

THE
ZOOLOGICAL RECORD

IN C FOR 1884;

BEING

VOLUME THE TWENTY-FIRST

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OF THE

CORD OF ZOOLOGICAL LITERATURE.

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EDITED BY

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LONDON :

JOHN VAN VOORST, PATERNOSTER ROW.

M.DCCC.LXXXV.

1885



Acc. no. - 457
date - 12/12/06

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

591-05
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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.

IT is in no spirit of formality that public expression is given to the sense of great loss which those who make and those who use the ZOOLOGICAL RECORD feel at the death of Mr. E. C. Rye, who for ten years fulfilled the duties of Editor. The experience already gained by me in a work which I undertook with no light heart enables me to assure zoologists that they owed Mr. Rye many thanks; it is to be hoped that future volumes may be kept up to the high standard to which he brought the last ten.

Two of the Recorders who have longest and most laboriously worked on the RECORD find themselves compelled—the one by his duties at the Berlin Museum, the other by a desire to complete the Catalogue of Moths, on which he has been long engaged—to sever, after this year, their active duties in connection with it; the thanks of zoologists are due to Prof. E. von Martens and Mr. W. F. Kirby for all they have done in the past.

Dr. Murie, who had promised Mr. Rye to report on the Mammalia, failed to send in his Record by as late a date as October the 15th; Mr. W. L. Sclater has supplied one at very short notice. Mr. R. Bowdler Sharpe was compelled to resign his office on being sent to India to receive the Hume Collection of Birds; Mr. A. H. Evans has undertaken his duties. The post of Recorder of Coelenterates, which was vacant, has been accepted by Prof. Haddon.

In future volumes, Dr. Sharp will replace Mr. Kirby; Prof. Herdmann, Messrs. W. E. Hoyle, G. R. Vines, and G. H. Fowler will take the place of Prof. E. von Martens.

The fact that the RECORD has now reached its twenty-first volume, coupled with the change in editorship, appeared to justify some alteration in the arrangement of the parts which should

bring it more into accord with the advance of our science ; I have, therefore, rearranged the Molluscoidea, placing the Tunicata next to the Fishes, and distinguishing the Brachiopoda from the Polyzoa, while the Echinodermata now precede the Vermes. On the other hand, I have retained old arrangements where a change might cause inconvenience ; thus, after taking the advice of Mr. McLachlan, the groups of Insects have been left unaltered ; Reptiles and Batrachians are in the same section, and *Balanoglossus* remains with the Vermes.

It is my pleasant duty to acknowledge grants of £150 from the Government Grant Committee of the Royal Society, and of £100 from the British Association ; and to thank the institutions and individuals who have supplied the Recorders with copies of their publications.

F. JEFFREY BELL.

LONDON,

17th December, 1885.

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- Bull. U. S. Nat. Mus.*—Bulletin of the United States National Museum (Washington).
- Canad. Ent.*—Canadian Entomologist (Saunders : Montreal).
- Canad. Nat. (n.s.)*—The Canadian Naturalist and Quarterly Journal of Science. New series (Montreal).
- CB. Ges. Anthropol.*—Correspondenzblatt der Deutschen Gesellschaft für Anthropologie, &c. (Brunswick).
- CB. [or Centralbl.] med. Wiss.*—Centralblatt für die medicinischen Wissenschaften (Berlin).
- 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.*—Circulars 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).
- Encycl. Brit.*—Encyclopædia Britannica. 9th ed. (Edinburgh).
- 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 (Spångberg : 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 gefiedrte Welt : Zeitschrift für Vogelliebhaber, -zuechter 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 (Sclater & Saunders : London).
- Intern. J. Anat. Hist.*.—The Monthly International Journal of Anatomy and Histology (Berlin, London, & Paris).
- J. Anat. Phys.*—Journal of Anatomy and Physiology (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. Hamb.*—Jahrbuch der Hamburgischen wissenschaftlichen Anstalten.
- 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 : Frankfurt).
- 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 Tharanden 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 (Pelletan : Paris).
- J. Micr. & Nat. Sci.*—Journal of Microscopy and Natural Science. (The Journal of the Postal Microscopical Society. A. Allen : London & Bath.)
- 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 Ciencias da Academia de Lisboa (Lisbon).
- J. Soc. Arts*—Journal of the Society of Arts (London).
- Kolozsvári Orvos-term. társ. Értes.*—Kolozsvári Orvos-természettudományi társulat Értesítő [Intelligencer of the Society of Medical and Natural Science, Kolozsvár].
- Kosmos*—Kosmos : Zeitschrift für einheitliche Weltauschauung auf Grund der Entwicklungslehre.

