iv. pp. 143–264, pls. iv.–ix.

78. Schultze, O. Beiträge zur Anatomie des Excretions-apparates (Schleifencanäle) der Hirudineen. Arch. mikr. Anat. xxii. pp. 78–92, pl. i.

79. Timm, R. Beobachtungen an *Phreoryctes menkeanus*, Hoffm., und *Nais*, ein Beitrag zur Kenntniss der Fauna Unter-Frankens. Arb. Inst. Würzb. vi. pp. 109–155, pls. x. & xi. (See also Biol. Centralb[l]. iii. p. 498.

80. Vignal, W. Recherches histologiques sur les centres nerveux de quelques Invertébrés. Arch. Z. expér. (2) i. (*Hirudinea*, pp. 343–374 ; *Oligochæta*, pp. 374–408.)

81. Viguier, C. Sur l'*Exogone* (*Exotokas*, Ehler) *gemmifera*, Pagenstecher. C. R. xcvi. pp. 728–731. (Ann. N. H. 5, xi. pp. 389–391.)

82. Voigt, W. Die Varietäten der *Branchiobdella astaci*, Odier. Zool. Anz. vi. pp. 121–125 & 139–143.

83. Zeppelin, Max [Graf]. Ueber den Bau und die Theilungsvorgänge des *Ctenodrilus monostylos*, sp. n. Zool. Anz. vi. pp. 44–51, and Z. wiss. Zool. xxxix. pp. 614–652, pls. xxxvi. & xxxvii.

Anatomy and Development.

Salensky (77), among various points of great interest, directs attention to a fusion of the ventral ganglia in *Pileolaria*, which, though a well-known phenomenon among Arthropods, has never yet been observed in Annelids. In *Aricia*, as in some other Annelids, some of the ova, though quite normal, do not begin to develop as soon as the rest ; the separation of the ganglia from the ectoderm is very late in being effected. In *Terebella*, true blood-vessels are not developed till very late, but the animal is long before provided with blood, and with circulatory organs in the form of a cavity surrounding the median portions of the digestive tube.

On the segmental organs of *Aphrodita* ; Haswell, P. Linn. Soc. N. S. W. vii. pp. 610 & 611.

Viguier (81) does not confirm the view of Pagenstecher, that asetal forms of *Exogone* are agamic, as he has found males and females in the sexual condition, both with and without setæ.

The mode of division in *Ctenodrilus monostylos* (83) is more primitive than in *C. pardalis*, for there is no zone of gemmation. *Ctenodrilus* has relations to the *Polygordiidæ*, but also to the Oligochætous Naids, while

in other points it has affinities to the *Polychæta*. Its exact systematic cannot as yet be fixed. See also Biol. Centralbl. iii. pp. 14–20, and P. Fraisse, *tom. cit.* pp. 617–627.

G. Pruvot (73) discusses the characters of the nervous system of Annelids, and proposes to divide the *Phyllodocidæ* into two groups, one with five, and one with four antennæ. He founds a new genus, *Nothis*, remarkable for having no dorsal cirrus on the third segment.

H. A. Robin (Bull. Soc. Philom. 1882, 7 pp.), has some notes on *Pignosyllis pulligera* and *Grubea limbata*; the young have ciliated pits, which are regarded as analogous to those of the *Nemertinea*, but they do not seem to be possessed by the adult.

Bülow (58) failed to find any zone of gemmation in *Lumbriculus variegatus*; a worm was cut into fourteen pieces, thirteen of which grew up into complete individuals.

Bourne (54) finds that the cœlom of Leeches is a schizocœle; in some cases, it becomes more or less completely filled up by the growth of connective tisssue; this process may be distinguished as that of diacœlosis, or scattering of the cœlom. When new spaces are developed, we have pseudocœlosis, and the primary and secondary cœlom may exist side by side.

"Annelid Messmates with a Coral"; J. W. Fewkes, Am. Nat. xvii. pp. 595–597.

Methods of studying *Annelida*; W. A. Haswell, N. Z. J. Sci. i. pp. 305–307.

Trouessart's note on the tubuliform castings of Earthworms in France (C. R. 1882) is translated in Ann. N. H. (5) xi. pp. 666 & 667.

Saint-Loup (76) detected in all the *Hirudinea* which he examined, the unpaired nerve originally described by Brandt in *Hirudo*.

Carlet (59–62) has entered in detail into the manner by which the Leech effects its bite.

For a general account of the Leech, and of the *Hirudinea*, see 'Leech,' Encycl. Brit. (9) xiv. pp. 450–455.

Schneider (Zool. Beitr. 1. i. p. 62) finds carbonate of calcium in the teeth of Leeches (as Leydig did before him).

Schultze (78) finds an ascending series of complications in the branching and mode of coiling of the segmental tubes of *Aulostomum* and *Hirudo*, as compared with *Clepsine* and *Nephelis*. The absence of ciliated infundibula in certain forms is to be regarded as due to degeneration.

O. Grimm, "Fishing and Hunting on Russian Waters," Int. Fish. Exh. [London: 1883 (St. Petersburg)], has some notes on the Leeches of Russia (p. 53).

Genera and Species.

Haswell (67) describes—

Aphrodita australis, Baird, *A. terræ-reginæ*, sp. n.

Hermione brachyceras, *H. macleari*, *H.* (*Aphrogenia*) *dolichoceras*, spp. nn.

Triceratia, g. n. "Similar to *Hermione*, but with three tentacles on

the præstomium, and without barbed setæ; scales covered with a layer of felted hairs." For *T. araeoceras* sp. n.

Iphione ovata, Kinberg, *I. fimbriata*, Quatrefages.

Thormora jukesi, Baird, *T. argus* (Val. sp.).

Lepidonotus oculatus, Baird, *L. striatus*, Kinberg, *L. jacksoni*, Kbg., *L. stellatus*, Baird, *L. bowerbanki*, Baird, *L. melanogrammus*, *L. lissolepis*, *L. simplicipes*, *L. acololepis*, *L. torresiensis*, *L. dictyolepis*, spp. nn.

Antinoe wahli, Kbg. (*Polynoe mytilicola*, Haswell), *A. pracelara*, *A. ascidiicola*, spp. nn.

Polynoe asterolepis, *P. ochthæbolepis*, spp. nn.

Thalanessa microceras, sp. n.

Levinsen (71) describes and has notes on:—

Dysponetus pygmæus.

Trachelophyllum luetkeni, g. & sp. nn. (allied to *Eteone*).

Eteone striata, *villosa*, spp. nn.

Nauphanta celox.

Staurocephalus erucæformis [*erucif-*].

And there are keys to all the genera and species mentioned.

A new family, *Nerillidæ*, is instituted for *Nerilla*, Schmidt.

Haplobranchus æstuarinus, g. &. sp. nn., Isle of Sheppey, England and mouth of Liffey, Ireland, Bourne (56).

Haswell (P. Linn. Soc. N. S. W. vii. pp. 633–640, pl. xii.) describes the following new tubicolous Annelids:—

Eupomatus elegans, Port Jackson.

Ammochares tenuis, Port Jackson.

Clymene integrinatis, Port Jackson.

Sabellaria (*Hermella*) *australiensis*, Thursday Island.

Amphicteis foliata, Port Molle.

Heterophenacia renouardi, sp. n., and

Protula meilhaci, sp. n., Marion; Ann. Mus. Mars. i. No. 2, p. 16.

Onuphis jourdei, sp. n., *id. op. cit.* p. 44, from the Mediterranean.

Annelids of Southport; Rep. Brit. Ass. 1882, pp. 544–546.

Beddard (52) discusses the characters of *Megascolex* and *Perichæta*; describes as new *Perichæta armata*, *P. m'intoshi* [*macint-*], and *Typhæus orientalis*, g. & sp. nn., an intractitellian form, with prostate glands in the form of a simple coiled tube.

Horst describes as new (68):—

Megascolex indicus, *sumatranus*, *hassetti*, *sieboldi*, *japonicus*, *musicus*, *schmardæ*, *capensis*, *annulatus*.

He regards *Megascolex* as a synonym for *Perichæta*, but it is not so, and his species belong to the latter genus (*cf.* Beddard, Ann. N. H. 5, xiii. pp. 398–402).

Lankester [see Bourne, (56) p. 169] has rediscovered, in England, *Nais littoralis*, O. F. Müller.

The Recorder has not been able to see R. Jacobi's Inaug. Diss. on "Polydoren der Kieler Bucht," or F. Vejdovsky's Revision of the *Oligochæta* of Bohemia (*cf.* Zool. Anz. vii. pp. 215 & 233).

MYZOSTOMATA.

84. Graff, L. Verzeichniss der von den United States Coast-Survey-Steamers 'Hassler' und 'Blake' von 1867 zu 1879 gesammelten Myzostomiden. Bull. Mus. C. Z. xi. No. 7, pp. 125–192.

The species are arranged in groups, and the following new forms described:—*Myzostoma longipes*, *crenulatum*, *marginatum*, *gracilipes*, *lineata* [*tum*], *excisum*, *crenatum*, *agassizi*, *ventum*, *oblongum*, *caribbeanum*, *irregulare*, *rotundum*, *abundans*, *coriaceum*, *bicaudatum*, *filicauda*, *cysticolum*, *inflator*, *murrayi*. As most of the hosts are as yet undescribed, their names are not here reported.

ECHINODERMATA.

BY

F. JEFFREY BELL, M.A., SEC. R.M.S., F.Z.S.

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1. AGASSIZ, A. Selections from Embryological Monographs. II. *Echinodermata*. Mem. Mus. C. Z. ix. 2, 15 pls.

1A. ——. Reports on the Results of Dredging, &c. XXIV. pt. i. Report on the *Echini*. *Op. cit.* v. No. 1, 94 pp. 32 pls.

[Dated September, 1883; received in London, May, 1884.]

2. BELL, F. J. Observations on the Generic and Specific Characters of the *Laganidæ*. Ann. N. H. (5) xi. pp. 129–136.

3. ——. Studies on the *Holothuroidea*. II. Descriptions of New Species. P. Z. S. 1883, pp. 58–62. pl. xv.

4. ——. On the Spicules of *Cucumaria hyndmanni*, *C. calcigera*, and two allied forms. J. R. Micr. Soc. (2) iii. pp. 481–484, pl. viii.

5. ——. Report on the *Echinodermata* collected by Mr. F. Day in H.M.S. 'Triton' off the Eastern Coast of Scotland in July, 1882. J. L. S. xvii. pp. 102–104.

6. CARPENTER, P. H. On a New Crinoid from the Southern Sea. P. R. S. xxxv. pp. 138–140; Ann. N. H. (5) xii. pp. 143 & 144; Phil. Tr. clxxiv. pp. 919–933, pl. lxxi. [1884].

7. ——. On the Supposed Absence of Basals in the *Eugeniacrinidæ*, and in certain other Neocrinoids. Ann. N. H. (5) xi. p. 327–334.

8. ——. Note on *Democrinus parfaiti*. L. c. pp. 334–336.

9. ——. Notes on Echinoderm Morphology. No. vi. On the Anatomical Relations of the Vascular System. Q. J. Micr. Sci. xxiii. pp. 597–616.

10. HAMANN, O. Beiträge zur Histologie der Echinodermen. I. Die Holothurien (*Pedata*) und das Nervensystem der Asteriden. Z. wiss. Zool. xxxix. pp. 145–190, pls. x.–xii.

11. ——. Ditto. II. 1. Das Nervensystem der pedaten Holothurien (Fortsetzung). 2. Die Cuvierschen Organe. 3. Nervensystem und Sinnesorgane der Apedaten. *L. c.* pp. 309–333, pls. xx.–xxii.

12. Jourdan, E. Recherches sur l'histologie des Holothuries. Ann. Mus. Mars. i. No. 6, 64 pp., 5 pls.

13. Koehler, R. Recherches sur les Echinides des côtes de Provence. Ann. Mus. Mars. i. No. 3, 167 pp., 7 pls.

14. Loriol, P. de. Catalogue raisonné des Echinodermes recueillis par M. V. de Robillard à l'île Maurice. Mém. Soc. Phys. Genèv. xxviii. No. 8, 64 pp., 6 pls.

15. Ludwig, H. Verzeichniss der Holothurien des Kieler Museums. Ber. Oberh. Ges. xxii. pp. 155–176.

16. Lyman, T. Reports on the Results of Dredging, &c. xx. Report on the *Ophiuroidea*. Bull. Mus. C. Z. x. No. 6, pp. 227–287, pls. i.–viii.

17. Mackintosh, H. W. Report on the Acanthology of the *Desmosticha*. (Pts. ii. & iii.) Tr. R. Ir. Acad. xxviii. pp. 241–266, pls. v.–x.

18. Perrier, E. Sur un nouveau Crinoïde fixé, le *Democrinus parfaiti*, provenant des dragages du 'Travailleur.' C. R. xcvi. pp. 450–452, [Ann. N. H. (5) xi. pp. 223 & 224 : see Carpenter (8)].

19. ——. Sur des *Eudiocrinus* de l'Atlantique, et sur la nature de la faune des grandes profondeurs. *L. c.* pp. 725–728 [Ann. N. H. (5) xi. pp. 294–296].

20. ——. Echinodermes. Sur l'organisation des Crinoïdes. *Op. cit.* xcvii. pp. 187–189 [Ann. N. H. (5) xii. pp. 358–360].

21. Romanes, G. J. Observations on the Physiology of *Echinodermata*. J. L. S. xvii. pp. 131–137.

22. Selenka, E. Studien über Entwickelungsgeschichte der Thiere. II. Die Keimblätter der Echinodermen. Wiesbaden : 1883, 4to, pp. 28–61, pls. v.–x.

23. Semon, R. Das Nervensystem der Holothurien. Jen. Z. Nat. xvi. pp. 578–600, pls. xxv. & xxvi.

24. Sladen, W. P. The *Asteroidea* of H.M.S. 'Challenger' Expedition (Preliminary Notices). II. *Astropectinidæ*. J. L. S. xvii. pp. 214–269.

25. ——. Description of *Mimaster*, a new Genus of *Asteroidea* from the Faeroe Channel. Tr. R. Soc. Edinb. xxx. pp. 579–584, pl. xxxiv.

26. Stassano, E. Contribuzione alla fisiologia degli spermatozoidi. Zool. Anz. vi. pp. 393–395.

27. Studer, —. Uebersicht über die Ophiuriden, welche während der Reise S.M.S. 'Gazelle' um dre Erde 1874–76 gesammelt wurden. Abh. Ak. Berl. 1882, pp. 1–37, 3 pls.

28. Trautschold, H. Ueber die Bezeichnung des Kelchplatten der Crinoiden. Bull. Sci. Nat. Mosc. 1882 [1883] pp. 201–203.

Geographical Distribution.

List of deep-sea Echinoderms; Norman, Tr. North. Durh. viii. pp. 127–129.

On deep-sea Echinoderms of Atlantic and Mediterranean, see Perrier in A.-Milne Edwards's "Rapport, &c.," Arch. Miss. sci. (3) ix. [1882] 63 pp., 2 maps; pp. 24, 25, & 50–53.

On Echinoderms of the Cape Verde Islands, see De Rochebrune, N. Arch. Mus. (2) iv. pp. 321–329.

For an interesting account of the *Echinodermata* of the Mediterranean, see Marion, "Esquisse d'une topographie zoologique du Golfe de Marseille," and "Considérations sur les faunes profondes de la Mediterranée"; Ann. Mus. Marseille, i. pts. 1 & 2.

Echinoderms of the North Sea; Bell (5).

The origin of the Echinid fauna of the West Indies is discussed by Agassiz (1A).

Asteroidea of Färoe Channel; Sladen, Tr. R. Soc. Edinb. xxxii. p. 153.

Contributions to the International Fisheries Exhibition, London, 1883.

See the Official Catalogue.

United States of America. Cat. B. Economic Echinoderms exhibited, p. 26 (by R. Rathbun). Washington: 1883. Notes on edible forms, p. 17.

China. "Starfish" of Swatow, p. 31; of Takow, pp. 65 & 66, of Special Catalogue. Shanghai: 1883.

India. Page 153 (Madras) of Catalogue of the Exhibits in the Indian Section, by F. Day; p. 175 (Sind).

New South Wales. Page 38 of Catalogue of, &c., in N. S. W. Court, by E. P. Ramsay. London: 1883.

Sweden. Nordenskiöld's Arctic Echinoderms, p. 95. Dickson's Collection, pp. 97 & 98 (see also Special Catalogue of Dickson's Collection from the Gothenburg Museum, pp. 14 & 15), in Special Catalogue "Sweden." Stockholm: 1883.

General Morphology of the Group.

Carpenter (9) has published another part of his "Notes on Echinoderm Morphology," in which he discusses the views of certain French anatomists as to the anatomical relations of the vascular system. The results of Koehler are found to disagree with those of Perrier and Apostolidès, but to agree rather with those of Ludwig and Carpenter in the assertion of a connection between the so-called heart and the blood-vascular system. Carpenter has discovered bipolar cells in the axial cord of *Pentacrinus*, *Bathycrinus*, and *Antedon eschrichti*; the last is a more satisfactory subject for anatomical investigation than is *A. rosacea*, on which Perrier's studies have been based.

Carpenter (7) believes that basals are not absent from certain Neocrinoids, as some observers have supposed.

On the apical area of Echinoids, see Agassiz (1A).

Perrier (20) thinks that the so-called heart is glandular in nature, and proposes to call it the ovoid gland; he recognizes the nervous nature of the chambered organ, on which the Carpenters have insisted, an opinion to which no continental naturalist has yet publicly recorded his adhesion.

Romanes (21) adduces evidence which he believes to prove the existence of an olfactory sense in Starfishes.

Selenka (22) describes the phenomena of cleavage and the characters of the mesenchym in *Synapta digitata*, Echinids, and Ophiurids, the mesoderm, nervous system, and mouth and anus of *Cucumaria planci*. Differences in the mode of cleavage are not to be regarded as having any phylogenetic value. The mesoblast arises from two primitive cells of the mesenchym, and from diverticula of the archenteron. Their developmental history points to the origin of Echinoderms from worm-like ancestors.

In his studies on the histology of the *Echinodermata*, Hamann (10, 11) has chiefly investigated Holothurians; some observations are also made on the nervous system of Asterids. While the former have the connective tissue well developed and the tegumentary epithelium thin, the reverse of these conditions is found in the latter. The nervous system of Starfishes calls to mind that of the *Cœlenterata*, and the simplest type of optic organ in any group of the Animal Kingdom is found in them.

Semon (23) has investigated the microscopic as well as the macroscopic characters of the nervous system of Holothurians; the latter are especially difficult of investigation, and care must be taken as to the methods employed.

Mackintosh (17) has investigated the minute structure of the spines of *Arbaciidæ*, and of some *Echinometridæ* and *Echinidæ*, and makes some corrections and additions to his earlier notices of the *Diadematidæ* and *Echinothuriidæ*.

ECHINOIDEA.

Among others, de Loriol (14) has notes on—

Rhabdocidaris gigantea, imperialis, dubia.

Echinothrix desori.

Echinus versiculatus, Lütken, is not a synonym of *Echinus angulosus*.

Echinus robillardi, sp. n.

Pseudoboletia indiana and *P. maculata* have been confused by Bell [who, Ann. N. H. (5) xiii. p. 108, accepts the statement, but points out how and why he followed A. Agassiz].

Echinostrephus molaris.

Stomopneustes variolaris.

Echinoneus cyclostomus, E. abnormalis, sp. n.

Maretia alta.

Bell (2) disputes the validity of the characters by which *Peronella* has been distinguished from *Laganum*, and points out that the extent of the development of the partitions appears to depend on growth and age.

On the differences between *Rotula rumphi* and *R. dentata*, see de Rochebrune, N. Arch. Mus. (2) iv. p. 328.

The Eocene Echinoids of Egypt in the Libyan Desert are described by de Loriol ; Palæontogr. xxx. (2) 59 pp., 11 pls.

P. de Loriol (*op. cit.* & 14) proposes to use Desor's name of *Rhabdocidaris* for the species of—1. *Rhabdocidaris* (S. Str.) ; 2. *Rhabdocidaris* with non-crenulated primary tubercles; 3. *Liocidaris* (emend.); 4. *Phyllacanthus* of A. Agassiz (which is not the same as *Phyllacanthus* of Brandt) ; 5. *Stephanocidaris*, A. Ag. ; 6. *Schleinitzia*, Studer.

Cotteau (Bull. Soc. Z. Fr. viii. pp. 450–464) describes some new fossil Echinids. New genera, *Asteropsis* [name preoccupied in *Asteroidea*], *Coptechinus* (Miocene).

Duncan & Sladen (Pal. Ind., ser. xiv. pp. 91, pl. xiii.) describe as a new genus *Troschelia*, allied to *Breynia* ; they also describe a number of new species, many of which are Echinolampads.

Jurassic Echinids of Algeria; Cotteau, Bull. Soc. Géol. xi. pp. 449–451.

Hybochinus, g. n. (carboniferous), Worthen & Miller, Geol. Surv. Illin. vii. p. 331.

ASTEROIDEA.

Brisingaster, g. n., for *B. robillardi*, sp. n. ; between *Brisinga* and *Labidiaster*. De Loriol, (14) p. 55.

For a full description of *Mimaster tizardi*, see Sladen (25).

Koren & Danielssen (N. Mag. Naturv. xxviii. ; see Ann. N. H. 5, xi. pp. 384–388) describe as new :—

Asterias normani.

Echinaster scrobiculatus.

Ilyaster mirabilis. This new generic form may be only an immature specimen ; it has a central dorsal appendage, strongly reminding one of a peduncle.

Perrier describes as new :—

Asterias richardi and

Astrella simplex, from great depths of the Mediterranean (Milne-Edwards, Rapport [*Verm.* p. 2], pp. 24 & 25).

Pedicellaster margaritaceus, sexradiatus ;

Corethraster setosus ;

Marginaster pentagonus ;

Pentagonaster (*Dorigona*) *jacqueti* ;

Hoplaster spinosus ;

Goniopecten edwardsi ; from great depths of the Atlantic (*op. cit.* pp. 50–52).

Studer (SB. nat. Fr. 1883, p. 128) mentions but does not describe

Asterias belli, sp. n., from the coast of Patagonia.

Asterias nautarum, sp. n., Bell, Ann. N. H. (5) xii. p. 333.

Culcita acutispinosa, sp. n., *id. l. c.* p. 334.

Studer (*l. c.* p. 120) briefly describes *Cheiraster*, g. n., allied to *Archaster*, for *C. gazella*, sp. n., and (p. 131) *Luidiaster*, g. n. of Astropectinids.

He fully describes *Zoroaster fulgens*, Wyv.-Thoms.

Sladen (Tr. R. Soc. Edinb. xxxii. p. 153) describes as new :—

Pteraster militaris var. *prolata.*

Rhegaster, g. n. (Asterinid), for *Solaster tumidus*, D. & K., and *R. murrayi*, sp. n.

On *Astropecten muelleri*, see Marion, Ann. Mus. Mars. i. No. 2, p. 24.

Sladen (24) divides the *Astropectinidæ* into two subfamilies—

1. *Porcellanasteridæ*, in which he describes,

Porcellanaster cæruleus, Wy.-T., *caulifer*, *tuberosus*, *crassus*, and *gracilis*, spp. nn.

Styracaster, g. n., for *S. horridus*, *armatus*, spp. nn.

Hyphalaster, g. n., for *H. hyalinus*, *diadematus*, *inermis*, *planus*, spp. nn.

Thoracaster, g. n., for *T. cylindratus.*

2. *Astropectinidæ*, of which

Astropecten brevispinus, *pectinatus*, *acanthifer*, *imbellis*, *hermatophilus*, *pontoporæus*, *zebra*, *zebra* var. *rosea*, *monacanthus*, *cingulatus*, *mesactus*, are spp. nn.

Compsaster and *Colaster* (carboniferous), gg. nn., Worthen & Miller, Geol. Surv. Illin. vii. pp. 327 & 328.

OPHIUROIDEA.

Lyman (16) describes as new :—

Pectinura tessellata, *lacertosa*, *angulata.*

Ophiozona marmorea, *clypeata.*

Ophiernus adspersus.

Ophioglypha fasciculata, *abyssorum*, *scutata*, *tenera.*

Ophiocten pattersoni.

Ophiomastus texturatus.

Amphiura incisa, *nereis.*

Ophiochytra tenuis.

Ophiochiton ternispinus.

Ophiacantha bairdi, *bartletti*, *cervicornis*, *lineolata*, *lævipellis*, *scolopendrica.*

Ophiomitra incisa.

Ophiocamax fasciculata.

Ophiocopa, g. n., for *O. spatula.*

Ophiotoma, g. n., for *O. coriacea.*

Ophiosciasma granulatum.

Ophiogeron supinus.

Ophiobyrsa perrieri, *serpens*, *hystricis.*

Ophiomyxa tumida, *serpentaria.*

Ophiochondrus crassispinus, *squamosus.*

Hemieuryale tuberculosa.

Ophiobrachion, g. n. Distinguished by hooklets replacing the arm-spines quite to the base of the arm—a feature found in no other Ophiuran. The genus is allied to *Ophiomyxa* and *Ophiobyrsa*, and stands nearest to the simple-armed *Astrophyton.* For *O. uncinatus.*

Ophiocreas spinulosus.

There are also notes on the characters of—
Ophioglypha falcifera, variabilis, irrorata (?), *convexa* (?).
Ophiomusium eburneum (original specimen was only half-grown) and *O. lymani.*
Ophiophyllum petilum (?).
Amphiura sp. n. (?), *verrilli* (?), *tomentosa* (?), *angularis.*
Ophiacantha scutata, echinulata, pentacrinus, stellata.
Ophioscolex tropicus, glacialis.
Ophiocreas œdipus (?).

Studer (27) describes as new :—
Pectinura semicincta, Cape Verde.
Ophiolepis affinis, West Africa.
Ophiopyrgus saccharatus, Fiji, 970 fath.
Ophioglypha stellata, West Australia, Amboyna.
Amphiura modesta, New Zealand, *A congensis*, Mouth of Congo.
Ophiochiton lymani, 35° 26′ S. lat., 79° 42′ E. long.; 40° 13′ S. lat., 78° 26′ E. long.
Ophiothamnus gracilis, W. Australia.
Ophiothrix petersi, 10° 6′ N. lat., 17° 6′ W. long., *O. smaragdina*, N.W. Australia.
Ophioscolex prolifer, East of New Zealand.
He has notes also on some of the other, in all 58, species here reported upon.
Trematuster, g. n. (carboniferous), Worthen & Miller, Geol. Surv. Illin. vii. p. 330.

HOLOTHUROIDEA.

Evidence against Holothurians eating coral; Nature, xxvii. pp. 7, 433 & 508.
Ludwig (15) describes as new :—
Thyone spectabilis, Strait of Magellan.
Holothuria marenzelleri, Nankauri, *H. mœbii*, Hongkong, *H. magellani*, Straits of Magellan.
He makes many important corrections of Haacke's names and "new species" [*cf.* Zool. Rec. xviii. *Ech.* p. 8] in Möbius's collection from Mauritius.
On the spicules of *Cucumaria*; Bell (4).
Bell (3) describes as new :—
Caudina meridionalis, New Zealand.
Ocnus vicarius, Antarctic Sea (?).
Thyone meridionalis, cunninghami, Straits of Magellan.
Phyllophorus dobsoni, Bay of Honduras.
Stereoderma murrayi, Kurrachee.
Stichopus assimilis, Angola.

CRINOIDEA.

Carpenter (6) describes *Thaumatocrinus renovatus*, g. & sp. nn., from 1800 fath. depth. It is remarkable for—(1) The presence of a closed ring of basals on the exterior of the calyx. (2) The persistence of the oral plates of the larva, as in *Hyocrinus* and *Rhizocrinus*. (3) The separation of the primary radials by interradials which rest on the basals. (4) The presence of an arm-like appendage on the interradial plate of the anal side. The deep significance of these characters is clearly pointed out.

Perrier (18) describes *Democrinus parfaiti*, g. & sp. nn., but Carpenter (8) thinks it is the same as *Rhizocrinus rawsoni*.

Eudiocrinus atlanticus, sp. n., Perrier (19).

On *Apiocrinus*, cf. De Loriol, CR. Ass. Fr. Sci. 1882, pp. 334–338.

Arthroacantha ithacensis, g. & sp. nn. A Devonian Crinoid with moveable spines. H. S. Williams, P. Am. Phil. Soc. xxi. pp. 81–83, 1 pl.

Adult of *Eucrinus gracilis*; Kunisch, Z. geol. Ges. 1883, pp. 195–198, pl. viii.

Eucrinus beyrichi, sp. n., Picard, *tom. cit.* pp. 199–202, pl. ix.

Remarks on *Glyptocrinus* and *Reteocrinus*, two genera of Silurian Crinoids; Am. J. Sci. xxv. pp. 255–268.

Glyptocrinus redefined and restricted, *Gaurocrinus*, *Pycnocrinus*, and *Campsocrinus* established, and two new species described; S. A. Miller, J. Cincinn. Soc. vii. pp. 217–234.

Palæocrinoidea of Illinois; Worthen & Miller, Geol. Surv. Illin. vi. pp. 269–317.

Echinodiscus, g. n. of *Agelacrinoidea* [name preoccupied]; *iid. l. c.* p. 335.

Etheridge & Carpenter make some further remarks on the morphology of the *Blastoidea*; Ann. N. H. (5) x. pp. 225–246.

On the characters of the *Blastoidea*, and observations on the structure of the basal plates in *Codaster* and *Pentremites*; Worthen, Geol. Surv. Illin. vii. pp. 346–357.

CŒLENTERATA.

HYDROZOA AND CTENOPHORA, BY ALFRED GIBBS BOURNE, B.Sc. (LOND.), &c.

ANTHOZOA, BY SYDNEY J. HICKSON, D.Sc. (LOND.), B.A., &c.

HYDROZOA AND CTENOPHORA.

1. AGASSIZ, A. Exploration of the Surface Fauna of the Gulf Stream under the auspices of the Coast Survey. III. Pt. i. The *Porpitidæ* and *Velellidæ*. Mem. Mus. C. Z. viii. No. 2.

2. ALLMAN, G. J. Report on the *Hydroida* dredged by H.M.S. 'Challenger' during the years 1873–76. Pt. i. *Plumularüidæ*. Rep. Sci. Res. 'Challenger,' Zool. vii., with 20 pls.

The collection of Hydroids brought home by the 'Challenger' makes a large and valuable addition to the number of species hitherto known. Of this collection, the family of the *Plumularüidæ* forms a considerable proportion. Among these, 4 species, namely, *Acanthella effusa*, *Acanthocladium huxleyi*, *Aglaophenia macgillivrayi*, and *Lytocarpus longicornis*, have been described by Busk from the 'Rattlesnake' collection, and 1, namely, *Lytocarpus secundus*, by Kirchenpauer, from specimens brought home by Semper from the Pelew Islands. The 'Challenger' also obtained from dredgings off the Bermudas a species (*Aglaophenia ramosa*) already described in the Report on the *Hydroida* of the United States' Exploration of the Gulf Stream. The only form which can be identified with a species occurring in the European Seas is *Cladocarpus formosus*; this was dredged by the 'Porcupine' from the Seas lying to the North of Scotland, and by the 'Challenger' from the Seas of Japan. But by far the greater part of the *Plumularüidæ* brought home by the 'Challenger' consists of species new to science; while among these, a considerable number must be assigned to genera now specially constituted for their reception. The author founds the following classification of the group:—

PLUMULARIIDÆ.

- Moveable nematophores always present. — ELEUTHEROPLEA.
  - Gonangia with special protective apparatus. — *Eleutheroplea.* / *Phylactocarpa.*
  - Gonangia destitute of special protective apparatus. — *Eleutheroplea.* / *Gymnocarpa.*
- Moveable nematophores never present. — STATOPLEA.
  - Gonangia with special protective apparatus. — *Statoplea.* / *Phylactocarpa.*
  - Gonangia destitute of special protective apparatus. — *Statoplea.* / *Gymnocarpa.*

3. Ammon, L. von. Ueber neue Exemplare von jurassichen Medusen. Abh. Bayer. Ak. (2) xv. (Also separately, München: 1883, 4to, 66 pp.)

4. Blanchard, R. Note sur la matière colorante bleue du Rhizostome de Cuvier. Bull. Soc. Zool. vii. pp. 402–404. (See also Zool. Anz. vi. pp. 67–69.)

The author differs from Krukenberg with regard to the existence of cyanein.

5. Böhm, R. Ueber eine Qualle im Tanganjika-See, mit Bemerkungen von E. von Martens. SB. nat. Fr. 1883, pp. 197–200.

6. Bourne, A. G. Recent Researches upon the Origin of Sexual Cells in Hydroids. A Review. Q. J. Micr. Sci. xxiii. pp. 617–622.

7. Brandt, Karl. Die Fortpflanzung der grünen Körper von *Hydra*. Zool. Anz. vi. pp. 367–370.

The author opposes Hamann's view [*infrà* (21)].

8. Brooks, W. K. On the Alternation of Generations in *Hydromedusæ*. J. Hopkins Univ. Circ. ii. p. 73 *et seq.* See also Ann. N. H. (5) xi. pp. 458 & 459.

9. ——. Notes on the *Medusæ* of Beaufort, N.C. Pt. ii. Stud. Biol. Lab. J. Hopkins Univ. ii. pp. 465–475.

10. Chun, C. Ueber die cyklische Entwickelung und die Verwandtschaftsverhältnisse der Siphonophoren. SB. Ak. Berlin, 1882, pp. 1155–1172, pl., and Ann. N. H. (5) xi. pp. 153–169.

The species investigated (*Monophyes primordialis*, sp. n.) presents five stages in its life-history, some of which have been described as separate species:—(1) The planula stage; (2) Embryo commencing to bud calyx and tentacle; (3) *Monophyes primordialis*; (4) *Muggiæa kochi*; (5) *Eudoxia eschscholtzi*.

11. Claus, C. Ueber das Verhältniss von *Monophyes* zu den Diphyiden, so wie über den phylogenetischen Entwickelungsgang der Siphonophoren. Arb. z. Inst. Wien, v. pp. 15–28. (Also separately, Wien: 1883.)

12. ——. Die Ephyren von *Cotylorhiza* und *Rhizostoma*, und ihre Entwickelung zu achtarmige Medusen. *L. c.* pp. 169–178. (Also separately, Wien: 1883.)

The author has been able to trace all the stages of the development of the *Ephyræ*.

13. ——. Untersuchungen über die Organisation und Entwickelung der Medusen. Prag & Leipzig: 1883, 4to.

14. ——. Zur Phylogenie der Siphonophoren. Kosmos, xiii. pp. 692–694.

15. Cope, E. D. [New Hydroid Polyp, *Rhizohydra flavitincta*, from the Upper Klamath Lake.] P. Ac. Philad. (2).

A fresh-water Hydroid possessing a cœnœcium.

16. Fewkes, J. W. The Affinities of *Tetraplatia volitans*. Am. Nat. xvii. p. 426.

17. ——. The Embryonic Tentacular Knobs of certain Physophores. *L. c.* pp. 667 & 668.

18. ——. The Siphonophores. v. The *Diphyæ*. L. c. pp. 833–845.

19. ——. On a few *Medusæ* from the Bermudas. Bull. Mus. C. Z. xi. pp. 79–90.

20. Hamann, O. Beiträge zur Kenntniss der Medusen. Z. wiss. Zool. xxxviii. pp. 419–429.

21. ——. Die Fortpflanzung der grünen Körper von *Hydra*. Zool. Anz. vi. pp. 367–370.

22. Hamilton, A. A Fresh-water Hydrozoon (*Cordylophora lacustris*?). N. Z. J. Sci. i. pp. 419 & 420.

23. Haug, Emil. Ueber sogenannte *Chatetes* aus Mesozoischen Ablagerungen. JB. Mineral, 1883, pp. 171–179, pl. x.

24. Herrmann, Otto. Vorläufige Mittheilung über eine neue Graptolithenart und mehrere bisher noch nicht aus Norwegen gekannte Graptolithen. N. Mag. Naturv. xxvii. pp. 341–358, 2 pls.

25. Jennings, T. B. Curious Process of Division of *Hydra*. Am. Micr. J. iv. p. 64.

26. Jickeli, C. F. Der Bau der Hydroidpolypen. II. Ueber den histiologischen Bau von *Tubularia*, L., *Cordylophora*, Allm., *Cladonema*, Duj., *Coryne*, Gärtn., *Gemmaria*, M'Crady, *Perigonimus*, Sars, *Podocoryne*, Sars, *Camponopsis*, Claus, *Lafoea*, Lam., *Campanularia*, Lam., *Obelia*, Pér., *Anisocola*, Kirchenp., *Isocola*, Kirchenp., *Kirchenpaueria*, Jick. Morph. JB. viii. pp. 580–680, pls. xxv.–xxviii.

The author describes 2 new species, *Coryne græffii* and *Perigonimus steinachi*, and a new genus, *Kirchenpaueria*, sp.?

27. Keller, C. Ueber Medusen des Rothen Meeres. Viert. Ges. Zürich, xxviii. pp. 85 & 86.

28. ——. Untersuchungen über neue Medusen aus dem Rothen Meere. Z. wiss. Zool. xxxviii. pp. 621–670.

For *Gastroblasta timida*, g. & sp. nn., the author forms a new family, the *Gastroblastidæ*, allied to the *Petasidæ*. *Cassiopea polypoides*, another new species, is described.

29. Korotneff, A. Zur Kenntniss der Embryologie von *Hydra*. Z. wiss. Zool. xxxviii. pp. 314–322; see Ann. N. H. (5) xi. pp. 428–435.

30. ——. Zur Kenntniss der Siphonophoren. Zool. Anz. vi. pp. 492–496.

31. Krukenberg, C. F. W. Antwort auf Herrn Dr. Blanchard's Notiz über das Cyanein. Zool. Anz. vi. pp. 215 & 216.

32. Lendenfeld, R. von. Ueber Cœlenteraten der Südsee. III. Mittheilungen über Wehrpolypen und Nesselzellen. Z. wiss. Zool. xxxviii. pp. 351–371, pl.

33. [Lendenfeld, R. von]. Ueber Cœlenteraten der Südsee. iv. Mittheil. *Eucopella campanularia*, g. & sp. nn. *L. c.* pp. 497–583.

34. ——. On Guard Polyps and Urticating Cells. Ann. N. H. (5) xii. pp. 250–264.

35. ——. Ueber eine eigenthümliche Art der Sprossenbildung bei Campanulariden. Zool. Anz. vi. pp. 42–44.

36. ——. Ueber das Nervensystem der Hydroidpolypen. *L. c.* pp. 69–71.

37. ——. Eine ephemere Eucopide (*Eucopella campanularia*, g. & sp. nn.). *L. c.* pp. 186–189.

This is a small and ephemeral form which is in many ways very interesting. Nutrition is only effected in the Hydroid condition.

38. Macé, E. De la recherche et de la détermination des Polypes Hydraires. Morlaix: 1883, 8vo, 38 pp.; extr. from Bull. Soc. Finistère, v.

39. Mereschkowsky, C. de. Histoire du développement de la Méduse *Obelia*. Bull. Soc. Zool. viii. pp. 98–129.

40. Moseley, H. N. Aug. Weismann on the Sexual Cells of the *Hydromedusæ*. Nature, xxix. pp. 114–118.

41. Müller, Fr. *Drymonema* an der Küste von Brasilien. Zool. Anz. vi. pp. 220–222.

42. Pieper, A. Zwei neue Arten zum Genus *Plumulariidæ* gehörender Hydroid-polypen. JB. westf. Ver. 1879 [1880] pp. 142–145.

43. ——. *Antennularia cruciata*, eine neue Hydroide aus der Adria. *Op. cit.* 1880 [1881] pp. 40–43.

44. Quelch, J. J. On *Thuiaria zelandica*, Gray. Ann. N. H. (5) xi. pp. 247–249.

45. Storm, V. Bidrag til kundskab om Throndhjemsfjordens Fauna. iv. Om de i Fjorden forekomne hydroide Zoophytes. Nor. Selsk. Skr. 1881, pp. 1–30.

46. Weismann, A. Die Entstehung der Sexualzellen bei den Hydromedusen. Zugleich als Beitrag zur Kenntnis des Baues und der Lebenserscheinungen dieser Gruppe. Jena: 1883, Text and Atlas, 4to.

47. Young, J. On Ure's Millepore, *Tabulipora* (*Cellepora*) *urii*, Flem. Ann. N. H. (5) xii. pp. 154–158.

48. Zeller, G. Algen und Zoophyten im nordischen Meer und Sibirien, gesammelt von Graf Waldburg-Zeil. JH. Ver. Württ. xxxix. pp. 104–106.

New genera and species:—

Sub-Class HYDROMEDUSÆ.

Order i., Gymnoblastea-Anthomedusæ.

Rhizohydra flavitincta, g. & sp. nn., Cope, (15), Upper Klamath Lake.
Coryne graffii, sp. n., Jickeli, (26) p. 607, pl. xxviii. fig. 4, Trieste.

Perigonimus steinachi, sp. n., Jickeli, (26) p. 617, pl. xxvii. figs. 1–9, Trieste.

Oceanopsis, g. n., Fewkes, (19) p. 86. Differs from all other members of the *Oceanidæ* in possessing four otocysts, from the neighbourhood of each of which, on the bell-margin, there arise small tentacular filaments. For *O. bermudensis*, sp. n., *ibid.* pl. i. figs. 8–10, Bermudas.

Order ii., Calyptoblastea-Leptomedusæ.

Aglaophenia parva, sp. n., Pieper, (42).

Antennularia pentasticha, sp. n., Pieper, (42).

Antennularia cruciata, sp. n., Pieper, (43).

Kirchenpaueria, g. n., Jickeli, (26) p. 645, pl. xxviii. figs. 25–28, Trieste.

Eucopella, g. n., Lendenfeld, (37) p. 497; for *E. campanularia*, sp. n., Lendenfeld, (37) p. 497, pls. xxvii.–xxxii., Brighton, near Melbourne, Australia.

Plumularia flabellum, sp. n., Allman, (2) p. 19, pl. i. figs. 1–4, Marion Island, 50–75 fath.; *P. laxa*, sp. n., Allman, (2) p. 19, pl. i. figs. 5 & 6, 'Challenger' Station 163, lat. 36° 56′ S., long. 150° 30′ E., 120 fath.; *P. dolicotheca*, sp. n., Allman, (2) p. 20, pl. i. figs. 7 & 8, Tamboanga, Philippines, 10 fath.; *P. insignis*, sp. n., Allman, (2) p. 21, pl. ii., 'Challenger' Station 145, lat. 46° 40′ S., long. 37° 50′ E., depth 310 and 150 fath.; *P. abietina*, sp. n., Allman, (2) p. 21, pl. iii., Prince Edward's Island, 150 fath.; *P. stylifera*, sp. n., Allman, (2) p. 22, pl. iv. figs. 1 & 2, Nightingale Island, Tristan d'Acunha, Station 135, 100–150 fath.; *P. armata*, sp. n., Allman, (2) p. 22, pl. iv. figs. 3 & 4, Port Jackson, Station 163A, 30–35 fath., bottom red clay.

Antennularia fascicularis, sp. n., Allman, (2) p. 24, pl. iv. figs. 5 & 6, Nightingale Island, Tristan d'Acunha, 100–150 fath.

Sciurella, g. n., Allman, (2) p. 25. Trophosome: Hydrocladia not disposed in pinnæ, but springing from many points round the circumference of chord-like stems. Gonosome: Gonangia situated in the axils of the hydrocladia, provided with symmetrically disposed horn-like processes, and enclosing a ramified blastostyle, whose branches are in connection with moveable nematophores distributed over the surface of the gonangium. For *S. indivisa*, sp. n., Allman, (2) p. 26, pl. v., Somerset Island, Cape York, Torres Strait, 5–10 fath.

Acanthella, g. n., Allman, (2) p. 27. Trophosome: Hydrocladia pinnately disposed; hydrocladia-bearing branches terminating in simple-jointed prolongations, in which the places of the hydrocladia are taken by spine-like appendages. Gonosome unknown. For *A. effusa* (Busk), pl. iv., Cape York, Torres Strait, Zamboanga, 10 fath.

Schizotricha, g. n., Allman, (2) p. 28. Trophosome: Hydrocladia pinnately disposed, once, twice, or oftener bifurcating. Gonosome: Gonangia springing from the hydrocladia. For *S. unifurcata*, sp. n., Allman, (2) p. 28, pl. vii. figs. 1–3, Christmas Harbour, Kerguelen, 100 fath. *S. multifurcata*, sp. n., Allman, (2) p. 29, pl. vii. figs. 4 & 5, Heard Island, Station 151, 75 fath., bottom mud.

Polyplumaria plumila, sp. n., Allman, (2) p. 31, pl. iv. figs. 7 & 8, 'Challenger' Station 75, lat. 38° 37′ N., long. 28° 30′ W., 450 fath., bottom sand.

Heteroplon, g. n., Allman, (2) p. 31. Trophosome: Hydrocladia pinnate; hydrothecal internode, with the lateral nematophores moveable, and with a mesial fixed spine-like nematophore below the hydrotheca. Gonosome not known. For *H. pluma*, sp. n., Allman, (2) p. 32, pl. viii. figs. 1–3, 'Challenger' Station 162, East Moncœur Island, Bass's Strait, 38–40 fath., bottom sandy.

Acanthocladinum, g. n., Allman, (2) p. 32. Trophosome: Distal portion of branches destitute of hydrocladia, whose places are taken by a long spine-like appendage on each internode. Gonosome: Phylactocarp replacing a hydrocladium, and consisting of a rhachis with two series of pinnately-disposed, alternate, free ribs, each rib carrying near its base a hydrotheca. Gonangia springing from the rhachis. For *A. huxleyi* (Busk), 'Challenger' Station 188, lat. 9° 59′ S., long. 139° 42′ E., 28 fath., bottom mud; also Station 190, lat. 8° 56′ S., long. 136° 5′ E., depth 49 fath., bottom temperature 23° 9 C., bottom mud.

Aglaophenia filicula, sp. n., Allman, (2) p. 36, pl. xi. figs. 1–6, 'Challenger' Station 75, lat. 38° 37′ N., long. 28° 20′ W., depth, 450 fath., bottom sandy; *A. attenuata*, sp. n., Allman, (2) p. 37, pl. xi. figs. 7–9, Simon's Bay, Cape of Good Hope, depth 10–20 fath.; *A. acacia*, sp. n., Allman, (2) p. 38, pl. xii. figs. 1–4, Station 75, lat. 38° 37′ N., long. 28° 30′ W., depth 450 fath., bottom sandy; *A. calamus*, sp. n., Allman, (2) p. 39, pl. xii. figs. 5–8, Bahia, 10–20 fath.; *A. coarctica*, sp. n., Allman, (2) p. 30, pl. xix. figs. 7–9, Zamboanga, Philippines, 10 fath.

Lytocarpus racemiferus, sp. n., Allman, (2) p. 41, pl. xiii., Bahia, 10–20 fath.; *L. spectabilis*, sp. n., Allman, (2) p. 43, pl. xv., Zamboanga, Philippines, 10 fath., Torres Strait, lat. 10° 30′ S., long. 142° 18′ E., 8 fath., bottom, coral, sandy.

Streptocaulus, g. n., Allman, (2) p. 48. Trophosome: Hydrocladia disposed in a continuous spiral round the stem; hydrotheca with entire margin; mesial nematophore not adnate to the walls of the hydrotheca. Gonosome not known. For *S. pulcherrimus*, sp. n., Allman, (2) p. 48, pl. xvi. figs. 1–3, Porto Praya, St. Jago, 100 fath.

Diplocheilus, g. n., Allman, (2) p. 48. Trophosome: Hydrotheca with a duplicature of its walls forming an external calycine envelope, which surrounds the hydrotheca for some distance behind its orifice. Mesial nematophore in the form of a shield-like process not adnate to the hydrotheca; lateral nematophores absent. Gonosome not known. For *D. mirabilis*, sp. n., Allman, (2) p. 49, pl. viii. figs. 4–7, Station 162, Moncœur Island, Bass's Strait, depth 38–40 fath., bottom sandy.