- 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. Ac. Barcel.—Memorias de la real Academia de Ciencias naturales y Artes de Barcelona.
Mém. Ac. Belg.—Mémoires de l'Académie royale des Sciences, des lettres et des beaux-arts de Belge (Brussels).
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. Vaocluse—Mémoires de l'Académie de Vaocluse.
Mem. Bost. Soc.—Memoirs of the Boston Society of Natural History.
Mém. Inst. Génév.—Mémoires de l'Institut national Genévois (Geneva).
Mem. Ist. Venet.—Memorie del R. Istituto Veneto di Scienze, &c. (Venice).
Mém. Liège—Mémoires de la Société Royale des Sciences de Liège.
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).
Mém. 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. Genève.*—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 Archaeological Societies and Field Clubs of the Midland Counties (Badger & Harrison: Birmingham).
- Morph. JB.*—Morphologisches Jahrbuch: eine Zeitschrift für Anatomie und Entwicklungsgeschichte (Gegenbaur: Leipzig).
- MT. anthrop. Ges. Wien*—Mittheilungen der anthropologischen Gesellschaft in Wien (Vienna).
- MT. Embr. Inst. Wien*—Mittheilungen aus dem Embryologischen Institute der k. k. Universität in Wien (Schenck: 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-Bezirktes, 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 (Frankfurt).
- 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 (Schjødte: Copenhagen).
Nat. Tijdschr. Nederl. Ind.—Natuurkundig Tijdschrift voor Nederlandsche Indie (Batavia).
Natur—Die Natur: Zeitung zur Verbreitung naturwissenschaftlichen Kenntniss und Naturanschauung für Leser alle Stände. Organ des deutschen Humboldt-Verein (Müller: Halle).
Naturalist—The Naturalist: Journal of the Yorkshire Naturalists' Union, &c. (Hobkirk & Porritt: Huddersfield).
Nature—Nature (London).
Naturforscher—Naturforscher; Wochenblatt zur Verbreitung der Fortschritte in den Naturwissenschaften (Sklarek: Berlin).
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).
Öf. Ak. Förh.—Öfversigt af k. Vetenskaps Akademiens Förhandlingar (Stockholm).
Onderz. Phys. Lab. Utrecht.—Onderzoekingen gedaan en het physiologisch Laboratorium der Utrechtsche Hoogeschool.
Overs. Dan. Selsk.—Oversigt over det k. Danske Videnskabernes Selskabs Forhandling (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 (Sydney).
- 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. Dubl. Soc.*—Proceedings of the Royal Dublin Society.
- 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. Queensl.*—Proceedings of the Royal Society of Queensland (Brisbane).
- P. R. Soc. Tasm.*—Papers and Proceedings and Reports of the Royal Society of Tasmania (Hobarton).

- P. R. Soc. Vict.*—Proceedings of the Royal Society of Victoria (Melbourne).
- 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.).
- 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 Belgique (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. Bost. Z. Soc.*—Quarterly Journal of the Boston Zoological Society (Boston, Mass.).
- Q. J. Geol. Soc.*—Quarterly Journal of the Geological Society (London).
- Q. J. Micr. Sci.*—Quarterly Journal of Microscopical Science (London).
- Rad jugoslav. akad.*—Rad jugoslavenske akademije znanosti i umjetnosti (Zagreb). [Transactions of the South Slav Academy of Science and Art.]
- 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 of 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. Marl. 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 Commissioner, 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 (Doukhtoureff : St. Petersburg).
- Rev. Montp.*—Revue des Sciences naturelles (Montpellier).
- Rev. Sci.*—Revue Scientifique de la France et de l'Etranger (Paris).
- Rev. Sci. Nat.*—Revue des Sciences Naturelles (Dubreuil : Paris).
- Rev. Soc. Porto*—Revista da Societa de Instrucção de Porto.
- Rev. Tierheilkunde*—Revue für Tierheilkunde und Tierzucht (Vienna).
- Rov. Lapok*—Rovartani Lapok [Entomological Leaves] (G. Horváth : Budapest).
- 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 mathematische-naturwissenschaftlichen Classe der k. Akademie der Wissenschaften (Vienna).
- SB. bayer. Ak.*—Sitzungsberichte der mathematisch-physikalischen Classe der k. bayerischen Akademie der Wissenschaften (Munich).
- SB. böhm. Ges.*—Sitzungsberichte der k. böhmischen Gesellschaft der Wissenschaften (Prague).
- SB. 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 gesamten 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. physikalisch-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. fizyjoigr.*—Sprawozdanie Komisji fizyjoigrafiicznej, &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-Akademiens Handlingar (Stockholm).
- Tag. Deut. Nat. Vers.*—Tageblatt der Versammlung deutscher Naturforscher und Aertzte.
- Term. füzetek*—Természetrájszi füzetek : az 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 Thurm : 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. Conn. Ac.*—Transactions of the Connecticut Academy of Sciences (New Haven).
- Tr. Devon. Ass.*—Report and Transactions of the Devonshire Association for the Advancement of Science, &c. (Plymouth).
- Tr. 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. L. S. New York*—Transactions of the Linnean Society of New York.
- 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).
- Tromsø Mus. Aarsh.*—Tromsø 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 (Bäle).
- Verh. siebenb. Ver.*—Verhandlungen und Mittheilungen des siebenbürgischen Vereins für Naturwissenschaften (Hermannstadt).
- Verh. Ver. Brünn*—Verhandlungen des naturforschenden Vereins in Brünn.