Cladocarpus pectiniferus, sp. n., Allman, (2) p. 50, pl. xvii., Station 76, lat. 36° 11′ N., long. 27° 9′ W., depth 900 fath., bottom temperature 4° 2 C., bottom, *Globigerina*-ooze.

Halicornaria plumosa, sp. n., Allman, (2) p. 52, pl. xviii., Station 122, Barra Grande, Brazil, depth 32 fath.

Azygoplon, g. n., Allman, (2) p. 53. Trophosome: Hydrocladia pinnately disposed. Mesial nematophore adnate to the walls of the hydro-

theca; no lateral nematophores. For *A. rostratum*, sp. n., Allman, (2) p. 54, pl. xix. figs. 1–3, Port Phillip, depth 38 fath., bottom sandy.

Order iii., Trachomedusæ.

Gastroblasta, g. n., Keller, (28) p. 622. For *G. timida*, sp. n., *id. ibid.* pl. xxxv. figs. 1 & 2, Red Sea.

Order vi., Siphonophora.

Monophyes primordialis, sp. n., Chun, (10) pl. xvii., Malaga.

GRAPTOLITES.

Loganograptus kjerulfi, sp. n., Otto Herrmann, (24).

Sub-Class SCYPHOMEDUSÆ.

Order iii., Cubomedusæ.

Tamoya punctata, sp. n., Fewkes, (19) p. 84, pl. i. figs. 4–6.

Order iv., Discomedusæ.

Cassiopea polypoides, sp. n., Keller, (28) p. 632, pl. xxxvi. fig. 6, Red Sea, five varieties described.

Drymonema gorgo, sp. n., Fritz Müller, (41) p. 220, Brazil.

ANTHOZOA.

1. Boutillier, L. Des Corallaires à Madrépores, et de leur action géologique. Rouen : 1883.

[Not seen by Recorder.]

2. Canestrini, G. Il Corallo. Roma : 1883, pp. 170, map.

[Not seen by Recorder.]

3. Crosby, W. O. On the Elevated Coral Reefs of Cuba. P. Bost. Soc. xxii. pp. 124–128 (not concluded). Abstr. in J. R. Micr. Soc. (2) iii. p. 854.

The author describes the coral reefs of Cuba, and draws the conclusion that they indicate a slow subsidence during their formation, and hence that Darwin's theory of the formation of coral reefs is the true one.

4. Duncan, P. M. Remarks on an Essay by Prof. Lindstrom, entitled "Contributions to the Actinology of the Atlantic Ocean," &c. Ann. N. H. (5) xii. pp. 361–369.

Paluli are present in *Caryophyllia pourtalesi*, and therefore the synonym proposed for it by Lindstrom is useless. Paluli are also

present, as proved by an examination of Pourtales' specimen, in *Leptocyathus stimpsoni*. *Haplophyllia*, *Duncania*, and *Gwynia* are not rugose. *Paracyathus arcuatus* (Lind.) = *Asterosmilia prolifera* (Pourt.).

5. [Duncan, P. M.]. On the Madreporarian Genus *Phymastræa* of Milne-Edwards & Haime, with a description of a new species. Y. J. S. 1883, pp. 406–412, 2 woodcuts.

The genus *Phymastræa* must be left between *Heliastræa* and the genera with entirely soldered or united walls. The genus really stands alone in its characteristic method of corallite union.

6. ——. Observations on the Madreporarian Family, the *Fungidæ*, with special reference to the hard structures. J. L. S. xvii. pp. 137–162 & 302–318, pls. v., vi., & xiii. Abstr. in J. R. Micr. Soc. (2) iii. pp. 666 & 854.

The first part of this paper contains remarks on the distribution of the septa, the columella, the interlocular spaces, and the histology of the hard parts of the family *Fungiidæ*. There is also an account of the construction of the corallum of *Fungia echinata*, the arrangement of the hard parts of the genus *Herpetolitha*, and the construction of *Halomitra crustacea*. These prove to be very typical genera of the *Fungiidæ*. The second part deals with the subfamily *Lophoserinæ*, and the examples chosen to illustrate it have a palæontological bearing. The genus *Lophoseris* is taken as a typical example; then the genus *Mæandroseris*, with collines limiting the calices, is considered; *Pachyseris* follows as a most abnormal form, the collines being in excess; and *Coscinarea*, *Siderastræa*, *Echinopora*, and *Merulinæ* are finally examined.

7. ——. On the Replacement of a True Theca or Wall by an Epitheca in some Serial Coralla, and on the importance of the structure in the growth of the incrusting Coral. J. L. S. xvii. pp. 361–366.

8. Fewkes, J. W. Annelid Messmates with a Coral. Am. Nat. xvii. pp. 595–597.

The Annelids found on *Mycedium fragile* and *Porites astræoides* are truly commensal.

9. Greeff, K. Sur les pêcheries de Corail sur la côte de l'île Cap Vert San Jago. Arch. Z. expér. (2) i. p. xxxii. [*Cf.* Zool. Rec. xix. *Cœl.* p. 10.]

10. Gregorio, — de. Coralli Giuresi di Sicilia. Palermo: 1882, 12 pp.

11. ——. Coralli Titonici di Sicilia. Palermo: 1882, 11 pp.

[Not seen by Recorder.]

12. Geikie, A. The Origin of Coral Reefs. Nature, xxix. pp. 107–110, woodcut, 124, map.

After a summary of the views that have recently been put forward by Semper, Rein, Murray, and Agassiz, the author says that both barrier reefs and atolls must be admitted to be capable of formation without a general subsidence. The general phenomena which are considered to point to subsidence are three: first, The presence of so many peaks

coming from great depths to the level of the ocean ; this, however, may be accounted for partly by the denudation of land above the level of the water, and partly by the constant rain of lime that is always going on, bringing submerged peaks up to the level in which corals will live. Secondly, The precipitous descent of the outer banks of the barrier reefs ; but this may be accounted for by a reef growing out on a talus of its own débris, as shown by Murray. Thirdly, The depth of some lagoons and lagoon channels. The author admits that the explanation of this phenomenon is not wholly satisfactory.

13. Haug, Emil. Ueber sogenannte *Chætetes* aus mesozoischen Ablagerung. JB. Mineral. 1883, pp. 171–179, pl. x.

14. Herdman, W. A. On the Structure of *Sarcodictyon*. P. Phys. Soc. Edinb. 1883, p. 1 *et seq.*, pls. i.–iii.

Two forms dredged in Loch Fyne ; the red and yellow are only varieties of the same species, *S. catenata*. The relations of the genus are undoubtedly with *Cornularia* and *Clavularia*.

15. Hickson, S. J. On the Ciliated Groove (Siphonoglyphe) in the Stomodæum of the Alcyonarians. Phil. Tr. clxxiv. pp. 693–705, pls. l. & li. Abstracts in P. R. Soc. xxxv. pp. 280 & 281, and J. R. Micr. Soc. (2) iii. p. 855.

In *Alcyonium*, there is a ciliated groove on the ventral side of the stomodæum, which the author proposes to call 'siphonoglyphe' ; it is found in the following genera :— *Clavularia*, *Tubipora*, *Spongodes*, *Nephthya*, *Briareus*, *Cœlogorgia*, &c. In the dimorphic forms, a siphonoglyphe is present in the siphonozooids, but absent in the autozooids. In the *Gorgoniidæ*, it is absent. After some remarks on the classification and phylogeny of the *Alcyonaria*, the following classification of the group is proposed :—

1. *Proto-Alcyonaria*, containing the simple isolated genera.
2. The *Stolonifera*, containing those forms with stolons, such as *Tubipora*, *Clavularia*, &c.
3. The *Pennatulida*.
4. The *Gorgoniidæ*, containing the *Primnoaceæ* and *Gorgonaceæ*, with no siphonoglyphe.
5. The *Alcyoniidæ*, containing the remaining Alcyonarians.

16. ——. The Structure and Relations of *Tubipora*. Q. J. Micr. Sci. 1883, pp. 556–577, pls. xxxix. & xl.

In young specimens still attached to the rock or coral on which they grow, an incrusting stolon may be seen from which the colony springs. This stolon is similar to that of *Cornularia*, *Clavularia*, &c. The 'infundibuliform tabulæ' are of very various shapes, some being quite flat, others cup-shaped, others funnel-shaped, and others extending along in the form of an inner tube. The author describes the anatomy of the soft parts, and shows that the tabulæ are formed by a shrinking of the inner endodermic lining of the tube and the subsequent formation of spicules upon it. In a subsequent discussion of the relations of *Tubipora*, its affinities with *Syringopora* and *Favosites* are pointed out, and an

opinion expressed that *Syringopora* and the *Favositidæ* should be placed amongst the *Alcyonaria*.

17. Koch, G. von. Die ungeschlechtliche Vermehrung (Theilung und Knospung) einiger palæozoischen Korallen. Palæontogr. xxix. p. 327, pls. xli.-xliii.

The author commences by describing the multiplication of the following palæontological corals:—*Stauria favosa*, *Acervularia*, *Fascicularia*, *Heliolites*, *Favosites*, *Syringopora*, and *Syringophyllum*; and then passes on to describe the same process in the following recent corals:—*Galaxea*, *Astroides*, *Heliopora*, and *Tubipora*. As a result of these investigations he is able to distinguish the following different modes of budding:—

I. Internal budding.
  A. Budding by division.
  B. Internal gemmation.
    a. Septal gemmation.
    b. Tabular gemmation.
II. External budding.
  A. Intermediate gemmation.
  B. Cœnenchym gemmation.
  C. Stolon gemmation.

The paper concludes by a description of the part played by the soft parts in the process.

18. Koren, J., & Danielssen, D. C. New Alcyonarians. Gorgonids and Pennatulids of the Norwegian Seas. Bergen: 1883, 4to, 38 pp., 13 pls. Abstr. in J. R. Micr. Soc. (2) iv. p. 239.

The authors describe a new genus, *Duva*, with 3 new species, and a new genus (*Gœndul*) of Pennatulids, constituting a new family, *Gœnduleæ*.

19. Kowalewsky, A., & Marion, A. F. Documents pour l'histoire embryogénique des Alcyonaires. Ann. Mus. Marseille, i. pp. 1–43, pls. i.–v.

The paper commences with the description of the development of *Clavularia prolifera* and *Sympodium coralloides* [Zool. Rec. *Cœl.* xix. p. 12], and proceeds to describe some abnormal developments of the ovum of the latter. The second part contains some general considerations on the blastodermic layers of the Cœlenterates, and on the nature of the mesoderm, and the authors therein controvert the theory that the mesoderm layer of the Cœlenterates is homologous with the mesoblast layer of the Cœlomates.

20. Lacaze-Duthiers, H. de. Étude d'une Actinie prise comme type. Son embryogenie et son organisation. Rev. Sci. 1883, pp. 513–520.

This is a popular account of the anatomy and development of a Sea-anemone, illustrated by several woodcuts.

21. Lendenfeld, R. von. Zur histologie der Actinien. Zool. Anz. vi. p. 189.

The researches were made on species of *Adamsia*, *Anthea*, and *Phyllac-*

tinia. The cnidoblasts have communication with both nerve and muscle fibrils; those cells, on the other hand, which bear cilia are true supporting cells, and have no direct communication with either nerve or muscle, but are continuous with the supporting lamella.

21A. Lindström, D. Om de Palæozoiska Formationernas Operkelbärande Koraller. Sv. Ak. Handl., Bihang vii., No. 4, 6 lithographic plates. Abstr. by H. N. Moseley in Nature, xxviii. p. 35, 6 figs.

This paper contains a summary of all known forms. The author divides the group into (1) the *Calceolidæ*, having the septa on the inner face of the operculum not alike, and a median septum the largest; (2) the *Aræopomantidæ*, with the septa on the operculum all alike, and no defined median septum. In successive Silurian strata, a series of three modifications of the form *Goniophyllum pyramidale* are met with.

22. ——. Silurische Korallen aus Nord Russland und Sibirien. Abstr. from Sv. Ak. Handl., Bihang vi., No 18, pl., by E. Kayser in JB Mineral, 1883, p. 136.

The genera *Favosites* and *Heliolites* are found most abundantly; *Columnopora*, *Houghtonia*, and *Calapœcia* occur together.

23. Marshall, A. M. On the Polymorphism of the *Alcyonaria*. Rep. Brit. Ass. 1883, p. 529. Abstracts in J. R. Micr. Soc. (2) iii. pt. 6, p. 855, and Nature, xxix. p. 580.

In *Pennatula phosphorea*, certain zooids along the ventral surface are much enlarged, and assume the form of conical spikes, which assume a length of a quarter of an inch. In *Umbellula gracilis*, there are zooids bearing one tentacle.

24. ——. Report on the *Pennatulida* dredged by H.M.S. 'Triton.' Tr. R. Soc. Edinb. xxxii. pp. 119–152, pls. xxi.–v.

The most remarkable fact is the great number of forms dredged at a depth of 555 fath. The results do not lend support to Kölliker's statement that the simpler forms of Pennatulids inhabit great depths. *Umbellula* is not a primitive, but a highly differentiated form.

25. Nicholson, H. A. Contributions to Micro-Palæontology. On *Stenopora howsii*, Nich., with notes on *Monticulipora tumida*, Phill., and remarks on *Tabulipora urii*, Young [39, *infrà*]. Ann. N. H. (5) xii. pp. 285–297, pl. x., 3 woodcuts.

Stenopora howsii is most nearly allied to *S. tasmaniensis*, but it is also related to *Monticulipora* (?) *tumida*, Phill. *Tabulipora urii*, Young, is very similar to *Stenopora howsii*, differing only in the structure of its walls.

26. Parfitt, E. On the Temperature and Coral Fauna of the Greensand Sea. Tr. Devon. Ass. 1883, p. 416.

27. Pratz, E. Eocene Korallen aus der Libyschen Wüste und Aegypten. Palæontogr. xxx. p. 220, pl. xxxv.

28. Ridley, S. O. Notes on the Zoophytes and Sponges obtained by Mr. F. Day off the East Coast of Scotland. J. L. S. xvii. p. 105.

Very few *Anthozoa* were found; *Alcyonium*, however, was abundant.

29. [Ridley, S. O.]. The Coral Fauna of Ceylon, with descriptions of new species. Ann. N. H. (5) xi. p. 250.

The coral fauna of Ceylon differs from that of the rest of the Indian Ocean in having 1 peculiar species of *Caloria*, 1 of *Pavonia*, and 1 of *Alcyonium*, the nearest allies of the 2 latter being found in the Pacific Ocean. There are 48 or 49 species of corals, of which 4 are not known to occur elsewhere.

30. Stearns, R. E. C. Description of a New Genus and Species of Alcyonoid Polyp from Japanese Waters, with remarks on the structure and habits of related forms, etc. P. U. S. Nat. Mus. vi. pp. 96–201, pl. vii. Abstr. in Am. Nat. xvii. p. 1292.

Verrillia occurs on cod banks of the Shumagin Islands, annoying fishermen by entangling their nets. The mobility of some Virgularian forms is confirmed.

31. Studer, T. Californische Korallen. MT. Ges. Bern, 1883, p. 63. [Not seen by Recorder.]

32. Tomes, R. F. On the *Madreporaria* of the Inferior Oolite of the Neighbourhood of Cheltenham and Gloucester. J. G. Soc. xxxviii. pp. 409–450, pl. xviii.

33. ——. Description of a New Species of Coral from the Middle Lias of Oxfordshire. *L. c.* p. 95.

34. ——. On the Fossil *Madreporaria* of the Great Oolite of the Counties of Gloucester and Oxford. *Op. cit.* xxxix. pp. 168–196, pl. vii.

35. ——. On some New or Imperfectly Known *Madreporaria* from the Coral Rag and Portland Stone of the Counties of Wilts, Oxford, Cambridge, and York. *L. c.* pp. 555–564, pl. xxii.

The genera added to the coral rag of England are *Astrocœnia*, *Dimorpharæa*, *Latimæandra*, and *Craterocoris* (n.).

36. Verrill, A. E. Notice of the remarkable Marine Fauna occupying the outer banks off the Southern coast of New England. *Anthozoa*. Am. J. Sci. (3) xxiii. [1882] pp. 222–225, 309–316, xxiv. [1882] pp. 362 & 363. Abstr. in J. R. Micr. Soc. (2) iii. p. 854.

37. ——. Report on the *Anthozoa*, and on some additional species dredged by the 'Blake' in 1877–79, and by the U. S. Fish Commission steamer 'Fish Hawk' in 1880–82. Bull. Mus. C. Z. xi. No. 1, 72 pp., 8 pls.

38. Wilson, E. The Development of *Renilla*. Phil. Tr. clxxiv. pp. 723–815, pls. lii.–lxvii. [Zool. Rec. xix. *Cœl.* p. 15.]

39. Young, J. On Ure's "Millepore" *Tabulipora* (*Cellepora*) *urii*, Flem. Ann. N. H. (5) xii. p. 154.

A letter in which the writer describes a series of thin perforated tabulæ in the outer portion of the tubes of the corallites. The perforation of the tabulæ is reniform or roundly crescentic. Tabulæ are numerous, 5–8 in each corallite. He proposes the new subgeneric name *Tabulipora* for it.

40. Zeller, G. Algen und Zoophyten in Nordischen Meer und Sibirien. JH. Ver. Württ. xxxix. pp. 104–106.
[Not seen by Recorder.]

New genera and species :—

POLYACTINIÆ.

Actinaria.

Urticina longicornis, p. 222, 120–325 fath., *U. perdix*, p. 223, 61–115 fath., *U. callosa*, p. 224, Gulf of Maine and off Nova Scotia, *U. consors*, pp. 225, 160–458 fath., Verrill, (36).

Actinernus saginatus, Verrill, (36) p. 225, 458 fath.

Adamsia sociabilis, id. *ibid.*, 86–300 fath.

Sagartia acanellæ, p. 46, various localities, *S. spongicola*, p. 47, Delaware Bay, Verrill, (37).

Actinauge, g. n., Verrill, (37) p. 50. Large Actinians, with the tentacles and upper part of the body capable of involution; basal disk may be broad, flat, and adherent; tentacles long and contractile; lips with large folds and gonidial grooves. Closely allied to *Tealia* and *Actinernus*. For *Actinia nodosa* and *Actinauge nexilis*, p. 56, Martha's Vineyard, 168–245 fath.

Actinostola, g. n., Verrill, (37) p. 56. Size large; integument thick, firm, and leathery; not very contractile; the tentacles are numerous, thick, and short. Disk usually deeply concave; mouth large, with large strongly-lobed lips; large gonidial grooves. This genus is allied to *Bolocera*, *Urticina*, and *Actinauge*. For *Urticina callosa*, Verrill.

MADREPORARIA.

Thamnastræa walfordi, Tomes, (33), Lias of Oxfordshire, *T.* (*Symnastræa*) *crickleyensis*, p. 435, Crickley Hill, *T.* (*S.*) *duncani*, p. 436, Crickley Hill, *T. wrighti*, p. 436, Ravensgate Hill, &c.; *T. flabelliformis*, p. 438, Crickley Hill, Tomes, (32); *T. microphylla*, p. 188, Burford, Tomes, (34).

Oroseris oolitica, p. 440, Crickley Hill, *O. concentrica*, p. 441, Crickley Hill, *O. contorta*, p. 441, Crickley Hill, *O. incrustans*, p. 442, Sheepscombe, *O. gibbosa*, p. 442, Leckhampton Hill, Tomes, (32); *O. slatteri*, p. 192, Fairford, Tomes, (34).

Tricycloseris limax, Tomes, (34) p. 191, Fairford.

Dimorpharæa pedunculata, Tomes, (32) p. 445, Brookthorpe.

Phylloseris, g. n. The corallum consists of one or more upright foliaceous plates or fronds, of very irregular form, and thin at the margin. One of their flat and upright surfaces is furnished with calices arranged in transverse lines or bands, running from side to side, as in the genus *Agaricia*. The spaces dividing these lines are covered by a membranous and wrinkled epitheca, extending upwards quite to the margins of the

calices. Generally, the frond towards the bottom is covered by epitheca. *P. rugosa*, p. 447, Crickley Hill. Tomes, (32).

Crateroseris, g. n. The corallum is composite, massive, and of depressed turbinate form, and the calicular surface is superior and convex. *C. fungiformis*, p. 560, Steeple Ashton. Tomes, (35).

Plesioseris, g. n. With true wall septa, like that of the *Astræidæ*; Duncan, (6) p. 318.

Cycloseris ægyptica, Pratz, (27) p. 225, Minieh.

Mesomorpha, g. n. Corallum massive, knobbed, sometimes encrusting; the neighbouring septa bound together by well-marked synapticulæ. Related to *Siderastræa* and *Astræomorpha*. *M. schweinfurthi*, p. 227, Wady Natfe. Pratz, (27).

Narcissastræa, g. n. Corallum massive, composed of long polygonal cells, without septo-costal radii or cœnenchym; pali present, forming a wreath; columella wanting. *N. typica*, p. 228, Aradj. Pratz, (27).

Montivaultia slatteri, p. 182, Fairford. *M. fairfordensis*, p. 181, Fairford, Tomes, (34); *M. concinna*, p. 417, Chipping Campden, *M. porpita*, p. 419, Leckhampton and Ravensgate Hills, Tomes, (32).

Thecosmilia slatteri, Tomes, (34) p. 182, Fairford and Burford.

Caloria ascensionis var. *indica*, p. 256, Ceylon, *C. ceylonica*, p. 256, Ceylon, Ridley, (29).

Favia pedunculata, Tomes, (34) p. 183, Hook Norton.

Confusastræa tenuistriata, Tomes, (32) p. 423, Crickley Hill; *C. magnifica*, Tomes, (34) p. 184, Fawler.

Chorisastræa rugosa, Tomes, (32) p. 428, Crickley Hill.

Phymastræa vulgaris, Duncan, (5) p. 409, West Coast of India.

Latimæandra haimii, p. 423, Crickley Hill, *L. tabulata*, p. 427, Leckhampton Hill, Tomes, (32).

Phyllogyra, g. n. Corallum of more or less depressed and massive form, and composed of a series of leaf-like expansions proceeding laterally from a parent corallite, the curled-up margins of which unite and form sinuous cristiform ridges, having the lines of union very distinct in the younger, but much less so in the older examples. Allied to *Latimæandra*. *P. etheridgii*, p. 431, Coopers Hill, *P. sinuosa*, p. 431, Leckhampton Hill. Tomes, (32).

Goniocora cincinna, Tomes, (32) p. 432, Crickley Hill.

Bathycœnia, g. n. Closely allied to *Stylocœnia*. Corallum composite, compact, turbinate, and attached; corallites are intimately united by their walls. *B. slatteri*, p. 176, Fairford, *B. solida*, p. 177, Rollright. Tomes, (34)

Cryptocœnia microphylla, Tomes, (34) p. 179, Fairford.

Astrocœnia phillipsi, p. 188, Stonesfield, *A. major*, p. 557, Headington, Lyneham, and Marcham, Tomes, (34); *A. zitteli*, p. 230, *A. duodecim-septata*, p. 231, Galala Mountains, Wady Natfe, Pratz, (27).

Enallohelia clavata, Tomes, (34) p. 175, Fairford.

Tabulipora, subg. n., Young, (39).

OCTACTINIÆ.

ALCYONIIDÆ.

Alcyonium sub-murale, Ridley, (29) p. 251, Ceylon.

Gersemia long[i], Verrill, (37) p. 44, 1189 fath., lat. 38° N., long. 73° W.

PENNATULIDÆ.

Distichoptilum, g. n. Slender Pennatulids, with an axis through the whole length, and polyps arranged alternately, in a simple row on each side; calicles bilobed, appressed; zooids three to each polype, one in front, and one on each side of each cell; spicula abundant in the calicles, rhachis, and stalk. *D. gracile*, p. 362. Verrill, (36).

Pennatula aculeata, Daniels., var. n. *alba*; id. *l. c.* p. 310.

Virgularia tuberculata, Marshall, (24) p. 129.

Umbellula gracilis, Marshall, (24) p. 142, 555 fath.

Radicipes, g. n., Stearns, (30) p. 97. Its angularity of style and one-side arrangement of polyps point to *Pavonaria*, and its root-shaped base closely connects the Pennatulids with *Gorgonaceæ*. *R. pleuro-cristatus*, pl. vii. figs. 1 & 2.

Pavonaria percarinata, Ridley, (29) p. 258, Galle.

Gøndul, g. n., Koren & Danielssen, (18).

GORGONIIDÆ.

Duva, g. n., Koren & Danielssen, (18).

Verrill (37) describes the following:—

Acanella spiculosa, p. 17, 442 fath., St. Lucia, *A. simplex*, p. 17, Martinique and Barbadoes.

Lepidisis, g. n. Axis with long tubular calcareous joints alternating with short horny ones, simple or branched; base divided into long irregular flat lobes; cœnenchym thin, with an external layer of scale-like spicula. Allied to *Acanella*. *L. caryophyllia*, p. 18, Guadaloupe, &c., *L. longiflora*, p. 19, Grenada, &c., *L. vitrea*, p. 20, St. Lucien.

Chrysogorgi[i]dæ, fam. nov. The known species are all inhabitants of deep waters, and of W. Indian seas, except *Dasygorgia agassizi*, New England. The coral is variously branched, the branches most commonly taking a spiral arrangement. The axis is partially calcareous, generally with a brilliant iridescence and metallic lustre. The calicles are prominent and scattered along the branches, and covered with moderately long flat spicules.

The 3 genera are arranged as follows:—

A. Much branched, often spirally; the branches forking . . . . . } *Chrysogorgia*. *Dasygorgia*.

B. Axis forming a spiral or helix, with slender undivided branches in a single spiral row . } *Iridogorgia*.

Dasygorgia agassizi, p. 22, George's Bank, *D. elegans*, p. 23, Grenada,

Barbadoes, &c., *D. spiculosa*, p. 23, Dominica, &c., *D. squamata*, p. 24, St. Vincent, Barbadoes, *D. splendens*, p. 25, Santa Cruz.

Chrysogorgia fewkesi, p. 26, St. Vincent.

Iridogorgia pourtalesi, p. 27, Dominica.

Primnoa pourtalesi, p. 28, 337 fath., 31° N., 77° W.

Stenogorgia, g. n. Axis horny, branched, cœnenchyma thin, consisting of small warty fusiform spicula, with a few smaller [illegible]nule-like spicula; calicles scattered or two-rowed. Affinities to *Leptogorgia*; but resembling *Thesia* and *Eunicella*. *S. casta*, p. 30, 337 fath., 31° N., 77° W.

Acanthogorgia muricata, p. 34, Barbadoes.

Paramuricea grandis, p. 37, 337 fath., 41° N., 65° W., *P. tenuis*, p. 38, Barbadoes.

Eunicella modesta, p. 39, 337 fath., 31° N., 77° W.

RUGOSA.

Lindstrom (21A) describes the following :—

Rhizophyllum attenuatum = *Calceola attenuatum*, Lyon, p. 38.

Aracopoma, g. n. For *Cystiphyllum prismaticum*, Lindst., p. 58.

Rhytidophyllum, g. n. With only one valve covering a calceola-like coral. *R. pusillum*, p. 62, Gotland, Upper Silurian.

SPONGIÆ.

BY

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List of Works on Recent Sponges.

1. Carter, H. J. Further Observations on the so-called "Farringdon Sponges" (*Calcispongiæ*, Zittel), followed by a Description of an Existing Species of a like kind. Ann. N. H. (5) xi. pp. 20–37, pl. i.

2. ——. Contributions to our [illegible]e of the *Spongida*: *Pachytragidæ*. Tom. cit. pp. 344–369, pls. xiv. & xv.

3. ——. New Genus of Sponges. *Tom. cit.* pp. 369 & 370, pl. xv. fig. 10.

4. ——. On the Presence of Starch Granules in the Ovum of the Marine Sponges, and on the Ovigerous Layer of *Suberites domuncula*, Nardo. *Op. cit.* xii. pp. 30–36 (with woodcut); abstract in J. R. Micr. Soc. (2) iii. p. 669.

5. ——. Contributions to our Knowledge of the *Spongida*. Tom. cit. pp. 308–329, pls. xi.–xiv.

6. ——. Spicules of *Spongilla* in the Diluvium of the Altmühl Valley, Bavaria. *Tom. cit.* pp. 329–333, pl. xiv.

7. Chilton, C. A New Zealand Fresh-water Sponge. N. Z. J. Sci. i. pp. 383 & 572.

8. Döderlein, L. Faunistische Studien in Japan, Enoshima, und die Sagami-Bai. Arch. f. Nat. (2) xlix. p. 102, pl. ii.

9. Faber, G. L. Sponge Fisheries of the Adriatic, in "The Fisheries of the Adriatic." London: 1883, 4to, p. 96.

10. Hilgendorff, F. Süsswasser-schwämm aus Central Afrika gesammelt von Dr. R. Böhm im Ugalla Fluss beim Tanganyika-See. SB. nat. Fr. 1883, pp. 87–90. [Translated in Ann. N. H. (5) xii. p. 120.]

11. Lendenfeld, R. v. Über Cœlenteraten der Südsee. II. Mitth. Neue *Aplysinidæ*. Z. wiss. Zool. xxxviii. pp. 234–313, pls. x.–xiii.; abstract in J. R. Micr. Soc. (2) iii. p. 519.

12. Marenzeller, E. v. Propagation of Sponge by Cuttings. Am. Nat. xvii. pp. 200–203.

13. Marshall, W. Über einige neue von Herrn Pechuël-Loesche aus dem Congo gesammelte Kiesel-schwämme. Jen. Z. Nat. xvi. (n. f. ix.) p. 553; abstract in J. R. Micr. Soc. (2) iv. p. 66.

14. ——. Einige vorläufige Bemerkungen über die Gemmulæ der Süsswasser-schwämme. Zool. Anz. 1883, pp. 630–634 & 648–652.

15. Merejknosky, C. de. Nouvelles recherches sur la zoonerythrine et autres pigments animaux. Bull. Soc. Zool. Fr. viii. p. 81.

16. Nassonow, M. Zur Biologie und Anatomie der *Clionæ*. Z. wiss. Zool. xxxix. pp. 295–308, pls. xvi. & xvii.; abstract in J. R. Micr. Soc. (2) iv. pp. 65 & 66, Biol. Centralbl. iii. p. 768, and Am. Nat. xviii. p. 85.

17. Polejaeff, N. Über das Sperma und die Spermatogenesis bei *Sycandra raphanus*, Haeck. SB. Ak. Wien, lxxxvi. pp. 276–298 [1882]; abstract in J. R. Micr. Soc. (2) iii. p. 857, and Biol. Centralbl. iii. pp. 180 & 181.

18. Potts, E. Fresh-water Sponges: what, where, when, and who wants them. Bull. U. S. Fish Comm. iii. pp. 389–391.

19. ——. Our Fresh-water Sponges. Am. Nat. xvii. pp. 1293–1296.

20. Priest, B. W. Statoblasts of the Fresh-water Sponges. J. Quek. Club (2) i. pp. 173–181, pl. vii., and Am. Micr. J. iv. pp. 208–213.

21. Rathbun, R. Sponge Culture in Florida. Science, ii. p. 213.

22. Ridley, S. O. Notes on Zoophytes and Sponges obtained by Mr. F. Day, off the East coast of Scotland. J. L. S. xvii. pp. 106–108.

23. Retzer, W. Die deutschen Süsswasser-schwämme. Inaug. Diss. Tübingen, 1883, 8vo, pp. 1–30, pls. i. & ii.

24. Solger, B. Über einige der anatomischen Untersuchung zugängliche Lebenserscheinungen der Spongien. Biol. Centralbl. iii. pp. 227–235; abstract in Kosmos, xiii. pp. 300–302, and J. R. Micr. Soc. (2) iii.

25. Thoulet, J. Sur les spicules siliceux des éponges vivants. C.R. xcviii. pp. 1000 & 1001.

26. Vejdovsky, F. Revisio Fauna Bohemica. I. Die Süsswasser-schwämme Böhmens. Abh. böhm. Ges. (6) xii.; abstract in J. R. Micr. Soc. (2) iii. pp. 858–860.

27. ——. Beiträge zur Kenntniss der Süsswasser-schwämme. SB. böhm. Ges. 1883, pp. 19–31.

28. [VEJDOVSKY, F.], in Abh. böhm. Ges. (6) xii. ; abstract in J. R. Micr. Soc. (2) iv. pp. 242 & 243, and Ann. N. H. (5) xiii. pp. 96–98.

29. VOSMAER, G. C. J. *Porifera*,. Pt. 2. Bronn's Klassen u. Ordn. pp. 33–65, pls. v. & vi.

30. ——. Studies on Sponges. 1. On *Velinea gracilis*, g. & sp. nn. MT. z. Stat. Neap. iv. pp. 437–447, pls. xxxi. & xxxii.

31. WALLER, —, in J. Quek. Club (2) i. pp. 216–223, pl. i. ; abstract in J. R. Micr. Soc. (2) iii. p. 668.

32. WELTNER, W. Beiträge zur Kenntniss der Spongien. Freiburg : Inaugural Dissertation (1882).

LIST OF WORKS ON FOSSIL SPONGES.

33. BARROIS, C. Sur les *Dictyospongidæ* des Psammites des Chondroz. Ann. Soc. Géol. Nord, xi. pp. 80–86.

CARTER, H. J. [See No. 1.]

34. ——. On the Microscopic Structure of Thin Slices of Fossil *Calcispongiæ*. Ann. N. H. (5) xii. pp. 26–30.

——. [See No. 6.]

35. DUNIKOWSKI, E. v. Die Pharetronen aus dem Cenoman von Essen u. die Systematische Stillung der Pharetronen. Palæontogr. xxix. pp. 281–324, pls. i.–iii.

36. FUCHS, T. Welches Ablagerungen haben wir als Tiefseebildungen zu betrachten ? JB. Mineral. 1883, p. 487. (Some remarks on Sponges appear in this paper.)

37. KLEMM, E. Uber alte und neue Ramispongien und andere verwandte Schwammformen aus der greislinger Gegend. JH. Ver. Württ. xxxix. pp. 243–308.

38. LINK, G. Zwei neue Spongien-gattungen (*Didymosphæra* and *Polyrhizophora*). JB. Mineral. 1883, pp. 59–62, pls. ii. & iii.

39. POCTA, PHILIPP. Beiträge zur Kenntniss der Spongien d. Böhmisches Kreideformation. Pt. 1. *Hexactinellidæ*. Abh. böhm. Ges. (6) xii. pp. 1–45, pls. i.–iii.

40. ——. Einige Bemerkungen über d. Gitterskelet derfossilen Hexactinelliden. SB. böhm. Ges. 1883.

41. PORTIS, A., in Mem. Acc. Tor. (2) xxxiv. p. 71.

42. SOLLAS, W. J. Description of Fossil Sponges from the Inferior Oolite, with a notice of some from the Great Oolite. J. G. Soc. xxxix. pp. 541–554, pls. xx. & xxi.

43. ——. The Estuaries of the Severn and its Tributaries ; an inquiry into the nature and origin of their tidal sediment and alluvial flats. *L. c.* 611–626, with 2 woodcuts.

RECENT SPONGES.

General.

Vosmaer (29), in the introduction to his work on Sponges, continues the history of the group from 1792 to 1856.

Potts (18 & 19) and Priest (20) give popular accounts of fresh-water Sponges and their statoblasts.

Anatomy and Histology.

Lendenfeld (11) gives a full description of the anatomy and histology of *Aplysilla violacea* (sp. n.) and *Dendrilla* (g. n.) *rosea* (sp. n.), and *D. aerophoba* (sp. n.). Especially novel is the presence of glandular cells situated beneath the ectodermal epithelium of these Sponges. They resemble in form and structure sponginoblasts, with which the author regards them as homologous and analogous.

Vosmaer (30) describes fully the anatomy and histology of *Velinea* (g. n.) *gracilis* (sp. n.).

Ridley (22) describes and figures the oscula of *Suberites ficus*.

The structure of the statoblasts of various fresh-water Sponges is described by Vejdovsky (26, 27, '28), Marshall (13, 14), Retzer (23). Marshall suggests a comparison between the statoblasts of fresh-water Sponges, and the external gemmules of certain marine Sponges.

The structure of the ovum of *Suberites domunculus*, Nardo, and of the ovigerous layer of this Sponge, are described by Carter (4).

Carter (5) describes a new form of Esperine spicule; it has the form of the letter C, with five claws at each end.

Ontogeny.

Polejaeff (17) describes the development of the spermatozoa in *Sycandra raphanus* growing at Trieste.

Nassanow (16) briefly describes the early development of *Cliona*.

Phylogeny.

Marshall (14) considers it probable that the fresh-water Sponges are derived by polyphyletic origin from the *Renieridæ*. Given Renierid Sponges isolated in different fresh-water areas under similar conditions, he considers that statoblasts (internal gemmules) may arise independently in all of them. Still, many fresh-water Sponges, e.g., *Lubomirskia* and *Potamolepis* (g. n.) are without statoblasts; these are probably late immigrants into fresh-water.

Physiology.

Lendenfeld (11) describes the results of experiments on the mode of nutrition of the Sponges described in his paper. He considers that the

subdermal cavities of Sponges have a gastric function. Carmine particles are absorbed by all free surfaces, both ectodermal and endodermal layers, but are subsequently cast out into the surrounding medium, except by the cells forming the floor of the subdermal cavities; these pass them on to the adjacent wandering amœboid cells, by which [illegible] absorbed, and subsequently, by the migration of these cells, carried to the flagellated chambers, to the collared cells of which they are transferred, and by them expelled into the excurrent canals, as effete residues. The author also investigates the functions of the glandular cells described by him. When irritated by the presence of fresh-water, they become remarkably active, pouring forth in large quantities a slimy secretion, the chief constituent of which is supposed to be spongiolin. A specimen of *Dendrilla rosea*, which weighed in the fresh state 77 grammes (the water of the osculer tube having been in greater part removed), was washed with distilled water and placed under a bell-jar; in fourteen hours its weight was reduced to 51 grammes, and 24.5 grammes of secreted matter had been poured out. The glandular cells and the epithelium of the exterior disappear as the secretion proceeds. The pigment granules of the amœboid and flagellated cells of the mesoderm are regarded as having a function somewhat similar to that of the red blood corpuscles of the higher animals.

Carter (4) describes the presence of starch granules and oil globules in the ova of several marine Sponges.

Nassonow (16) has watched the progress, in its various stages, of *Cliona*-embryos as they eat their way into a transparent lamella of carbonate of lime. He shows that the spicules take no part in the process of excavation.

Thoulet (25) gives the results of experiments on siliceous spicules derived apparently from an Hexactinellid Sponge. Heated to redness, they decrepitate violently, and turn white and opaque, without, however, losing their form. The loss in weight after calcination is 13.18 per cent. The specific gravity of the spicules was found to be 2.0361 at 16° 5 C. The substance of the spicules agrees, in all the characters displayed, with opal.

Marshall (14) argues, from the structure of the statoblast of *Spongilla nitens* (Carter), that it is adapted to transportation by winds; the statoblasts of *Parmula brownii*, a South American species, are firmly united to the Sponge skeleton, and hence are secured from detachment when in the dry state; the statoblasts of *S. fluviatilis* are heavier than those of *S. lacustris*, and this saves them from being washed too far away by the river current; the three layers of amphidiscs in the statoblast of *Myenia mirabilis* similarly serve to weight the statoblasts, and probably stand in relation to the rapidity of the river in which this Sponge occurs.

Vejdovsky (28) considers that the air-chambers of the statoblasts of *Trochospongilla erinaceus* have an aërostatic function; they are analogous to the natatory rings of the statoblasts of fresh-water *Polyzoa*.

Rathbun (21) describes first successful attempt at Sponge-cultivation in America. Four specimens, all of the finest or sheep's wool variety, were

raised at Key West, Florida. They increased from four to six times in bulk in six months.

MARENZELLER (14) gives an abstract of a former paper on the subject of Sponge-cultivation.

MEREJKNOSKY (15) finds the red pigment, zoonerythrine, in the following Sponges:—*Suberites domuncula*, *Suberites* sp., *[illegible]oides*, *A. cannabina*, *Spongelia* sp., *Reniera* 2 species, *Tuberella tethyoides*. He has also obtained a new violet pigment, suberitine, from *Suberites domuncula*. It is most abundant in the violet varieties, but not absent from the red varieties of this Sponge. Zoonerythrine is a member of the lipochrome series; it is widely diffused in the Animal Kingdom, and present in some plants; its function is respiratory.

SOLGER (24) gives a useful review of our present knowledge of the physiology of Sponges.

CLASSIFICATION.

VOSMAER (29) gives the following revision of the *Ceraospongiæ* :—

Fam. I. APLYSIDIDÆ (s. str.). Ciliated chambers not very large, pear-shaped; ultimate ramifications of the exhalent and inhalent canal system narrow; skeleton a more or less regular network of anastomosing fibres; walls of the fibres thin; axis-substance thick, no sand; ground substance of the mesoderm granular. *Aplysina*; probably also *Verongia*, *Dendrospongia*, *Ianthella*.

Fam. II. APLYSILLIDÆ (= *Aplysillinæ*, v. Ledfd.). Ciliated chambers large, pouch-shaped; inhalent canals communicate with the chambers by means of numerous pores, exhalent canals by one wide mouth; fibres ramified, tree-like, not anastomosing; axis of fibres rather thick, no sand; ground substance without granules. *Aplysilla*, *Dendrilla*; probably also *Darwinella*.

Fam. III. SPONGELIDÆ. Ciliated chambers large, pouch-shaped; inhalent canals communicate with the chambers by means of numerous pores, exhalent canals by one wide mouth; fibres anastomosing, to form a regular or irregular network; axis of fibre thin; main fibres often contain sand; ground substance without granules. *Spongelia*, *Velinea*.

Fam. IV. SPONGIDÆ. Ciliated chambers small, hemispherical; inhalent canals communicate with the chambers by means of numerous pores, exhalent canals by special wide canals; fibres anastomose to form an irregular network; axis of fibre hardly visible; main fibres often contain sand; ground substance in the neighbourhood of the ciliated chambers with numerous granules; no filaments. *Euspongia*, *Cacospongia*, *Phyllospongia*, *Carteriospongia*, *Stelospongia*.

Fam. V. HIRCINIDÆ. Ciliated chambers small, hemispherical; inhalent canals communicate with chambers by numerous pores, exhalent

canals by special canals; fibres anastomose to form an irregular network; axis of fibres scarcely visible; main fibres always, the other fibres often, contain sand and other foreign bodies; ground substance in the neighbourhood of the ciliated chambers with numerous granules; characteristic filaments in addition to skeleton-fibres abundant. *Hircinia, Oligoceras.*

Lendenfeld (11) illustrates the relationship between the genera of *Aplysinidæ* and the species of *Aplysilla* and *Dendrilla* as follows :—

A. rosea, Schze.	*A. sulphurea*, Schze.	*A. violacea*, R. v. L.	*D. rosea*, R. v. L.	*D. aerophoba*, R. v. L.
	Aplysilla, Crusts, numerous single spongiolin trees.		*Dendrilla*, Stalked clumps, a single spongolin tree (for skeleton).	
	Aplysininæ, Small pear-shaped flagellated chambers, granular matrix; anastomosing, horny fibres.		*Aplysillina*, Large sac-like flagellated chambers, hyaline matrix; not anastomosing, tree-like, horny fibres.	
		Aplysinidæ, Horny fibres without foreign bodies, with central mark cylinder.		

Carter (2) institutes a new family, the *Theneanina*, to receive the genera *Thenea*, Gray, and *Eccionema*, Bwk. The *Pachytragida* (Carter) will now include 4 families, viz., *Geodina*, Stellettina, *Tethyina*, *Theneanina*.

The *Geodina* are subdivided as follows :—

I. *Orthactinida* (arms of trifid spicule simple).
  a. *Proradiata*. b. *Planiradiata*. c. *Recurviradiata*.
II. *Dichelactinida* (arms of trifid spicule bifurcate).
  a. *Proradiata*. b. *Planiradiata*. c. *Recurviradiata*.

The *Stellettina* :—

I. *Psilodermata* (thin skinned).
  a. *Stellifera*, with minute stellata. b. *Bacillifera*, with bacilliform bodies.
II. *Pycnodermata* (thick skinned).
  a. *Discifera*, with discoid bodies. b. *Globostellata*, with globostellates.

The *Tethyina*, Carter (= *Tetillina*, Soll.) :—

I. *Azosta*, without zone spicules.
  a. *Sessilia*, sessile. b. *Radicifera*, rooted.
II. *Zostorophora*, with zone spicules.
  a. *Sessilia*. b. *Radicifera*.

The *Theneanina*, characterized by spinispirules, comprises :—
Thenea, Gray (*T. muricata*, Bwk., *T. wallichi*, Wright, *T. fenestrata*, O.S.).
Eccionema, Bwk. (*E. compressa*, Bwk., and *E. nana*, Carter).

VEJDOVSKY (26) reduces the European species of *Spongilla* to five—*S. lacustris*, *jordanensis*, *fluviatilis*, *mulleri*, and *erinaceus*; he recognizes one genus, *Spongilla*, which he divides into three subgenera—*Euspongilla*, *Ephydatia*, and *Trochospongilla*.

WINKLER (32) expresses his views on the relations of the genera *Pachastrella*, *Stelletta*, and *Geodia*, and the position of his new species, *S. transiens*, in the following scheme:—

Geodia.
Stelletta geodina, o.s.
Stelletta discophora, o.s. } *Stelletta transiens*.
Stelletta dorsigera, o.s. }
Stelletta.
|
Pachastrella.

NEW GENERA AND SPECIES.

CALCISPONGIÆ.

Leucetta clathrata, Carter, (1) S.W. coast of Australia, characterized by peculiar large triradiate spicules and a solid vermiculate fibrous reticulation.

CERAOSPONGIÆ.

Aplysilla violacea, Lendenfeld, (11) S. Australia; *Coscinoderma* (g. n.) *lanuginosum*, Carter, (5) Freemantle, S.W. Australia; *Dendrilla* (g. n.) *rosea* and *aerophoba*, Lendenfeld, (11) S. Australia; *Velinea* (g. n.) *gracilis*, sp. n., Vosmaer, (30) Mediterranean.

MONAXONIDÆ.

RENIERIDÆ. *Phlœodictyon* (g. n.) *singaporense*, Carter, (5) Singapore.

DESMACIDINÆ. *Hymeraphia forceps*, Waller, (31) Torbay, England; *Monanchora* (g. n.) *clathrata*, Carter, (5) Freemantle, S.W. Australia.

ECHINONEMATA. *Ectyon cylindricus*, Carter, and *E. flabelliformis*, Carter, (5) W. Indies; *E. mauritianus*, Carter, (5) Mauritius; *Ectyonopsis* (g. n.) *ramosus*, Carter, (5) S. Australia; *Leucophlœus* (g. n.) *compressus*, Carter, (5) Swan River, W. Australia; *L. massalis*, Carter, (5) Freemantle, S.W. Australia; *Phakellia ramosa*, Carter, (5) Sydney, S. Australia; *Phycopsis* (g. n.) *fruticosa*, Carter, (5) Van Diemen's Land; *P. hirsuta*, Carter, (5) S. Australia; *Ptilocaulis* (g. n.) *gracilis*, Carter, (5) W. Indies; *P. rigidus*, Carter, (5) Australia (?).

SPONGILLIDÆ. *Potamolepis* (g. n.) *chartaria*, *leubnitzia*, and *pechuelis*, Marshall, (13) from the Congo; *Spongilla bohmi*, Hilgendorff, (10) River Ugalla, near Lake Tanganyika; *Spongilla rhenana* and *S. mirabilis*, Retzer, (23) Germany; *Ephydatia amphizona*, Vejdovsky, (28).

Tetractinellidæ.

Stelletta australiensis, Carter, (2) Freemantle, S.W. Australia; *S. bacillifera* var. *robusta*, Carter, (2) Ports Elliot and Adelaide, Australia; *S. globo-stellata*, Carter, (2) Galle, Ceylon; *S. reticulata*, Carter, (2), locality (?); *Tethya* (*Tetilla*, auct.) *merguensis*, Carter, (2) King's Island, Mergui Archipelago, W. of Burma (in 1882); *Stelletta transiens*, Weltner, (32) from Barbadoes, 100 fath., and coast of Mexico; *Tribrachion schmidti*, Weltner, (32) from Morro Light, Mexico, 250–400 fath.

Synonymy.

Carter (6) identifies *Spongilla* (*Trochospongilla*) *crinaceus*, Ehrb., with *S. leidii*, Bwk.; but Vejdovsky (28) states that there is a difference in the structure of the statoblasts of the two species.

Vejdovsky (26) includes *Spongilla jordanensis*, Kusta, in *Euspongilla lacustris*, of which he recognizes two forms, one var. *macrotheca*, the other sp. *lacustris*, s. str. *Euspongilla jordanensis*, Vj., is not Kusta's species, and is closely similar to *E. siberica*, Dy.; *Ephydatia fluviatilis* = *Myenia* 1, Dy.; *E. mulleri*, Leib., = *Ephydatia* 2 and *Myenia* 2, Dy., and also *Myenia* 3, Dy. Two varieties of *E. mulleri* are recognized as form *A.* and form *B.*; and var. (?) *astrodiscus* = *Myenia* 3, Dy.

Vejdovsky (28) subsequently establishes *Ephydatia amphizona*, sp. n., = *E. mulleri* forma *B.*, and restricts *E. mulleri*, Leib., to his own var. *astrodiscus*.

Suberites dominicula, Nardo, = *Hymeniacidon suberea*, Bwk.; Carter, (4).

Distribution.

General. Sollas (42) points out that existing Hexactinellids and Lithistids occur in water as shallow as 18 fath., and that the majority of Dictyonine Hexactinellids occur at from 100 to 150 fath. He considers that their distribution is influenced less by depth than constancy of temperature.

Europe. Vosmaer (29) describes *Velinea gracilis* (g. & sp. nn.), from the Mediterranean; Waller, (31) *Hymeniacidon forceps*, sp. n., from Torbay England.

Carter (6) states that *Spongilla carteri* is found in Central Europe, India, Mauritius, and the Isle of Madura, Japan; also that *Spongilla crinaceus*, Ehrb., occurs in the Schuylkill River, N. America, as well as in Bohemia.

Ridley (22) records *Suberites ficus* and *Amphilectus edwardi*, Bwk., from the East coast of Scotland, at 40 and 42 fath.

Africa. Marshall (13) describes 3 new species of *Spongillidæ* from Isangila, on the River Congo; Hilgendorff (10) describes *Spongilla nitens*, Carter, and *Spongilla bohmii*, sp. n., from River Ugalla, near Lake Tanganyika. Hilgendorff thinks that the specimen of *S. nitens* described by Carter from S. America more probably came from Africa.

West Indies. *Ectyon flabelliformis* and *E. cylindricus*, *Ptilocaulis gracilis*, Carter, (5).

Mauritius. *Ectyon mauritianus*, Carter, (5).

Japan. DÖDERLEIN (8) gives notes on the fauna of shallow and deep water, mentions *Siphonochalina papyracea*, used in default of true bodies of *Hyalonema* for attaching to the "glass rope." The locality where *Hyalonema* occurs was looked for without success, but a single specimen was dredged off Yogashima at a depth of 200 fath.

Ceylon. *Stellata globo-stellata*, Carter, (2).

Burma. *Tethya* (*Tetilla*) *merguensis*, Carter, (2).

Australia. LENDENFELD (11) describes *Aplysilla violacea*, sp. n., *Dendrilla rosea*, sp. n., *D. aerophoba*, sp. n., from Australia. CARTER (2 & 5) describes *Stelletta australiensis*, *S. bacillifera* var. *robusta*, *Monanchora clathrata*, *Coscinoderma lanuginosum*, *Ectyonopsis ramosus*, *Phakellia ramosa*, *Phycopsis hirsuta*, *Leucophlœus massalis* and *L. compressus*, from Australia.

Tasmania. *Phycopsis fruticosa*, Carter, (5).

FOSSIL SPONGES.

ANATOMY.

DUNIKOWSKI (35) describes the structure of several species of *Pharetrones* from Essen, giving a full account of the characters of their spicules and fibre; the latter he regards as formed by mineral change after the death of the Sponge. CARTER (1) also describes the structure of some species of *Pharetrones*. In another paper (34) he states the presence of pin-like spicules in *Verticillites helvetica* and *V. anastomosans*; they form an incrusting layer, and are stuck in the Sponge with the heads outwards. WELTNER (32) compares the structure of the covering layer of recent and fossil Hexactinellids, and concludes that it is essentially the same in both.

CLASSIFICATION.

DUNIKOWSKI (35) concludes, after a searching investigation, that the *Pharetrones* of Essen are ancient *Leucones*, and subdivides them into three groups, the *Palæoleucandridæ*, *Palæoleucaltidæ*, and *Palæoleucortidæ*.

CARTER, (1) from a further examination of the "Farringdon" Sponges, is also led to believe that the *Pharetrones* are fossil Calcareous Sponges; at the same time, he remains of the opinion that *Pharetrospongia* was originally, as Sollas stated, a siliceous Sponge allied to the *Renieridæ*. A new species of Calcisponge is described as closely similar in skeletal characters to *Sestrostomella*.

NEW GENERA AND SPECIES.

CALCISPONGIÆ.

DUNIKOWSKI (35) describes *Elasmostoma bitectum*, *Peronella furcata* var. *ramosissima*, *Sestrostomella essensis*, from the Cenomanian of Essen. SOLLAS (42) describes *Lymnorea pygmea*, *Peronella repens*, *Thamnonema*

(g. n.) *pisiforme*, *Myrmecium depressum*, from the Great Oolite of Hampton Down, and *Peronella metabronnii*, from the Inferior Oolite of Burton Bradstock.

Lithistidæ.

Platychonia elegans, Sollas, (42) from Inferior Oolite, Burton Bradstock, and *Polyrrhizophora jurassica*, Link, (38) from the Malm, Sontheim, Schwabia, are *Rhizomorina*. *Didymosphara steinmanni*, Link, (38) from same locality, is an *Anomocladina*.

Hexactinellida.

Pocta (39) describes *Craticularia radicosa*, *C. grandis*, *C. explanata*, *C. parva*, *C. vulgata*, *C. mirabilis*, *C. zitteli*, *Leptophragma exilis*, *L. cauliformis* [*-me*], *L. scyphus*, *Petalope* (g. n.) *auriformis*, *P. foveata*, *Synaulia* (g. n.) *germinata*, *S. patinaformis* [*-nif-*], *Lopanella* (g. n.) *depressa*, *Botroclonium* (g. n.) *arborescens*, *B. celatum*, *Ventriculites korytzanensis*, *V. inolescens*, *Plocoscyphia insignis*, *Cyrtobolia* (g. n.) *morchella*, *Cœloptychium frici*, from the Cretaceous formation of Bohemia.

Sollas (42) describes *Emploca* (g. n.) *ovata*, *Mastodictyum* (g. n.) *whidborni*, *Leptophragma fragilis*, *Plectospyris* (g. n.) *elegans*, *P. major*, *Calathiscus* (g. n.) *variolatus*, from the Inferior Oolite of Burton Bradstock.

Barrois (33) describes *Dictyophyton morini*, from the Psammites du Chondroz at Jumont, = Upper Devonian of the Ardennes. Another species from same locality is identified with *D. tuberosum*, Conrad. The wide distribution of *Dictyophyton* during the Chenning Epoch is in striking illustration of the great uniformity which characterized the faunæ of Palæozoic times.

Miscellaneous.

Carter (6) describes the occurrence of spicules of fresh-water Sponges in the alluvium of the Altmühl Valley, Bavaria.

Sollas (43) describes the presence of spicules of marine Sponges in the alluvium of the Severn and its estuaries ; similar spicules are at present carried by tidal currents from the sides of the Bristol Channel (Ilfracombe and Swansea) up the Severn estuary past Gloucester. Spicules of marine Sponges also occur in the mud of the Thames at London Bridge.

PROTOZOA.

BY

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GRASSI, L. Sur quelques Protistes endoparasites appartenant aux classes des *Flagellata*, *Lobosa*, *Sporozoa*, et *Ciliata*. Arch. Ital. Biol. ii. [1882] pp. 402-444; iii. pp. 23–37, pls. i.–iv. [*Cf.* J. R. Micr. Soc. (2) iii. pp. 673–675.]

Class *Flagellata* : 5 fams., viz., (1) *Cercomonas*, Duj., pt., including *Monocercomonas*, Grassi, *M. insectorum*, sp. n. (= *Schedoacercomonas melo-*

lonthæ and *S. gryllotalpæ*, Grassi), *Cimænomonas*, g. n., *Plagiomonas*, g. n. (based on *Retortomonas gryllotalpæ*, Grassi), *Monomita*, g. n., *Heteromita* and *Dicercomonas*, Duj., *D. muris*, sp. n. (from *Mus* and *Arvicola*); (2) *Megastomidea*, fam. n., type *Dimorphus muris*, Grassi (from 4 spp. of *Mus*, *Arvicola*, the cat, and man); (3) *Lophomonadidea*, type *Lophomonas blattarum*, Stein; (4) *Trichomonadidea*, fam. n., for *Trichomonas melolonthæ*, Grassi; (5) *Trypanosomata*, Kent, includes *Trypanosoma* and *Paramecioides*, Grassi (containing *T. eberthi*, Kent, and *P. costatus*, sp. n., from blood of *Rana esculenta*). Class *Lobosa*: *Amœba coli*, Lösch., *A. muris*, sp. n. (from rats and mice), *A. ranarum*, Grassi, may be related to the associated *Paramecioides costatus*, sp. n., *A. chætognathi* (= *A. sagittæ*, Grassi) and *A. pigmentifera*, spp. nn., both from the 6 species of *Chætognatha* of the Straits of Messina. Class *Sporozoa*: *Coccidium rivolta*, sp. n. (from intestine of cat), ? sp. n. of *Coccidium* from a *Coronella*, *Moneron* from blood of *Hyla viridis*, &c.

The author combats Cunningham's views on Monocercomonads and *Amœbæ* of man, and groups the association or symbiosis of living forms under three heads: (1) Reciprocal advantage, he terms alliance (consorzio), mutualism of Van Beneden; (2) harmless association, he calls, with Van Beneden, commensalism; (3) advantage to one, harmful to the other, is parasitism. After drawing some medical conclusions, he concludes by stating: (1) Certain *Amœbæ* undergo a cycle comparable with that of *Protomyxa aurantiaca*; (2) the present classification of Flagellates should be reformed; (3) certain kinds of *Protistæ* (Coccids) are not properly determinable without a knowledge of their development. The plates illustrate *Monocercomonas hominis*, *M. insectorum*, *Heteromita lacertæ*, *Cimænomonas batrachorum*, *Monomita muscarum*, *Plagiomonas gryllotalpæ*, *Heteromita ? caviæ*, the Monerae ? of frogs, *Megastoma entericum*, *Trichomonas melolonthæ*, *Paramecioides costatus*, *Trypanosoma sanguinis*, young ?, spores of the *Coccidium* of *Coronella*, *Coccidium rivolta*, *Amœba coli*, *A. chætognathi*, *A. pigmentifera*.

Gruber, A. Untersuchungen über einige Protozoen. Z. wiss. Zool. xxxviii. pp. 45–70, pls. ii.–iv. [*Cf.* Ann. N. H. (5) xi. pp. 266–276 & 315–326, pl. xiii., and J. R. Micr. Soc. (2) iii. pp. 222 & 223.]

Pachymyxa hystrix, g. & sp. nn., *Amœba obtecta*, sp. n., *Spongomonas guttula*, sp. n., *Stichotricha urnula*, sp. n. Describes fusion in *Actinophrys sol*, and discusses the function of the nucleus generally.

Lankester, E. Ray. Review of Saville-Kent's Manual, in Nature, xxvii. pp. 601–603.

Parietti, E. Intorno ai Protisti della Valtravaglia. Boll. scient. iv. pp. 105–112.

Parona, Corrado. Di alcuni nuovi Protisti riscontrati nelle acque della Sardegna, e di due altre forme non ben conosciute. Atti Soc. Ital. xxvi. pp. 149, pl. iv.A. (Boll. scient. v. pp. 45–47, &c.)

Diplodorina massoni, From., a redescription; *Zigoselmis leucoa*, From.; *Amœba digitata*, sp. n., fresh-water, Cagliari; *A. velata*, sp. n., from a silver mine, Fonni; *Acineta linguifera*, C. & L., var. n. *interrupta*, salt pools,

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GRASSI, L. Sur quelques Protistes endoparasites appartenant aux classes des *Flagellata*, *Lobosa*, *Sporozoa*, et *Ciliata*. Arch. Ital. Biol. ii. [1882] pp. 402-444; iii. pp. 23–37, pls. i.–iv. [*Cf.* J. R. Micr. Soc. (2) iii. pp. 673–675.]

Class *Flagellata* : 5 fams., viz., (1) *Cercomonas*, Duj., pt., including *Monocercomonas*, Grassi, *M. insectorum*, sp. n. (= *Schedoacercomonas melo-*

lonthæ and *S. gryllotalpæ*, Grassi), *Cimænomonas*, g. n., *Plagiomonas*, g. n. (based on *Retortomonas gryllotalpæ*, Grassi), *Monomita*, g. n., *Heteromita* and *Dicercomonas*, Duj., *D. muris*, sp. n. (from *Mus* and *Arvicola*); (2) *Megastomidea*, fam. n., type *Dimorphus muris*, Grassi (from 4 spp. of *Mus*, *Arvicola*, the cat, and man); (3) *Lophomonadidea*, type *Lophomonas blattarum*, Stein; (4) *Trichomonadidea*, fam. n., for *Trichomonas melolonthæ*, Grassi; (5) *Trypanosomata*, Kent, includes *Trypanosoma* and *Paramecioides*, Grassi (containing *T. eberthi*, Kent, and *P. costatus*, sp. n., from blood of *Rana esculenta*). Class *Lobosa*: *Amœba coli*, Lösch., *A. muris*, sp. n. (from rats and mice), *A. ranarum*, Grassi, may be related to the associated *Paramecioides costatus*, sp. n., *A. chætognathi* (= *A. sagittæ*, Grassi) and *A. pigmentifera*, spp. nn., both from the 6 species of *Chætognatha* of the Straits of Messina. Class *Sporozoa*: *Coccidium rivolta*, sp. n. (from intestine of cat), ? sp. n. of *Coccidium* from a *Coronella*, *Moneron* from blood of *Hyla viridis*, &c.

The author combats Cunningham's views on Monocercomonads and *Amœbæ* of man, and groups the association or symbiosis of living forms under three heads: (1) Reciprocal advantage, he terms alliance (consorzio), mutualism of Van Beneden; (2) harmless association, he calls, with Van Beneden, commensalism; (3) advantage to one, harmful to the other, is parasitism. After drawing some medical conclusions, he concludes by stating: (1) Certain *Amœbæ* undergo a cycle comparable with that of *Protomyxa aurantiaca*; (2) the present classification of Flagellates should be reformed; (3) certain kinds of *Protistæ* (Coccids) are not properly determinable without a knowledge of their development. The plates illustrate *Monocercomonas hominis*, *M. insectorum*, *Heteromita lacertæ*, *Cimænomonas batrachorum*, *Monomita muscarum*, *Plagiomonas gryllotalpæ*, *Heteromita ? caviæ*, the Moneræ ? of frogs, *Megastoma entericum*, *Trichomonas melolonthæ*, *Paramecioides costatus*, *Trypanosoma sanguinis*, young ?, spores of the *Coccidium* of *Coronella*, *Coccidium rivolta*, *Amœba coli*, *A. chætognathi*, *A. pigmentifera*.

Gruber, A. Untersuchungen über einige Protozoen. Z. wiss. Zool. xxxviii. pp. 45–70, pls. ii.–iv. [*Cf.* Ann. N. H. (5) xi. pp. 266–276 & 315–326, pl. xiii., and J. R. Micr. Soc. (2) iii. pp. 222 & 223.]

Pachymyxa hystrix, g. & sp. nn., *Amœba obtecta*, sp. n., *Spongomonas guttula*, sp. n., *Stichotricha urnula*, sp. n. Describes fusion in *Actinophrys sol*, and discusses the function of the nucleus generally.

Lankester, E. Ray. Review of Saville-Kent's Manual, in Nature, xxvii. pp. 601–603.

Parietti, E. Intorno ai Protisti della Valtravaglia. Boll. scient. iv. pp. 105–112.

Parona, Corrado. Di alcuni nuovi Protisti riscontrati nelle acque della Sardegna, e di due altre forme non ben conosciute. Atti Soc. Ital. xxvi. pp. 149, pl. iv.A. (Boll. scient. v. pp. 45–47, &c.)

Diplodorina massoni, From., a redescription; *Zigoselmis leucoa*, From.; *Amœba digitata*, sp. n., fresh-water, Cagliari; *A. velata*, sp. n., from a silver mine, Fonni; *Acineta linguifera*, C. & L., var. n. *interrupta*, salt pools,

CATTANEO, GIAC. Fissazione, colorazione e conservazione degli Infusorii. Boll. scient. v. pp. 89–95.

FOL, H. [see *Ciliata*] employs perchloride of iron for preserving *Infusoria*, &c.

GILLIATT, H., P. Linn. Soc. N. S. W. viii., p. 383, and KELLICOTT, D. S., Bull. Buff. Nat. Club, i. p. 110, criticise Waddington's paper.

MAGGI, LEOP. Tecnica protistologica. Cloruro di Palladio. Boll. scient. v. pp. 48–51.

MÖBIUS, K. Kleine Mittheilungen aus der zoologischen Technik. Zool. Anz. vi. p. 53.

PARIETTI, E. Richerce relative alla preparazione e conservazione di Bacteri e d'Infusori. Boll. scient. v. pp. 95 & 96.

WADDINGTON, H. J. The Action of Tannin on the Cilia of *Infusoria*, with remarks on the use of Solution of Sulphurous Oxide in Alcohol. J.R. Micr. Soc. (2) iii. p. 185.

MONERA.

ENGELMANN, T. W. *Vampyrella helioproteus*, een nieuw Moneer. Bot. Centralbl. xiii. p. 214, and Verh. Ak. Amst. 1882–83, pp. 3 & 4.

Vampyrella helioproteus, sp. n., among confervæ, near Utrecht, one-stage "*Heliozoa* form," another discoid *Amœba*-form creeping without change of form. [*Cf.* J. R. Micr. Soc. (2) iii. p. 380.]

RHIZOPODA.

BRADY, H. B. Note on *Syringammina*, a New Type of Arenaceous *Rhizopoda*. P. R. Soc. xxxv. pp. 155–161, pls. ii. & iii.

Syringammina fragilissima, g. & sp. nn. Test consisting of a rounded mass of branching, inosculating, unequal tubes; walls very fragile, composed of fine sand; diameter, 1½ inch. N. of the Hebrides, 500 fath.

CARPENTER, W. B. Report on the Species of the Genus *Orbitolites* collected by H.M.S. 'Challenger' during the years 1873–76. 'Challenger' Reports, No. vii., 47 pp., 8 pls., 7 woodcuts.

Consisting of an introduction, description of genus and species, and a concluding summary, with a study of the theory of descent. The following are described and figured:—*Orbitolites tenuissima*, Carp., *O. marginalis*, Lam., *O. duplex*, sp. n. (= *A. hemprichi*, Ehr.), *O. complanata*, Lam.

——. Researches on the *Foraminifera*. Supplemental Memoir. On an Abyssal Type of the Genus *Orbitolites*, a Study in the Theory of Descent. Phil. Tr. clxxiv. pp. 551–571, pls. xxvii. & xxviii., 7 woodcuts, and P. R. Soc. xxxv. pp. 276–279. (Abstract.)

A supplement to former studies on the evolution of the genus *Orbitolites*. A new form (*Orbitolites tenuissima*, sp. n.), dredged from 1500

fath. in the 'Porcupine' expedition of 1869, illustrates in the adult state those stages in the evolution of the genus which Carpenter had formerly deduced but not proved. The primordial chamber extends into a closely-coiled tube like *Cornuspira*; then shows incipient septation similar to *Spiroloculina*; then flattens and becomes camerated as a *Penoroplis*; next, chambers subdivide, converting it into an *Orbiculina*; and, finally, it assumes the cyclical plan of growth characteristic of *Orbitolites*. The development of this Foraminifer serves as a text for a discourse on natural selection.

Fol, H. Sur le *Stilolonche zanclea*, et un nouvel ordre de Rhizopodes. Mém. Inst. Genév. xv. pp. 3–35, pls. i. & ii. [*Cf.* J. R. Micr. Soc. (2) iv. p. 73.]

A detailed account of *Stilolonche zanclea*, R. Hertwig; regards it as forming a new Order of *Rhizopoda*, the *Taxopoda*.

Foulke, [Miss] S. G. Observations on *Actinosphærium eichhorni*. P. Ac. Philad. 1883, pp. 125 & 126. [*Cf.* Ann. N. H. (5) xii. pp. 206–208, and J. R. Micr. Soc. (2) iii. pp. 669–671.]

Four *Actinosphæria* were seen to fuse; in an hour, two separated off. The remaining mass shortly ejected globules and granules. The former emitted a very long filament and others at long intervals, and a minute *Actinosphærium* was formed. This process took from seven to fourteen days.

Gruber, A. Ueber Kerntheilungsvorgänge bei einigen Protozoen. Z. wiss. Zool. xxxviii. pp. 372–391, pl. xix. [*Cf.* J. R. Micr. Soc. (2) iii. pp. 668 & 669.]

Observed fission of *Actinosphærium eichhorni* in a small specimen; the process takes place with great rapidity, without leaving any traces. Fission and behaviour of nucleus in *Amœbæ*.

Häckel, E. Über die Ordnungen der Radiolarien. SB. Jen. Ges., translated in Nature, xxix. pp. 274–276 & 296–299.

This paper gives an account of Häckel's latest views of the classification of the *Radiolaria*. In 1881, he distinguished 7 Orders and 2000 new species from the 'Challenger' collection. This number has since been considerably increased, and, as a result, the further knowledge thus obtained has enabled him to simplify his views, and reduce the number of Orders from seven to four—(1) *Acantharia*, (2) *Spumellaria*, (3) *Nassellaria*, (4) *Phæodaria*. For each of these he recognizes an "ancestral form," respectively—(1) *Actinelius*, (2) *Actissa*, (3) *Cystidium*, (4) *Phæodina*. The first, third, and fourth of these may readily be derived from the second. The author says, "Whilst, on the one hand, the simplest *Spumellaria*-form, *Actissa*, may be easily accepted as the ancestral form of all *Radiolaria*, *Actinosphærium* and *Actinophrys* show, on the other hand, how it may be derived from the simplest *Rhizopoda*." The paper commences with a brief historical review of the various classificatory systems of the group by different authors. His 4 Orders are next proposed and discussed; a systematic survey of the 4 Orders, 10 sub-orders, and 32 families follows; and the paper concludes with tables of the

differential characters of the 4 Orders of *Radiolaria*, a "Conspectus Ordinum et Familiarum Radiolarium classis," and a hypothetical ancestral tree for the *Radiolaria* (1882).

Leidy, J. A Social Heliozoon. P. Ac. Philad. 1883, pp. 95 & 96. [*Cf.* Ann. N. H. (5) xii. pp. 202 & 210, and J. R. Micr. Soc. (2) iii. p. 528.]

Rhaphidiophrys socialis, sp. n., from Lake Hopatcong, N. J. One group, 0.84 mm. × 0.36 mm., contained over a hundred individuals.

——. On *Actinosphærium eichhorni*. Abstract, Ann. N. H. (5) xi. p. 296. [*Cf.* Zool. Rec. xix. *Prot.* p. 12.]

Munier-Chalmas, E., & Schlumberger, C. Nouvelles observations sur le dimorphisme des Foraminifères. C.R. xcvi. pp. 862–866, 4 figs., & pp. 1598–1601, 4 figs. [*Cf.* Ann. N. H. (5) xi. pp. 336–341, with figs., & xii. pp. 67–69, and J. R. Micr. Soc. (2) iii. pp. 380 & 671.]

Having previously described dimorphism in the *Nummulitidæ*, the authors now find it in the *Miliolidæ*, there being a difference in size and arrangement of the primary chamber. In the latter paper, they show that the same occurs in all the extinct species they have examined.

Roboz, Z. v. *Calcituba polymorpha*, g. & sp. nn. SB. Ak. Wien, lxxxviii. Abth. 1, pp. 421–432, 1 pl., and Anz. Ak. Wien, xiv. pp. 117 & 118.

Schlumberger, C. Remarks upon a Species of *Cristellaria* (? *rotulata*). J. Cincinn. Soc. v. p. 119.

Shacko, G. Untersuchungen an Foraminiferen. Arch. f. Nat. xlix. pp. 428–454, 2 pls. [*Cf.* J. R. Micr. Soc. (2) ii. p. 74.]

Shacko regards the large spheres (parasitic *Algæ*, Moseley; cell nuclei, Lankester) in *Orbulinæ* from Cape de Verde, as embryonic chambers; he found some *Orbulinæ* from Miocene of Lapugy covered with *Globigerinæ*; and gives an account of the perforations and embryos of *Peneroplis proteus*.

[*Cf.* The General Subject.]

FLAGELLATA.

Buck, E. Kleiner Beitrag zur Kenntniss der Euglenen. Ber. offenb. Ver. 1883, pp. 233–235, 1 pl.

Bütschli, O. *Protozoa*. Bronn's Klassen und Ordnungen des Thierreichs, pts. 20–25, pp. 617–784, pls. xxxix.–l.

Bütschli commences the *Mastigophora* (*Flagellata*), and makes 4 Orders—(1) *Flagellata*, (2) *Choano-flagellata*, (3) *Cysto-flagellata*, (4) *Ciliio-flagellata*. No further classification given. The following sections are employed:—1. Historical (p. 620); 2. Literature (p. 650); 3. General Morphology (p. 658); 4. Special Morphology (p. 659); 5. Minute Structure of Soft Parts (p. 671); 6. Reproduction (p. 744).

Certes, A. Sur le *Trypanosoma balbianii* (Note complémentaire). Bull. Soc. Z. Fr. viii. pp. 209 & 210. [*Cf.* J. R. Micr. Soc. (2) iii. pp. 862 & 863.]

The only difference between Mitrophanow's two spp. nn. (*infrâ*)

and *Trypanosoma balbianii* appears to lie in their possession of a long flagellum.

Henneguy, L. F. Sur un Infusoire flagellé, ectoparasite des Poissons. C.R. xcvi. pp. 658–660. [*Cf.* Ann. N. H. (5) xi. pp. 293 & 294, and J. R. Micr. Soc. (2) iii. p. 379.]

Bodo necator, sp. n., on young trout.

Imhof, O. E. Zool. Anz. vi. pp. 655–657.

Dinobryon cylindricum, sp. n., Lake Bourget, Savoy.

Klebs, G. Ueber die Organisation einiger Flagellatengruppen und ihre Beziehungen zu Algen und Infusorien. Unters. Bot. Inst. Tübingen, i., 13 pp., 2 pls., and Bot. Ztg. 1883, p. 595. [*Cf.* J. R. Micr. Soc. (2) iv. pp. 68 & 69.]

A discussion on the classification and relationships of the *Flagellata*. Part 1. Monograph of the *Euglenaceæ*; Part 2. Some *Flagellatæ*, in the old sense of the term, belonging to the lower chlorophyllaceous *Algæ*; Part 3. The fresh-water *Peridineæ*. Dr. Klebs attacks the problem of the relationships of the *Flagellata*, classing *Euglena*, *Trachelomonas*, *Colacium*, *Ascoglena* (*Euglenida*, Stein), *Entreptia*, *Phacus*, *Astasia*, *Rhabdomonas*, and *Menoidium*, as *Euglenaceæ*. He considers the colourless forms as derived from the green, and as tending towards other *Flagellata*. The relationship of the *Euglenaceæ* with the *Peranemeæ* and *Algæ* is discussed. As true *Algæ*, the groups *Pleurococcæ*, *Chlorosphæraceæ*, *Tetrasporæ*, *Chlamydomonadæ*, *Volvocineæ*, *Endospharaceæ*, *Characieæ*, and *Hydrodictyeæ* are associated under the name *Protococcoideæ*. The *Peridineæ* are regarded as *Algæ*, the fresh-water forms being fully recorded. Klebs's *Flagellata* contain the *Euglenaceæ* and the *Peranemeæ*, and are allied to the *Infusoria*, and at the same time connected with the *Algæ*, *Vampyrellæ*, Rhizopod-like organisms, *Noctilucæ*, &c.

Krassilstchik, —. Zapiski Novoros. Obsch. Estestv. viii. [*Cf.* Nature, xxix. p. 273, and J. R. Micr. Soc. (2) iii. pp. 521 & 522.]

An elaborate paper on the development of *Polytoma* (*P. spicatum* and *P. uvella*), and the place it occupies with regard to other *Flagellata*.

Künstler, E. Réponse à O. Bütschli. Zool. Anz. vi. p. 168.

Admits that *Kuenckelia gyrans*, Künstl., is probably the larva of a Metazoon, but not a well-known Cercaria-larva.

——, G. Recherches sur les Infusoires parasites. Sur quinze Protozaires nouveaux. C.R. xcvii. pp. 755–757. [*Cf.* J. R. Micr. Soc. (2) iv. p. 67.]

Describes *Trichomonas vaginalis*, Donné, and a parasite allied to *Giardia agilis*, Künstl. (from tortoise), and *Heteromita* (*Boda*, sic) *lacertæ*, sp. n. (from *Lacerta viridis*), and records but does not describe parasitic *Flagellata* from the tortoise, *Lacerta viridis*, *Hydrophilus* (and an *Amœba*), larvæ of *Tipulæ*, larva of *Rhizotrogus*, *Toxopneustes lividus*, *Dytiscus*, &c.; *Nyctotherus* from larva of *Oryctes nasicornis*; and *Trypanosoma* from blood of *Cavia*.

MILNE, W. On some new *Infusoria*. P. Phil. Soc. Glasg. xiv. pp. 32–36, pl. i.

Tetramitus gyrans, sp. n, *Hexamita kenti*, sp. n., *Longicilium flexicuneus*, g. & sp. nn., *Tillina barbata*, sp. n., all from brackish water, Glasgow.

MITROPHANOW, P. Beiträge zur Kenntniss der Hämatozoen. Biol. Centralbl. iii. pp. 35–44. [*Cf.* J. R. Micr. Soc. (2) iii. p. 381.]

Hæmatomonas cobitis and *H. carassii*, g. & spp. nn., from blood of *Cobitis fossilis* and of *Carassius vulgaris* respectively (with woodcuts).

MÖBIUS, K. *Trypanosoma balbianii*, Certes, im Krystallstiel schleswig-holsteinischer Austern. Zool. Anz. vi. p. 148.

PELLETAN, J. Note sur la reproduction du *Dinobryon stipitatum*. J. Microgr. vii. pp. 77–80, with fig.

POUCHET, G. Contributions à l'histoire des Cilio-flagellés. J. de l'Anat. Phys. xix. pp. 399–455, pls. xix.–xxii., 12 figs. [*Cf.* J. R. Micr. Soc. (2) iv. p. 72.]

The author discusses the various methods of reproduction within the group; these "would suggest very great differences in the group, which seems, however, to be so homogenous and so natural." He regards the *Noctilucæ* as *Cilio-flagellatæ*. A number of new forms are described, but on account of the very imperfect state of our knowledge, the author hesitates to name most of them as new species, regarding them for the present as varieties in "specific groups." Besides the following, a number of varieties of named species are described, some being named, others called A, B, C, &c.:—*Dinophysis galea*, sp. n., *Protoperidinium ovatum*, *P. digitale*, *P. pyrophorum*, spp. nn., *Peridinium poly[h]edricum*, sp. n., *Glenodinium lenticula*, *G. sphæra*, *G. turbo*, with vars. A, B, C, *G. obliquum*, spp. nn., *Gymnodinium archimedis*, sp. n. The following are figured:—*Ceratium furca* and var., *C. tripos* and varr. nn. *reticulatum*, *limulus*, *Dimophysis acuta*, Berg, *D. lævis*, B., *Amphidinium operculatum*, C. & L., and var., *Protoperidinium pellucidum*, B., vars., *P. ovatum*, *P. digitale*, *P. pyrophorum*, spp. nn., *Peridinium divergens*, B., varr. nn. *reniforme*, *depressa*, &c., *P. poly[h]edricum*, sp. n., *Glenodinium cinctum*, Müll., *G. obliquum*, *G. turbo*, and varr., spp. nn., *G. gracile*, B., and var. n. *exigua*.

RYDER, J. A. The Protozoan Parasites of the Oyster. Science, i. pp. 567 & 568.

Mainly a review of Certes's paper on the same subject. [*Cf.* Zool. Rec. xix. *Prot.* p. 11.]

SCHMANKEVITCH, W. J. Zapiski Novoros. Obsch. Estestv. vii. [*Cf.* Nature, xxix. p. 274, from which this account is taken, and J. R. Micr. Soc. (2) iv. pp. 69 & 70.]

Anisonema acinus, Bütschli (= *A. grande*, Ehrbg.), was cultivated for many generations in water which was gradually rendered saline. The individuals became less developed, and a number of intermediate stages were passed through, till the form known as *Anisonema sulcatum* (*Entosiphon sulcatus*, Duj.) was arrived at. When change of temperature accompanied the concentration, the lowest *Anisonemæ* are transformed on

the one side into *Alga*-like organisms, and in another direction into organisms which seem to belong to the category of fungi. Under the influence of the sun's rays, the uncoloured *Flagellata* develop chlorophyll. "We see thus the beginnings of two kingdoms, animal and vegetable, radiating from one common stem. We see the transformation of one of them into the other, not only in its morphological features, but also in its physiological functions, under the direct influence of physical and chemical agencies." New Members of the Infusorial Order.

Stein, F. von. Der Organismus der Infusionsthiere. iii. Abth., ii. Hälfte, Der Organismus der Arthrodelen Flagellaten. Leipzig: 1883, 30 pp., 25 pls. [*Cf.* J. R. Micr. Soc. (2) iv. pp. 70–72.]

The present part does not complete the genera and species from the first half of pt. ii., but constitues a monograph of a suborder of the *Flagellata*. The *Flagellata* are divided into two suborders: (1) The *Monero-flagellata*, described in the first part; (2) The *Arthrodelo-flagellata*, now described: these are practically the *Cilio-flagellata*, which term Stein discards. He distinguishes 5 families: (1) *Prorocentrinidæ—Prorocentrum*, Ehrbg., *Dinopyxis*, g. n., *Cenchridium*, Ehrbg.; (2) *Cladopyxida—Cladopyxis*, g. n.; (3) *Peridinidæ—Gymnodinium*, g. n., *Hemidinium*, g. n., *Glenodinium*, Ehrbg., *Clathrocysta*, *Heterocapsa*, *Amphidoma*, *Oxytoxum*, *Pyrgidium*, *Ceratocorys*, *Goniodoma*, gg. nn., *Gonyaulax*, Dies., *Blepharocysta*, Ehrbg., *Podolampas*, g. n., *Diplopsalis*, Bergh, *Peridinium*, Ehrbg., *Ceratium*, Schrk.; (4) *Dinophysidæ—Amphidinium*, C. L., *Phalacroma*, g. n,, *Dinophysis*, Ehrbg., *Amphisolenia*, *Citharistes*, *Histioneis*, *Ornithocercus*, gg. nn.; (5) *Noctilucidæ—Ptychodiscus*, *Pyrophacus*, gg. nn., *Noctiluca*, Surir.

The following are described and figured:—*Prorocentrum micans*, Ehrbg., *P. dentatum*, sp. n., *P. rostratum*, sp. n.; *Dinopyxis dactylus*, g. & sp. nn., *D. vaginula*, sp. n., *D. lævis*, sp. n., *D. compressa*, Bail. (= *Pyxidicola compressa*, Baily, erroneously considered as a Diatom); *Cenchridium* [= *Cenchridium*, Ehrbg., and *Entosolenia*, Williamson, Stein considering it to be a Flagellate and not a Foraminifer !] *globosum*, Will., *C. sphærula*, Ehrbg., *C. rugulosum*, *C. tridactylum*; *Cladopyxis* (Ehrenberg's *Xanthidium* from Iflint) *brachiolata*, g. & sp. nn.; *Gymnodinium*, g. n., *G. fuscum*, Ehrbg., *G. æruginosum*, *G. vorticella*, spp. nn.; *Hemidinium nasutum*, g. & sp. nn.; *Glenodinium oculatum*, sp. n., *G. pulvisculus*, Ehrbg., *G. cinctum*, Ehrbg., *G. foliaceum*, sp. n., *G. trochoideum*; *Heterocapsa*, g. n., *H. triquetra*, Ehrbg., *H. umbilicata*, sp. n., *H. quadridentata*, sp. n.; *Clathrocysta aculeata*, g. & spp. nn.; *Gonyaulax poly*[*h*]*edra*, sp. n., *G. spinifera*, C. & L., *G. polygramma*, sp. n., *G. birostris*, sp. n.; *Amphidoma nucula*, g. & sp. nn., *A. acuminata*, sp. n.; *Oxytoxum scolopax*, g. & sp. nn., *O. cribosum*, *O. diploconus*, sp. n., *O. gladiolus*, sp. n., *O. sphæroideum*, sp. n.; *Pyrgidium reticulatum*, g. & sp. nn., *P. constrictum*, sp. n., *P. sceptrum*, sp. n., *P. mitra*, sp. n., *P. tessellatum*, sp. n.; *Ceratocorys horrida*, g. & sp. nn.; *Goniodoma*, g. n., *G. acuminatum*, Ehrbg.; *Blepharocysta splendor-maris*, Ehrbg.; *Podolampas bipes*, g. & sp. nn., *P. palmipes*, sp. n.; *Diplopsalis lenticula*, Bergh; *Peridinium globulus*, sp. n., *P. michaelis*, Ehrbg., *P. tristylum*, sp. n., *P. divergens*, C. & L., *P.*

quadridens, sp. n., *P. bipes*, sp. n., *P. tabulatum*, C. & L., *P. umbonatum*, sp. n., *P. cinctum*, Ehrbg.; *Ceratinum cornutum*, C. & L., *C. macroceros*, Schrank, Perty, *C. fusus*, Duj., *C. furca*, Duj., *C. candelabrum*, Ehrbg., *C. tripos*, O. F. Müll.; *Amphidinium operculatum*, C. & L., *A. lacustre*, sp. n.; *Phalacroma nasutum*, g. & sp. nn., *P. operculatum*, sp. n., *P. porodictyum*, sp. n., *P. argus*, sp. n., *P. doryphorum*, sp. n., *P. rapa*, sp. n.; *Dinophysis rotundata*, C. & L., *D. hastata*, sp. n., *D. acuta*, Ehrbg., *D. sphærica*, sp. n., *D. sacculus*, sp. n., *D. uracantha*, sp. n., *D. homunculus*, sp. n.; *Amphisolenia palmata*, g. & sp. nn., *A. globifera*, sp. n.; *Citharistes regius*, g. & sp. nn.; *Histioneis crateriformis*, g. & sp. nn., *H. cymbalaria*, sp. n., *H. remora*, sp. n., *H. megalocopa*, sp. n., *H. biremis*, sp. n.; *Ornithocercus magnificus*, g. & sp. nn.; *Ptychodiscus noctiluca*, g. & sp. nn.; *Pyrophacus horologium*, sp. n.; *Noctiluca miliaris*, Surir.

STOKES, A. C. *Choano-flagellata*, S. K. Am. Micr. J. iv. pp. 204–208, figs.

Monosiga robusta, sp. n., *M. woodiæ*, sp. n., *M. longipes*, sp. n., *Codosiga dichotoma*, sp. n., *C. longipes*, sp. n., *Salpingœca acuminata*, sp. n.

——. *Phalansterium digitatum*, Stein. Science, ii. p. 496.

From Trenton, N.J., first American locality.

[*Cf.* THE GENERAL SUBJECT.]

CILIATA.

ENTZ, C. Beiträge zur Kenntniss der Infusorien. Z. wiss. Zool. xxxviii. pp. 167–189, pl. viii. [*Cf.* J. R. Micr. Soc. (2) iii. p. 520.]

Describes *Actinolobus radians*, Stein; compares *Mesodinium acarus*, Stein, and *Didinium nasutum*, Stein, with *Urocentrum turbo*, Ehrbg.; and discusses the systematic position of the *Enchelinæ*. Entz holds that characters other than cilia should be studied in taxonomy, such as absence or presence of mouth, characters of peristome, position of anus, contractile vacuole, &c.

FOL, H. Nouvelle contribution à la connaissance de la famille des *Tintinnodea*. Arch. Sci. Nat. ix. pp. 554–578, 1 pl.

From renewed investigations, Fol regards the *Tintinnodeæ* as a single family. An account is given of the anatomy and classification of the group. The following are figured:—*Tintinnus ampulla*, auctt., *Cyattarocylis cistellula*, sp. n., *Dictyocysta templum*, Häck., *Codonella campanula*, Ehrbg., *C. ventricosa*, C. & L., *C. nucula*, sp. n., *C. galea*, Häck., all from Villafranca. [*Cf.* Ann. N. H. (5) xii. pp. 73–87, pl. iv., and J. R. Micr. Soc. (2) iii. p. 729.]

GRUBER, A. Beobachtungen an *Chilodon curvidentis*, sp. n. Fest. d. 56 Versamm. d. Nat. v. d. Nat. Ges. in Freiburg, 11 pp., 1 pl.

KELLICOTT, D. S. Bull. Buff. Nat. Club, i. pp. 112–116 (6 figs.); P. Am. Micr. Soc. vi. pp. 105–111 (6 figs.).

Cothurnia variabilis, sp. n., on the American crayfish; *Epistylis niagara*, sp. n., on the crayfish of Niagara.

[Kellicott, D. S.]. *Cothurina lata*. Chicago Times, Aug. 11th 1883; in advance of P. Am. Soc. Micr., 6th Ann. Meeting. [*Cf.* J. R. Micr. Soc. (2) iii. p. 668.]

Cothurnia lata, sp. n., attached to a species of *Diaptomus*.

Kowalewski, A. Beiträge zur Naturgeschichte der Oxytrichinen. Biol. Centralbl. iii. p. 235. [*Cf.* Zool. Rec. xix. *Prot.* p. 8.]

An important monograph, with several new genera and species.

Mérejkowsky, —. Sur les Infusoires suctociliés. C.R. xcvi. pp. 276–279.

Replies to Maupas, and maintains the group of *Suctocilia*, Mérej.

Maupas, E. Sur les Infusoires suctociliés de M. de Mérejkowsky. C.R. xcvi. pp. 516–518.

A second reply on this subject [see 1882].

——. Contribution à l'étude morphologique et anatomique des Infusoires Ciliés. Arch. Z. expér. 1883, pp. 427–664, pls. xix.–xxiv.

All the following are fully described and figured :—*Colpoda cucullus*, O. F. Müll., *C. steini*, sp. n. (*C. cucullus*, pt.) ; *Cryptochilum*, g. n., *C. nigricans*, O. F. Müll., *C. elegans*, sp. n., *C. griseolum*, Perty, *C. tortum*, sp. n. ; *C. echini*, sp. n., *Colpidium colpoda*, Stein; *Glaucoma pyriforme*, Ehrbg., *G. scintillans*, Ehrbg.; *Ophryoglena magna*, sp. n. ; *Ptychostomum sanuridis*, Stein ; *Ancistrum*, g. n., *A. mytili*, Quenn., *A. veneris-gallinæ*, sp. n.; *Nassula oblonga*, sp. n. ; *Chilodon dubius*, sp. n. ; *Holophrya oblonga*, sp. n.; *Lagynus crassicollis*, sp. n., *L. elongatus*, C. & L. ; *Lacrymaria coronata*, C. & L. ; *Loxophyllum duplo-striatum*, sp. n., *L. lamella*, O. F. Müll.; *Acineria incurvata*, Duj.; *Peritromus emmæ*, Stein ; *Condylostoma patens*, Müll.; *Actinotricha saltans*, Cohn ; *Gonostomum pediculiforme*, Cohn ; *Holosticha lacazii*, sp. n., *H. multinucleata*, sp. n. ; *Uroleptus roscovianus*, sp. n. The author concludes with a full account of the anatomy and discussion of the morphology of the group, criticising the views of Häckel and others. He proposes to substitute the terms *Cytozoa* and *Histozoa* for *Protozoa* and *Metazoa*.

McMurrich, J. P. Notes on some Canadian *Infusoria*. P. Canad. Inst. (n.s.) i. pp. 300-309, 1 pl.

Parker, A. S. Reproduction in *Amphileptus fasciola*. P. Ac. Philad. 1883, pp. 313 & 314.

An *Amphileptus fasciola* was observed to rock from side to side, the animal remaining stationary. The elongated extremity broke up into small amœboid masses, the cilia being absorbed in the process. Nothing is known of their subsequent fate. In two hours, the parent resumes its normal forms and habits. This "reproduction by partial dissociation" appears to be an undescribed method of reproduction amongst the *Infusoria*.

Phillips, F. W. On a New Peritrichous Infusorian (*Gerda caudata*). J. L. S. xvii. pp. 293–295, with woodcut. [*Cf.* J. R. Micr. Soc. (2) iii. p. 861.]

Gerda (*Vorticellina*) *caudata*, sp. n., pond at Hertford Heath.

Stokes, A. C. A New *Vorticella*. Am. Micr. J. iv. p. 208.

Vorticella vestita, sp. n. [*Cf.* J. R. Micr. Soc. (2) iv. p. 68.]

[*Cf.* The General Subject.]

GREGARINIDA.

Balbiani, E. G. Leçons sur les Sporozoaires. Paris: 1884 [published in Nov. 1883], 8vo, pp. viii. & 148, 52 cuts, 5 pls.

Flesch, Max. Ueber ein Sporozoon beim Pferde. Zool. Anz. vi. pp. 396 & 397.

Globidium leuckarti, g. & sp. nn.

Schneider, A. Nouvelles observations sur la sporulation du *Klossia octopiana*. Arch. Z. expér. (2) i. pp. 77–104, 2 pls.

——. *Ophryocystis buetschlii*. C.R. xcvi. p. 1378.

Ophryocystis buetschlii, g. & sp. nn., in Malpighian tubules of *Blaps*. General form of an *Amœba*, with 1–10 nucleolated nuclei. Two round mono-nucleated forms conjugate and encyst. Each nucleus divides into three; of these six, two take part in the formation of one large spore, remainder dissolve. [*Cf.* Ann. N. H. (5) xi. p. 459, and J. R. Micr. Soc. (2) iii. p. 522.]

——. Développement du *Stylorhynchus*. C.R xcvii. p. 1151.

The development of *Stylorrhynchus* chiefly takes place within an epithelial cell of its host. [*Cf.* J. R. Micr. Soc. (2) iv. p. 74.]

[*Cf.* The General Subject.]

Bernissartia, *Dollo*, Rept. 9
Bertinia, *Jousseaume*, Moll. 56
Betanga, *Moore*, Ins. 168
Bibisana „ „ 168
Blapticus, *Förster* [1871], Ins. 140
Borioikon [? Boreœcon], *Poliakoff*, Mamm. 38
Bothragonus, *Gill*, Pisc. 25
Bothriometopus, *Taschenberg*, Ins. 257
Bothrio[r]rhinus, *Fairmaire*, Ins. 110
Botrocionium, *Pocta*, Spong. 11
Boysidia [Boysioi-], *Ancey*, Moll. 80
Brachalletes, *De Vis*, Mamm. 57
Brachychara, *Sharp*, Ins. 46
Brachyclerus, *Fairmaire*, Ins. 83
Brachyidium, *Fairmaire*, Ins. 89 [-chidia, *Solier*, 1851, -ius, *Chaudoir*, 1852, Ins.]
Brachynemata, *Meyrick*, Ins. 233 [-nema, *Fieber*, Ins. 1861]
Brachysara, *Meyrick*, Ins. 231
Brachytherium, *Ameghino*, Mamm. 47
Bradynocerus, *Fairmaire*, Ins. 91
Brephoctonus, *Förster* [1871], Ins. 138
Brisingaster, *Loriol*, Ech. 5
Brugnonia, *Jeffreys*, Moll. 49
Burtonia, *Bourguignat*, Moll. 93
Byrsia ‖, *Pascoe*, Ins. 105 [*Walker*, Ins. 1864]
Bythinoplectus, *Reitter*, Ins. 54
Bythiospeum, *Bourguignat*, Moll. 47
Byturna, *Moore*, Ins. 210

Cabralia, *Moore*, Ins. 206
Cacerlaca, *Saussure* [1864], Ins. 271 [Kakerlac, *Latreille*, Ins. 1825]
Cacosyndya, *Kirby*, Ins. 152
Caduga, *Moore*, Ins. 168
Cadytis „ „ 167
Cænophanus ‖, *Broun*, Ins. 103 [-nes, *Förster*, Ins. 1862]
Cæranica, *Meyrick*, Ins. 233
Caillaudia, *Bourguignat*, Moll. 83
Calamocichla, *Sharpe*, Aves 25
Calamonastes „ „ 25
Calanoides, *Brady*, Crust. 26
Calathiscus, *Sollas*, Spong. 11
Calcituba, *Roboz*, Prot. 7
Calliæschna, *Selys*, Ins. 266
Callicistronia, *Dall*, Moll. 93
Callistenoma, *Butler*, Ins. 230
Camelonotus, *Fairmaire*, Ins. 69
Campsocrinus, *Miller*, Ech. 8
Cardiatherium [Cardio-], *Ameghino*, Mamm. 40
Carneades ‖, *Grote*, Ins. 206 [*Bates*, Ins. 1869]
Cartosyrphus, *Bigot*, Ins. 245
Catascythropus, *Kolbe*, Ins. 100
Catastenus, *Förster* [1871], Ins. 139
Catenina, *Burmeister*, Ins. 191
Catoessa, *Schiödte*, Crust. 23
Caulolepis, *Gill*, Pisc. 21
Cea ‖, *Grote*, Ins. 207 [*Walker*, Ins. 1837]
Cephalæschna, *Selys*, Ins. 266
Cephalissa, *Meyrick*, Ins. 216
Cephaloplectus, *Sharp*, Ins. 48
Cephalota, *Dokhtouroff*, Ins. 23 [-tes, *Geoffroy*, Mamm. 1810, *Bonelli*, Ins. 1813]
Ceratocorys, *Stein*, Prot. 10
Ceratolepis ‖, *Sars*, Crust. 18 [*Chapuis*, Ins. 1869]
Chalazacanthus, *Davis*, Pisc. 12
Chalcogenia ‖, *J. Thomson*, [1879], Ins. 73 [*Saunders*, Ins. 1871]
Chamæclea, *Grote*, Ins. 207
Chanapa, *Moore*, Ins. 168
Charmodia, *Möschler*, Ins. 210
Charoxus, *Sharp*, Ins. 45
Cheriaster, *Studer*, Ech. 5
Cheromettia, *Moore*, Ins. 196
Chersonesia, *Distant*, Ins. 174
Chilonyx ‖, *Cope*, Rept. 7 [Cheilonycha, *Lacordaire*, Col. 1842]
Chirosa, *Moore*, Ins. 168 [-sia, *Rondani*, Ins. 1856]
Chirox, *Cope*, Mamm. 58
Chitalia, *Sharp*, Ins. 45
Chitonodus, *St. John*, Pisc. 9
Chlamydolycus, *Bourgeois*, Ins. 79
Chloropachys, *Rey*, Ins. 115
Chronozoon, *De Vis*, Mamm. 52
Cimænomonas, *Grassi*, Prot. 2
Cinusa, *Schiödte*, Crust. 23
Citharistes, *Stein*, Prot. 10
Cladopyxis „ „ 10
Clathrocysta „ „ 10
Cleatessa, *Schiödte*, Crust. 22
Cleidopus [Cli-], *De Vis*, Pisc. 22
Clypeo[r]rhynchus, *Sharp*, Ins. 100
Cobanilla, *Moore*, Ins. 196
Cœliastes, *Weise*, Ins. 107
Cœsyra, *Meyrick*, Ins. 233 [Cœsira, *Savigny*, Moll. 1816]
Colaster, *Worthen*, Ech. 6
Coloceras, *Taschenberg*, Ins. 257
Comatopselaphus, *Schaufuss*, Ins. 54

Compsaster, *Worthen*, Ech. 6
Compsotropha, *Meyrick*, Ins. 233
Copimamestra, *Grote*, Ins. 206
Coptechinus, *Cotteau*, Ech. 5
Corizomorpha, *Jakovleff*, Ins. 280
Corynura ‖, *Brady*, Crust. 27 [*Spinola*, Ins. 1851]
Corythocichla, *Sharpe*, Aves 27
Coscinoderma, *Carter*, Spong. 8
Cossyphopsis, *Stejneger*, Aves 22
Cradibia [see Kradibia]
Craspedodon ‖, *Dollo*, Rept. 5 [-onta, *Küster*, *Clessin*, 1874, Moll.]
Crateroscelis, *Sharpe*, Aves 27
Cratoseris, *Tomes*, Cœl. 14
Cremnogenes, *Meyrick*, Ins. 233
Creontiades, *Distant*, Ins. 284
Crepidosceles, *Meyrick*, Ins. 233
Crepis, *Jullien*, Moll. 108
Cristigibba, *Tapp.-Canefri*, Moll. 73
Crossophora ‖, *Meyrick*, Ins. 233 [-rus, *Hemprich*, Verm. 1828]
Cryphiphorus, *Stierlin*, Ins. 98
Cryptaxis ‖, *Watson*, Moll. 56 [*Lowe*, Moll. 1854; *Reuss*, Cœl. 1865]
Cryptochilum ‖, *Maupas*, Prot. 12 [-lus, *Panzer*, Ins. 1806; -lon, *Gray*, Moll. 1847]
Cryptopsophis, *Boulenger*, Rept. 23
Cryptotrichus ‖, *Packard*, Myr. 7 [*Schaufuss*, Col. 1865]
Cterissa, *Schiödte*, Crust. 23
Cyclotropis, *Tapp.-Canefri*, Moll. 86
Cypselichthys, *Steindachner*, Pisc. 19
Cyptocephala, *Berg*, Ins. 279
Cyrtobolia, *Pocta*, Spong. 11
Cyrtocentrus, *Provancher*, Ins. 141
Cystodytes, *Drasche*, Moll. 103

Dactylophora, *De Vis*, Pisc. 21
Danisepa, *Moore*, Ins. 168
Dappula „ „ 194
Dasyspoudæa, *J. B. Smith*, Ins. 207
Daya, *Fauvel* [1878], Ins. 51
Deilotherium[Dilo-],*Filhol*,Mamm. 47
Deionosoma [Deino- on plate; *scribe* Dino-], *Westwood*, Ins. 61
Delocharis, *Butler*, Ins. 215
Deltodopsis, *St. John*, Pisc. 9
Democrinus, *Perrier*, Ech. 8
Dendrilla ‖, *Lendenfeld*, Spong. 8 [-drella, *Bory*, Prot. 1824]
Deragena, *Moore*, Ins. 168
Derophthalma, *Berg*, Ins. 285
Desmatotherium, *Scott*, Mamm. 42
Dialipsis, *Förster* [1871], Ins. 140
Diartiger, *Sharp*, Ins. 55
Diclitodus, *Davis*, Pisc. 12
Dicolus, *Förster* [1871], Ins. 140
Dicropterus ‖, *Ehlers*, Ins. 39 [-ra, *Rafinesque*, Moll. 1815]
Didemnoides, *Drasche*, Moll. 103
Didymodus, *Cope*, Pisc. 16
Didymophleps, *Weyenbergh*, Ins. 240
Digyreidium [Digyro-], *Letourneux*, Moll. 49
Dilophodon, *Scott*, Mamm. 42
Dinopyxis, *Stein*, Prot. 10
Diœdimorpha, *Brown*, Ins. 108
Dioplotherium, *Cope*, Mamm. 52
Dior[r]habda, *Weise*, Ins. 119
Diphilus, *Pascoe*, Ins. 105
Diphrontis, *Gerstäcker*, Ins. 71
Diplocheilus [-chilus] ‖, *Allman*, Cœl. 6 [-la, *Brullé*, Ins. 1835]
Diplocladon, *Gorham*, Ins. 81
Diploptera ‖, *Saussure* [1864], Ins. 271 [*Latreille*, Ins., as group, 1817; -rus, *Boie*, Aves, 1826, *Agassiz*, Pisc. 1835, *Gray*, Pisc. 1838; -ron, *Cuvier*, Pisc. 1839]
Diplosara, *Meyrick*, Ins. 230
Discoconulus, *Reinhardt*, Moll. 67
Discosaurus ‖, *Credner*, Rept. 24 [*Leidy*, Rept. 1851]
Disselia, *Meyrick*, Ins. 233
Distichoptilum, *Verrill*, Cœl. 15
Distyla ‖, *Eckstein*, Verm. 8 [-lia, *Quatrefages*, Verm. 1867]
Dodecas, *Stebbing*, Crust. 19
Dœderleinia, *Steindachner*, Pisc. 18
Donovania, *Bucquoy*, Moll. 44
Doricha ‖, *Moore*, Ins. 168 (*Reichenbach*, Aves, 1853]
Dorisia, *Möschler*, Ins. 195
Dorypteryx, *Aaron*, Ins. 261 [-rus, *Germar*, Pisc. 1842]
Drepanopus, *Brady*, Crust. 26
Drilophaga, *Vejdovsky*, Verm. 8
Dryadites, *Frivaldszky*, Ins. 122
Dryonastes, *Sharpe*, Aves 26
Duva, *Koren*, Cœl. 15
Dyscheres, *Pascoe*, Ins. 96 [-rus, *Chaudoir*, Ins. 1855]
Dysprosœstus, *Kolbe*, Ins. 102

Echinodiscus ‖, *Worthen*, Ech. 8 [*Breyn*, Ech. 1732]
Eclecta ‖, *Meyrick*, Ins. 230 [-tus, *Wagler*, 1832, *Bonaparte*, 1845, Aves; -tis, *Hübner*, Ins. 1816]

Ectinochila, *Chaudoir*, Ins. 32
Ectyonopsis, *Carter*, Spong. 8
Edaphosaurus, *Cope*, Rept. 24
Elisa ‖, *Heynemann*, Moll. 62 [*Reichenbach*, Aves, 1854; -sia, *Cantraine*, Moll. 1835]
Ellipsidium, *Saussure* [1864], Ins. 271
Ellipsoptera, *Dokhtouroff*, Ins. 23
Elthusa, *Schiödte*, Crust. 23
Emblemaria, *Jordan*, Pisc. 27
Emetha, *Schiödte*, Crust. 22
Emploca, *Sollas*, Spong. 11 [-cia, *Schaffer*, Ins. 1855]
Enchocrates, *Meyrick*, Ins. 230
Endytus, *Bedel*, Ins. 121
Eniaca, *Kirby*, Ins. 144
Enispa ‖, *Schiödte*, Crust. 23 [*Walker*, Ins. 1865; -pe, *Westwood*, Ins. 1850; -pia, *Pascoe*, Ins. 1864]
Entelechia, *Förster* [1871], Ins. 140
Entomodestes [Entomed-], *Stejneger*, Aves 24
Entypoma, *Förster* [1871], Ins. 140
Eochroa ‖, *Meyrick*, Ins. 230 [*Felder*, Ins. 1874]
Ephelis, *Fauvel* [1878], Ins. 51 [-lia, *Schiner*, Ins. 1853]
Ephymia, *Reitter*, Ins. 53
Epiæschna, *Selys*, Ins. 266
Epicrionops, *Boulenger*, Rept. 23
Epinæus, *Kirby*, Ins. 144
Epiphryne, *Meyrick*, Ins. 215
Epipyrga „ „ 233
Epischura, *Forbes*, Crust. 27
Epistomina, *Terquem*, Prot. 4
Epitelia, *Kirby*, Ins. 145
Epyaxa, *Meyrick*, Ins. 216
Eremiomys, *Poliakoff*, Mamm. 38
Eremochares, *Gribodo*, Ins. 132
Eriodyta, *Meyrick*, Ins. 233
Erythrocichla, *Sharpe*, Aves 27
Eucalathus, *Bates*, Ins. 38
Euchætis ‖, *Meyrick*, Ins. 230 [-tes, *Dejean*, 1834, *Harris*, 1841, *Leconte*, 1876, Ins.; *Sclater*, Aves, 1858; -ta, *Philippi*, Crust. 1843]
Euchætomera, *Sars*, Crust. 18
Euconulus, *Reinhardt*, Moll. 67
Eucopella, *Lendenfeld*, Cœl. 5
Eucorystes ‖, *Sclater*, Aves 31 [*Bell*, Crust. 1862]
Eudontus, *Brown*, Ins. 108
Euginoma, *Jullien*, Moll. 108
Eulachna, *Meyrick*, Ins. 233
Eulechria „ „ 231
Eulepiste, *Walsingham*, Ins. 229
Eumunida, *S. I. Smith*, Crust. 17
Eunemacanthus, *St. John*, Pisc. 10
Euphalepsus, *Reitter*, Ins. 55
Euphiltra, *Meyrick*, Ins. 230
Eupristina, *Saunders*, Ins. 145
Euri[no]myia, *Bigot*, Ins. 245
Eurydice ‖, *Meyrick*, Ins. 215 [*Leach*, Crust. 1818; *Eschscholtz*, Moll. 1826]
Eurymetopus ‖, *Taschenberg*, Ins. 257 [*Schönherr*, Ins. 1840; -pon, *Eschscholtz*, 1831, *Blanchard*, 1844, Ins.]
Euryplaca, *Meyrick*, Ins. 230 [-plax, *Stimpson*, Crust. 1860]
Euryptila, *Sharpe*, Aves 24 [-lium, *Matthews*, Col. 1872]
Eurythecta, *Meyrick*, Ins. 225
Euryurus ‖, *Gervais*, Mamm. 56 [*Von der Marck*, Crust. 1864]
Eustegasta, *Gerstäcker*, Ins. 270
Eusterinx, *Förster* [1871], Ins. 140
Euthynnus, *Lütken*, Pisc. 24
Euvira, *Sharp*, Ins. 46
Exenterella, *Grote*, Ins. 206
Exomias, *Bedel*, Ins. 98

Falagonia, *Sharp*, Ins. 45
Fedora, *Jullien*, Moll. 111
Floridina „ „ 109
Fonscolombia ‖, *Selys*, Ins. 266 [*Lichtenstein*, Ins. 1877]
Fracassa, *Bergh* [1878], Moll. 58

Gamana, *Moore*, Ins. 167
Gamatoba „ „ 168
Ganesa, *Jeffreys*, Moll. 53
Gansia, *Sharp*, Ins. 46
Garnieria, *Gredler*, Moll. 79
Gastroblasta, *Keller*, Cœl. 7
Gastrostomus, *Gill*, Pisc. 31
Gaurocrinus, *Miller*, Ech. 8
Geocharis, *Ehlers*, Ins. 39
Gerontia, *Hutton*, Moll. 68
Gibbulastra, *Monterosato* [1884], Moll. 52
Gigantomilax, *Böttger*, Moll. 62
Glinama, *Moore*, Ins. 168
Globidium, *Flesch*, Prot. 13
Glossobius, *Schiödte*, Crust. 22
Glyphanodus, *Davis*, Pisc. 12
Glyptocephalus ‖, *Edwards*, Ins. 293 [*Gottsche*, 1835, *Agassiz*, 1843, Ins.]
Glyptognathus, *Lydekker*, Rept. 24
Gnathacanthus, *Davis*, Pisc. 12
Gnathochorisis, *Förster* [1871], Ins 140
Gnathorhiza, *Cope*, Pisc. 11
Gœndul, *Koren*, Cœl. 15

Gongyloseps, *Böttger*, Rept. 12
Goniodoma, *Stein*, Prot. 10
Goniognathus ‖, *Heyden*, Ins. 27 [*Agassiz*, Pisc. 1843]
Gonionota ‖, *Meyrick*, Ins. 233 [*Zeller*, Ins. 1879]
Goniopsyllus, *Brady*, Crust. 28
Gonippa, *Möschler*, Ins. 206
Gonorthrus, *Butler*, Ins. 214
Gonothorax, *Milne-Edwards* [1878], Crust. 13
Gregoriella, *Monterosato*, Moll. 89
Gymnatacanthus, *St. John*, Pisc. 10
Gymnobathra, *Meyrick*, Ins. 232
Gymnodinium ‖, *Stein*, Prot. 10 [*Joseph*, Prot. 1879]
Gynaria, *Pascoe*, Ins. 98
Gypsophila, *Oates*, Aves 27
Gyptitia, *Snellen*, Ins. 220

Habroscelimorpha, *Dokhtouroff*, Ins. 23
Hadenella, *Grote*, Ins. 207
Hadrotherium [see Adrotherium]
Hædropleura [? Hadro-], *Bucquoy*, Moll. 44
Hæmatomonas, *Mitrophanoff*, Prot. 9
Halla, *Bergh* [1878], Moll. 57 [Hallia, *M.-Edwards*, Cœl. 1850]
Halyles, *Broun*, Ins. 82
Halobatodes, *F. B. White*, Ins. 288
Halticopsis, *Fairmaire*, Ins. 118
Haplobranchus, *Bourne*, Verm. 13
Haplocladon, *Gorham*, Ins. 82
Haplodyta, *Meyrick*, Ins. 233
Haplolycus, *Bourgeois*, Ins. 79
Harpalidium ‖, *Kolbe*, Ins. 36 [*Westwood*, Ins. 1854]
Harpalyce ‖, *Meyrick*, Ins. 215 *Stephens*, 1829, *Chambers*, 1874, both also in Lepidoptera !]
Helagras, *Cope*, Rept. 17
Heliocausta, *Meyrick*, Ins. 230
Helocera, *Mik*, Ins. 247 [*Duméril*, Ins. 1806, as a group]
Hemianax, *Selys*, Ins. 266
Hemiauchenia, *Gervais*, Mamm. 48
Hemichœrus, *Filhol*, Mamm. 47
Hemidinium, *Stein*, Prot. 10
Hemiopinus, *Fairmaire*, Ins. 77
Hemiphanes, *Förster* [1871], Ins. 140
Heptaphylla, *Freidenreich*, Ins. 85
Hermione ‖, *Meyrick*, Ins. 215 [*Blainville*, Vermes, 1828; *Forbes*, Cœl. 1839]
Herpetochalcis, *Böttger*, Rept. 11
Hesse[e]lla, *Brady*, Crust. 31
Heteranax, *Sharpe*, Aves 21
Heterocapsa, *Stein*, Prot. 10
Heteroplon, *Allman*, Cœl. 6 [-plus, *Mulsant*, Ins. 1871]
Heterotyles, *Broun*, Ins. 102
Heterozyga, *Meyrick*, Ins. 233
Hieropola „ „ 232
Higonius, *Lewis*, Ins. 109
Hinnæya, *Moore*, Ins. 201
Hippolyte ‖, *Meyrick*, Ins. 215 [*Leach*, Crust. 1815]
Hirdapa, *Moore*, Ins. 168
Histiobranchus, *Gill*, Pisc. 40
Histioneis, *Stein*, Prot. 10
Holcocoleus, *Chaudoir*, Ins. 35
Hololampra, *Saussure* [1871], Ins. 271
Hololycus, *Bourgeois*, Ins. 79
Holomeristus, *Förster* [1871], Ins. 140
Holoponerus, *Fairmaire*, Ins. 32
Holopsis, *Broun*, Ins. 123 [-lops, *Philippi*, Ins. 1865]
Homalodus, *Davis*, Pisc. 12 [-des, *Dejean*, Col. 1834]
Hondella, *Moore*, Ins. 200
Hoplitica, *Meyrick*, Ins. 231
Hoplomicra, *Sharp*, Ins. 46
Horanpella, *Moore*, Ins. 200
Hybochinus [Hybech-], *Worthen*, Ech. 5
Hybopterus ‖, *Fairmaire*, Ins. 122 [-ra, *Chaudoir*, Ins. 1872]
Hybosoma, *Gorham*, Ins. 121
Hydatonychus, *Kolbe*, Ins. 40
Hydrocichla, *Hartlaub*, Aves 26
Hyloplesion ‖, *Fritsch*, Rept. 23 [Hylaplesia, *Boie*, Rept. 1827]
Hyperchoristus, *Gill*, Pisc. 37
Hyperskeles [-sce-], *Butler*, Ins. 229
Hyphæria, *Pascoe*, Ins. 99 [-reon, *Macleay*, Ins. 1825]
Hyphalaster, *Sladen*, Ech. 6
Hypocalpe, *Butler*, Ins. 207
Hypocentrinus, *Kolbe*, Ins. 107
Hypocisseis, *J. Thomson* [1879], Ins. 73

Idarnella, *Westwood*, Ins. 146
Idiocheila [-chila], *Frivaldszky*, Ins. 58
Idiosemus, *Berg*, Ins. 291
Idiostolus „ „ 281
Idiosystatus „ „ 291
Idiotropus ‖ „ „ 281 [*Fieber*, Ins. 1861]
Idioxenus, *Förster* [1871], Ins. 140

Idusa, *Schiödte*, Crust. 23
Ilyaster, *Koren*, Ech. 5
Imitator, *Alphéraky*, Ins. 215
Indrodon, *Cope*, Mamm. 28
Insularia, *Tapp.-Canefri*, Moll. 73
Ioptera, *Meyrick*, Ins. 232
Iphim[e]oides, *Jacoby*, Ins. 115
Iphitus ‖, *Jeffreys*, Moll. 47 [*Rafinesque*, Moll. 1815]
Iridessus, *Bates*, Ins. 36
Irona ‖, *Schiödte*, Crust. 23 [-nus, *Bastian*, Verm. 1865]
Isesthes, *Jordan*, Pisc. 26
Isopsetta, *Lockington*, Pisc. 31
Ithutomus[Ithyt-], *Butler*, Ins. 230

Jubella, *Jullien*, Moll. 108
Jujubinus, *Monterosato* [1884], Moll. 52

Kanchia, *Moore*, Ins. 193
Karadira „ „ 168
Kirchenpaueria, *Jickeli*, Cœl. 5
Koninckioceras, *Hyatt*, Moll. 39
Kossmechthrus [? Cosmechthrus], *Della Valle*, Crust. 29
Kradibia[Cra-], *Saunders*, Ins. 145
Kuldscha, *Alphéraky*, Ins. 215

Labichthys, *Gill*, Pisc. 39
Labomimus, *Sharp*, Ins. 54
Lælioides, *Moore*, Ins. 193
Lagynopteryx, *Berg*, Ins. 215
Lamesis, *Westwood*, Ins. 76
Lataxiena, *Jousseaume*, Moll. 40
Latelmis, *Reitter*, Ins. 64
Lathicrossa, *Meyrick*, Ins. 233
Lehera, *Moore*, Ins. 179
Leiochbrota, *Westwood*, Ins. 90
Leiochrinus[Lio-] „ „ 89
Leiochrodes[Lio-] „ „ 89
Leiochrotina[Lio-] „ „ 90
Leistarcha, *Meyrick*, Ins. 231
Leistomorpha „ „ 233
Lekuthopora and Lekythopora [Lecy-], *McGillivray*, Moll. 111
Leme, *De Vis*, Pisc. 26
Lenodora, *Moore*, Ins. 200
Lepidisis ‖, *Verrill*, Cœl. 15 [-sia, *White*, Ins. 1855]
Lepidophorus ‖, *Taschenberg*, Ins. 257 [*Kirby*, Ins. 1837; -ra, *Westwood*, Ins. 1835]
Lepidotarsa, *Meyrick*, Ins. 230
Lepimacrus [? Macrolepis ‖], *Hesse*, Crust. 30
Leptocala, *Gerstæcker*, Ins. 272
Leptocroca, *Meyrick*, Ins. 233
Leptodus, *Kayser*, Pisc. 11 [-des, *Swainson*, Pisc. 1839; *Dejean*, Col. 1838]
Leptonia, *Sharp*, Ins. 45
Leucophlœus, *Carter*, Spong. 8
Linodesmus, *Bedel*, Ins. 121
Linosticha, *Meyrick*, Ins. 231
Lintorata, *Moore*, Ins. 167
Lioolius, *Gorham*, Ins. 85
Lispacanthus, *Davis*, Pisc. 12
Locheutis, *Meyrick*, Ins. 232
Lochmæa ‖, *Weise*, Ins. 119 [-mæus, *Doubleday*, Ins. 18—; -mia, *Swainson*, Aves, 1827]
Longicilium, *Milne*, Prot. 9
Lontara, *Moore*, Ins. 168
Lopanella, *Pocta*, Spong. 11
Lophiomus, *Gill*, Pisc. 25
Lophocateres, *Olliff*, Ins. 61
Lopholycus, *Bourgeois*, Ins. 79
Lophorhombus, *Macleay*, Pisc. 31
Lophotriccus, *Berlepsch*, Aves 34
Loripinus, *Monterosato*, Moll. 94
Lucidina, *Gorham*, Ins. 81
Lucinella, *Monterosato*, Moll. 94
Lu[e]tkesaurus, *Kiprijanoff*, Rept. 8
Luidiaster, *Studer*, Ech. 5
Lussa, *Grote*, Ins. 207
Lychnosca, *Grote*, Ins. 215
Lygdus, *Distant*, Ins. 284
Lysaua, *Möschler*, Ins. 195

Machæritis ‖, *Meyrick*, Ins. 233 [-tes, *Miller*, Ins. 1855]
Machairopus[-chæro-], *Brady*, *Crust.* 28
Machetis ‖, *Meyrick*, Ins. 231 [-tes, *Cuvier*, Aves, 1817]
Macrobathra, *Meyrick*, Ins. 233
Macronemata, *Meyrick*, Ins. 232 [-nema, *Pictet*, Ins. 1836]
Mahintha, *Moore*, Ins. 168
Malakichthys[Malac-], *Steindachner*, Pisc. 19
Mangalisa, *Moore*, Ins. 168
Mangiliella, *Bucquoy*, Moll. 44
Mantipus, *Peters*, Rept. 20
Maseochara, *Sharp*, Ins. 44
Mastodictyum, *Sollas*, Spong. 11
Medea ‖, *Böttger*, Moll. 74 [*Eschscholtz*, Cœl. 1829]
Megalagrion, *McLachlan*, Ins. 267
Megalasma, *Hoek*, Crust. 31
Megalocolus, *Kirby*, Ins. 145
Melaneulia, *Butler*, Ins. 224
Melanocichla, *Sharpe*, Aves, 26
Melanomœcyna, *Butler*, Ins. 220

Melanostoma ‖, *Steindachner*, Pisc. 19 [*Schiner*, 1860, *Stal*, 1872, Ins.]
Melectoides, *Taschenberg*, Ins. 129
Melinda ‖, *Moore*, Ins. 167 [*Desvoidy*, Ins. 1830]
Melophorus, *Lubbock*, Ins. 135
Menama, *Moore*, Ins. 168
Mentraphus, *Sharp*, Ins. 54
Meristodon ‖, *Sauvage*, Pisc. 11 [*Agassiz*, Pisc. 1843]
Merolycus, *Bourgeois*, Ins. 79
Merona ‖, *Sharp*, Ins. 45 [*Norman*, Cœl. 1865]
Merope ‖, *Thomson*, Crust. 28 [*Newman*, Ins. 1838; *Adams*, 1858, *Albers*, 1860, Moll.]
Mesitotherium, *Trouessart*, Mamm. 40
Mesolecta, *Meyrick*, Ins. 232
Mesolycus, *Gorham*, Ins. 80
Mesomorpha ‖, *Pratz*, Cœl. 14 [*Hodgson*, Aves, 1841]
Messalia, *Pascoe*, Ins. 92 [-la, *Curtis*, Ins. 1836; Mesalia, *Gray*, Moll. 1840]
Mestapra, *Moore*, Ins. 168
Metriotherium, *Filhol*, Mamm. 47
Micranobium, *Gorham*, Ins. 84
Microbela, *Meyrick*, Ins. 233
Microcavia, *Gervais*, Mamm. 39
Microcichla, *Hartlaub*, Aves 26
Microdontia ‖, *Tapp.-Canefri*, Moll. 92 [-ta, *Hope*, 1807, *Chevrolat*, 1834, Ins.; -odon, *Meigen*, Ins. 1803, *Agassiz*, Pisc. 1833, *Conrad*, Moll. 1842]
Microscalabotes, *Boulenger*, Rept. 10
Microsemyra, *Butler*, Ins. 206
Microtechnites, *Berg*, Ins. 285
Microvalgus, *Kraatz*, Ins. 71
Minia, *Pascoe*, Ins. 100
Minytus, *Distant*, Ins. 284
Miocalles, *Pascoe*, Ins. 105
Miomeris, *Förster* [1871], Ins. 140
Mitothemma, *Butler*, Ins. 222
Mitrolumma, *Bucquoy*, Moll. 42
Mixodectes, *Cope*, Mamm. 28
Monanchora, *Carter*, Spong. 8
Monomita, *Grassi*, Prot. 2
Montaguana, *Chilton*, Crust. 19
Moranila, *Cameron*, Ins. 146
Motrita, *Westwood*, Ins. 121
Myarda, *Pascoe*, Ins. 101
Mycophagus ‖, *Friedenreich*, Ins. 59 [-ga, *Rondani*, Dipt. 1856]
Myotyphlus, *Fauvel*, Ins. 50
Myriarthrus, *Förster* [1871], Ins. 140
Myrmecalydus, *Berg*, Ins. 280
Myrmecopeplus „ „ 285
Myrmecophana, *Brunner*, Ins. 274
Myrmecozelotes, *Berg*, Ins. 285
Mytilaster, *Monterosato*, Moll. 89

Nacamsa, *Moore*, Ins. 168
Narcissastræa, *Pratz*, Cœl. 14
Narichona, *Kirsch*, Ins. 119
Nasuma, *Moore*, Ins. 167
Neastus, *Holmgren*, Ins. 139
Nebroda, *Moore*, Ins. 167
Neoblytus, *Bedel*, Ins. 121
Neocazira, *Distant*, Ins. 278
Neochalcis, *Kirby*, Ins. 145
Neoditrema, *Steindachner*, Pisc. 29
Neolara, *Sharp*, Ins. 45
Neolycus, *Bourgeois*, Ins. 79
Nematoscelis ‖, *Sars*, Crust. 18 [*Wollaston*, Ins. 1867]
Nepheloleuca, *Butler*, Ins. 214
Nephogenes, *Meyrick*, Ins. 232
Neralsia, *Cameron*, Ins. 148
Nesitis, *Bedel*, Ins. 121
Neuraphanax, *Reitter*, Ins. 57
Nipara, *Moore*, Ins. 168
Niphetophora, *Kraatz*, Ins. 71
Notioscythis, *Fairmaire*, Ins. 87
Notographus, *J. Thomson* [1879] Ins. 73
Notolampra, *Saussure* [1864], Ins. 271
Nyctiphanes ‖, *Sars*, Crust. 18 [Nycto-, *Dejean*, Ins. 1833]
Nymphostola, *Meyrick*, Ins. 231

Oceanopsis, *Fewkes*, Cœl. 5
Ochlogenes, *Meyrick*, Ins. 233
Ochropisus, *Bates*, Ins. 30
Ocyota, *Sharp*, Ins. 44
Odostomella [Odontostomiella], *Bucquoy*, Moll. 50
Œnochroa, *Meyrick*, Ins. 231 [-chrus, *Bonaparte*, Aves, 1854; -chroma, *Guénée*, 1857, *Pascoe*, 1872, Ins.]
Œnomia, *Pascoe*, Ins. 92
Ofellus, *Distant*, Ins. 285
Ogiva, *Jullien*, Moll. 109
Ogivalia „ „ 109
Olygodon [Olig-] ‖, *Ameghino*, Mamm. 55 [*Boie*, Rept. 1827]
Omoptycha, *Quedenfeldt*, Ins. 112
Omotrachelus, *Kolbe*, Ins. 97
Onychocella, *Jullien*, Moll. 109
Oocorys, *Fischer*, Moll. 41
Ophiobrachion, *Lyman*, Ech. 6
Ophiocopa „ „ 6
Ophiotoma „ „ 6

Ophryocystis, *Schneider*, Prot. 13
Ophthalmomiris, *Reuter*, Ins. 285
Opisthochasis, *Berg*, Ins. 283
Opocrates, *Horváth*, Ins. 278
Oranasma, *Moore*, Ins. 168
Orasus, *Distant*, Ins. 284 [-sius, *Oken*, Mamm. 1816]
Orimargula, *Mik*, Ins. 240
Ornithocercus, *Stein*, Prot. 10
Orophia ‖, *Meyrick*, Ins. 233 [-ius, *Redtenbacher*, Ins. 1849]
Orospina ‖, *Cabanis*, Aves 32 [*Kaup*, Aves, 1829]
Orthomecyna, *Butler*, Ins. 220
Orthomerus, *Seeley*, Rept. 5
Orthopleurodus, *St. John*, Pisc. 9
Osaces, *Pascoe*, Ins. 106
Otitesella, *Westwood*, Ins. 146
Oxythecta, *Meyrick*, Ins. 233
Oxyclænus, *Cope*, Mamm. 33
Oxyodontotherium, *Ameghino*, Mamm. 43
Oxyopomyrmex, *André*, Ins. 135
Oxystethus, *Fairmaire*, Ins. 77
Oxytoxum, *Stein*, Prot. 10

Pachycephala ‖, *Fairmaire*, Ins. 60 [*Swainson*, Aves, 1827; *Doleschall*, 1858, *Lioy*, 1863, Dipt.; *Brown*, Col. 1881; -lus, *Wiedemann*, Dipt. 1830; *Agassiz*, Pisc. 1843; *Uhler*, Rhynch. 1860]
Pachycetus, *Van Beneden*, Mamm. 53
Pachymyxa, *Gruber*, Prot. 2
Pachyphœnix, *Butler*, Ins. 230
Pachyprypnus, *Brown*, Ins. 100
Pachystylus ‖, *Rey*, Ins. 115 [*Wollaston*, Ins. 1873, *Gemmellaro*, Moll. 1878; -lum, *Macquart*, Ins. 1848; -la, *Lioy*, Ins. 1864, *Mörch*, Moll. 1852]
Pademma, *Moore*, Ins. 168
Palæhoplophorus, *Ameghino*, Mamm. 56
Palæochrysa, *Scudder*, Ins. 254
Palæognathus, *Wagn*, Ins. 65
Palæphatus, *Butler*, Ins. 230
Panacea, *Godman*, Ins. 174
Panopæa ‖, *Meyrick*, Ins. 215 [*Ménard*, Moll. 1807; *Hübner*, Ins. 1816]
Pantisarthrus, *Förster* [1871], Ins. 140
Paracalocoris, *Distant*, Ins. 285
Paracirrhites, *Steindachner*, Pisc. 21
Paradieuches, *Distant*, Ins. 281
Parahypsylla, *Riley*, Ins. 293
Paralates, *Sauvage*, Pisc. 17
Paralimax, *Böttger*, Moll. 62
Paralindria, *Olliff*, Ins. 60
Paranerius, *Bigot*, Ins. 250
Parasierola, Cameron, Ins. 147
Parastrachia, *Distant*, Ins. 279
Parhaplodactylus, *Thominot*, Pisc. 21
Parotermes, *Scudder*, Ins. 258
Parthenina, *Bucquoy*, Moll. 50
Parysatis ‖, *Meyrick*, Ins. 215 [*Thomson*, 1868, *Stal*, 1874, Ins.]
Pasiphila ‖, *Meyrick*, Ins. 216 [-le, *Thomson*, Ins. 1864]
Pasithea ‖, *Meyrick*, Ins. 216 [*Lamouroux*, Cœl. 1812; *Lea*, Moll. 1833; *Blackwall*, Arachn. 1858]
Patellastra, *Monterosato* [1884], Moll. 54
Patosa, *Moore*, Ins. 168
Payraudeautia, *Bucquoy*, Moll. 45
Pediophoneus, *Arribálzaga*, Ins. 242
Pelopsia, *Facciolà*, Pisc. 33
Peltophora ‖, *Meyrick*, Ins. 233 [*Burmeister*, Ins. 1835]
Penoa, *Moore*, Ins. 168
Pentameria ‖, *Friedenreich*, Ins. 118 [-rus, *Sowerby*, Moll. 1813; -ra, *Stimpson*, Ech. 1848]
Pericordus, *Kolbe*, Ins. 110
Perissoneura ‖, *Distant*, Ins. 290 [*McLachlan*, Ins. 1871]
Perithrix, *Fairmaire*, Ins. 89
Petalanthes, *Meyrick*, Ins. 231
Petalodera, *Horváth*, Ins. 278
Petalodopsis, *Davis*, Pisc. 13
Petalope, *Pocta*, Spong. 11 [-lops, *Serville*, Ins. 1843; -pus, *Motschulsky*, Ins. 1845, *Clapurède*, Prot. 1859, *Sars*, Crust. 1864]
Phalacroma ‖, *Stein*, Prot. 10 [*Hawle*, Crust. 1847]
Phiditia, *Möschler*, Ins. 193
Philicus, *Pascoe*, Ins. 113
Philobata, *Meyrick*, Ins. 232
Philonympha „ „ 233
Phirdana, *Moore*, Ins. 168
Phlegmodoris, *Bergh* [1878], Moll. 58
Phlœodictyon, *Carter*, Spong. 8
Phlœopola, *Meyrick*, Ins. 232
Phoderacanthus, *Davis*, Pisc. 15
Phœophanus, *Brown*, Ins. 100
Phortiœca, *Saussure* [1864], Ins. 272
Phreatoicus [-œcus], *Chilton*, Crust. 20
Phriconyma, *Meyrick*, Ins. 232
Phrixgnathus [Phricog-] *Hutton*, Moll. 80

Phrygena, *Pascoe*, Ins. 105
Phrynocara, *Peters*, Rept. 20
Phthanocoris, *Scudder*, Ins. 288
Phycocus, *Broun*, Ins. 69
Phycopsis, *Carter*, Spong. 8
Phyllergates, *Sharpe*, Aves 25
Phyllobates ‖ „ „ 25 [*Dumeril*, Rept. 1840]
Phyllodoce ‖, *Meyrick*, Ins. 216 [*Brown*, Cœl. 1756; *Savigny*, Verm. 1817]
Phyllogyra, *Tomes*, Cœl. 14
Phyllopus, *Brady*, Crust. 26
Phylloseris, *Tomes*, Cœl. 13
Phymæus, *Pascoe*, Ins. 91
Physastra, *Tapp.-Canefri*, Moll. 82
Piasus, *Distant*, Ins. 284
Piloprepes, *Meyrick*, Ins. 232
Pinconia, *Moore*, Ins. 196
Pisinidea, *Butler*, Ins. 230
Pitnus [!], *Gorham*, Ins. 84
Placocosma, *Meyrick*, Ins. 231
Plagiomonas, *Grassi*, Prot. 2
Plagiopsis, *Berg*, Ins 291
Plakarthrium [Plac-], *Chilton*, Crust. 21
Planes ‖, *Saussure* [1864], Ins. 271 [*Rondani*, Ins. 1864]
Planeteros, *Gorham*, Ins. 79
Platatherium [vox hybr.], *Gervais*, Mamm. 49
Platonica, *Sharp*, Ins. 45
Platycotylus ‖, *Olliff*, Ins. 61 [-le, *Beneden*, Verm. 1863]
Platygerris, *F. B. White*, Ins. 288
Platylæmus, *Weise*, Ins. 104
Plectoptera, *Saussure* [1864], Ins. 271
Plectospyris, *Sollas*, Spong. 11
Plectromus, *Gill*, Pisc. 22
Pleistodontes [Plist-], *Saunders*, Ins. 145 [-odon, *Dumeril*, Rept. 1839]
Plesioseris, *Duncan*, Cœl. 14
Plesi[o]spermophilus, *Filhol*, Mamm. 36
Plethælurus, *Cope*, Mamm. 29
Pleurhomus, *Sharp*, Ins. 43
Plioplarchus, *Cope*, Pisc. 20
Pnigeacanthus, *St. John* [1875; see Errata], Pisc. 10
Podalia, *Pascoe*, Ins. 106
Podapion, *Riley*, Ins. 103
Podolampas, *Stein*, Prot. 10
Pœcilogale, *Thomas*, Mamm. 30
Polyaulon, *Förster* [1871], Ins. 140
Polysternon [-num], *Portis*, Rept. 7
Pontellopsis, *Brady*, Crust. 27
Pontostratiotes „ „ 28
Porolerus, *Sharp*, Ins. 53
Porpomiris, *Berg*, Ins. 285
Porrolagria, *Kolbe*, Ins. 92
Potamolepis, *Marshall*, Spong. 8
Pramasa, *Moore*, Ins. 168
Pramesta „ „ 168
Prionodura, *De Vis*, Aves 24
Pristolycus, *Gorham*, Ins. 80
Proagoderus, *Lansberge*, Ins. 66
Proboscidimyia, *Bigot*, Ins. 249
Prochœrodes, *Grote*, Ins. 215
Proclitus, *Förster* [1871], Ins. 140
Proconus, *Broun*, Ins. 108 [-nia, *Lepelletier*, Ins. 1832]
Proctoceras, *Kirby*, Ins. 145
Progymnodon, *Dames*, Pisc. 40
Promegatherium, *Ameghino*, Mamm. 55
Promylodon, *Ameghino*, Mamm. 55
Propalæomeryx, *Lydekker*, Mamm. 48
Propristis, *Dames*, Pisc. 13
Propseudopus, *Hilgendorf*, Rept. 11
Prosoparia, *Grote*, Ins. 215
Protaucheuia, *Branco*, Mamm. 48
Proteodes, *Meyrick*, Ins. 231
Proterotherium, *Ameghino*, Mamm. 47
Protomacha ‖, *Meyrick*, Ins. 233 [-chus, *Stal*, Ins. 1876]
Protoparnus, *Sharp*, Ins. 64
Protragelephus, *Dames*, Mamm. 49
Pryteria, *Möschler*, Ins. 190
Pseudacalles, *Fairmaire*, Ins. 105
Pseudacontia, *J. B. Smith*, Ins. 207
Pseudæga, *Thomson*, Crust. 21
Pseudanthœcia, *J. B. Smith*, Ins. 207
Pseudocephennium, *Reitter*, Ins. 57
Pseudochalcis, *Kirby*, Ins. 145
Pseudoficimia, *Bocourt*, Rept. 15
Pseudohelotes, *Guimarães*, Pisc. 18
Pseudolestodon, *Gervais*, Mamm. 55
Pseudomeira [-mira], *Stierlin*, Ins. 98
Pseudonematon, *Hubrecht*, Verm. 1 [-ma, *McLachlan*, Ins. 1862]
Pseudotamila, *J. B. Smith*, Ins. 207
Pseudotantalus, *Ridgway*, Aves 42
Pseudothalestris, *Brady*, Crust. 28
Psorochroa, *Broun*, Ins. 77
Pterostigma, *Buckton*, Ins. 295
Ptilocaulis, *Carter*, Spong. 8
Ptilopyga, *Sharpe*, Aves 27
Ptychodesthes, *Kraatz*, Ins. 71
Ptychodiscus, *Stein*, Prot. 10
Ptychopterus ‖, *Broun*, Ins. 112 [*Klug*, Ins. 1842; -ra, *Meigen*, Ins. 1803]

Ptyrticus, *Hartlaub*, Aves 27
Pycnocrinus, *Miller*, Ech. 8
Pygotenucha, *Grote*, Ins. 190
Pyrgidium ‖, *Stein*, Prot. 10 [*Turner*, Moll. 1869]
Pyrophacus, *Stein*, Prot. 10
Pyxidognathus, *Milne-Edwards* [1878], Crust. 15

Quedenfeldtia, *Böttger*, Rept. 10
Querimana, *Jordan*, Pisc. 27

Rachitrema [Rhacheot-], *Sauvage*, Rept. 6
Radama, *Raffray*, Ins. 55 [-mas, *Münster*, Pisc. 1843; -mus, *Kirsch*, Ins. 1875]
Radicipes, *Stearns*, Cœl. 15
Raffraya, *Bourguignat*, Moll. 61
Ramphodus [Rhamph-], *Davis*, Pisc. 12 [-des, *Guénée*, Lep. 1845]
Raphitreus, *Sharp*, Ins. 54
Rasuma, *Moore*, Ins. 168
Rathouisia, *Heude*, Moll. 81
Ravadeba, *Moore*, Ins. 168
Rechota, *Sharp*, Ins. 45
Rhabdonotus, *Milne Edwards* [1878], Crust. 14
Rhaphidura, *Oates*, Aves 36
Rhexana, *Schiödte*, Crust. 22
Rhinanisus, *Broun*, Ins. 108
Rhinocichla, *Sharpe*, Aves 26
Rhinorthra, *Schiödte*, Crust. 23
Rhizohydra, *Cope*, Cœl. 4
Rhodosea, *Grote*, Ins. 207
Rhopaloceras ‖, *Taschenberg*, Ins. 257 [*Redtenbacher*, Ins. 1842]
Rhynchocephala ‖, *Fairmaire*, Ins. 71 [-lus, *Fischer*, Ins. 1806]
Rhytidophyllum, *Lindstrom*, Cœl. 16
Ribodon, *Ameghino*, Mamm. 43
Ricnodon [Rhicno-], *Fritsch*, Rept. 23
Ridgwayia, *Stejneger*, Aves 21
Riebeckia, *Martens*, Moll. 76
Rufospira, *Möllendorf*, Moll. 78
Rybaxis, *Saulcy* [1876], Ins. 54

Sabalassa, *Moore*, Ins. 167
Sabanosa „ „ 168
Sandbergeroceras, *Hyatt*, Moll. 39
Sangatissa, *Moore*, Ins. 200
Saophris, *Schiödte*, Crust. 22
Saphara, *Moore*, Ins. 168
Saphoglossa, *Sharp*, Ins. 46
Sapho [r]rhynchus, *Sharp*, Ins. 161
Sarcobotrylloides, *Drasche*, Moll. 102
Sarobia, *Moore*, Ins. 168 [Saribia, *Butler*, Ins. 1878; -roba, *Walker*, Ins. 1865]
Saropla, *Meyrick*, Ins. 233
Satanga, *Moore*, Ins. 168
Satrapia, *Meyrick*, Ins. 233
Scalabrinitherium, *Ameghino*, Mamm. 43
Scaritoderus, *Fairmaire*, Ins. 33
Sceparnodon, *Owen*, Mamm. 58
Sceptobius, *Sharp*, Ins. 45
Schaufussia, *Raffray*, Ins. 53
Schistodactylus „ „ 55
Schizoneuroides, *Buckton*, Ins. 296
Schizopila, *Saussure* [1864], Ins. 272
Schizotricha, *Allman*, Cœl. 5
Schlechtendalia, *Lichtenstein*, Ins. 296
Schœyenia, *Aurivillius*, Ins. 206
Sciurella, *Allman*, Cœl. 5
Scleroides, *Fairmaire*, Ins. 89
Scolecithrix [Scoleco-, *vel* Tricho-scolex], *Brady*, Crust. 26
Scolecomorphus, *Boulenger*, Rept. 23
Scotocichla, *Sharpe*, Aves 27
Scotorythra, *Butler*, Ins. 215
Scutuloidea, *Chilton*, Crust. 21
Scytaliscus, *Jordan*, Pisc. 30
Seeleya, *Fritsch*, Rept. 23
Selenochlamys, *Böttger*, Moll. 60
Selinda, *Moore*, Ins. 168
Semiocosma, *Meyrick*, Ins. 232
Serrivomer, *Gill*, Pisc. 39
Sigm[at]ops „ „ 37
Signoretiella, *Berg*, Ins. 289
Silidius, *Gorham*, Ins. 81
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