- Verh. Ver. Hamb.*—Verhandlungen des Vereins für naturwissenschaftliche Unterhaltung zu Hamburg.
- Verh. Ver. Rheinl.*—Verhandlungen des naturhistorischen Vereins der 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).
- Wiedomosci z nauki przyrod.* = Materialien 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. f. Thiermed.*—Zeitschrift für Thiermedizin und vergleichende Pathologie.
- 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. ges. Orn.*—Zeitschrift für die gesammte Ornithologie (Von Madarász : Budapest).
- Z. Naturw.*—Zeitschrift für Naturwissenschaften. Original Abhandlungen und Berichte herausgegeben im Auftrage der naturwissenschaftlichen Vereins für Sachsen und Thüringen (Brass : Halle-a.-S.).
- 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 : Frankfurt).
- Zool. Rec.*—The Zoological Record (Rye : London).
- Z. wiss. Geogr.*—Zeitschrift für wissenschaftliche Geographie (Kettler : Lahr, in Baden).
- Z. wiss. Mikr.*—Zeitschrift für wissenschaftliche Mikroskopie und für mikroskopische Technik (Behrens : Braunschweig).
- Z. wiss. Zool.*—Zeitschrift für wissenschaftliche Zoologie (Siebold, Kölliker, & Ehlers : Leipzig).

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ZOOLOGICAL RECORD



Aceno. 454
 at 12/12/06

W. L. SCLATER, B.A., F.Z.S.

I.—INTRODUCTION.

THE discovery of the mode of reproduction in the Monotremes is the great event in the history of Mammals in 1884; and is, indeed, the most important fact in relation to this Class that has been ascertained for many years. Although it has been suspected, and even asserted, by many authors that the *Ornithorhynchus* lays eggs, absolute certainty upon this point was only attained in the summer of 1884, when Mr. W. H. Caldwell announced that Monotremes are oviparous, and that the segmentation of their ova is meroblastic (53). [See also Spencer (320), Haacke (135), and Owen (262).]

The most important anatomical works relating to Mammals published in 1884 are Retzius' volume on the Vertebrate auditory organ (287), and Ludwig Prince of Bavaria's monograph on the comparative anatomy of the tongue (21).

In Palæontology, Marsh has published his second great volume on the *Dinocerata* (214); and valuable work has been done by Cope (72), Lydekker (207), and Schlosser (300).

Of faunistic works, may be specially mentioned Tristram's Fauna of Palestine (342), and Merriam's essay on the Vertebrates of the Adirondack Mountains (221).

The new genera of Mammals characterized in 1884 were 15 in number, of which 5 are recent and 10 fossil; the new species described were 103, of which 30 are recent and 83 fossil; besides which, 7 recent forms and 3 extinct have been designated as subspecies.

II.—LIST OF PUBLICATIONS, WITH SHORT NOTICES.

1. ABBOTT, C. C. Notes on Hibernating Mammals. Science, iii. p. 538.

With woodcuts of *Vespertilio fuscus*, *Condylura cristata*, and *Hesperomys leucopus*.

2. ADAM, T. Die landwirthschaftliche Hausthierzucht. 2 Aufl. Stuttgart: 1884, 8vo, pp. 1-200. (Cf. Zool. Anz. vii. p. 135.)
3. ALBRECHT, P. Mémoire sur le basiotique, un nouvel os de la base du crâne, situé entre l'occipital et la sphénoïde. Bruxelles: 1883, 8vo, pp. 1-31.

Discovery of a new bone, the basiotic, between the basioccipital and the basisphenoid, and corresponding to the otic bones in the same way as the basioccipital corresponds to the exoccipitals.

4. —. Sur les éléments morphologiques du manubrium du sternum chez les Mammifères. Bruxelles: 1884, 8vo.

Published in the "Livre Jubilaire" of the Société de Médecine de Gand. A *résumé* is given at the end, showing the epiphysial and non-epiphysial elements of the manubrium of the Mammalian sternum.

5. —. Sur la fossette vermienne du crâne des Mammifères. Bruxelles: 1884, 8vo, pp. 1-24.
6. —. Sur les Spondylo-centres epipituitaires du crâne. Bruxelles: 1884, 8vo, pp. 1-33.
7. —. Sur les homodynamies qui existent entre la main et le pied des Mammifères. [Extr. de la Presse méd. belge, No. 42.] Bruxelles: 1884, 8vo.

On the homologies of tarsus and carpus; a table is given at the end showing the correspondence of all the bones.

8. —. Sur la valeur morphologique de la Trompe d'Eustache. Bruxelles: 1884, 8vo, pp. 1-41.
9. —. Note sur la présence d'épiphyses terminales sur le corps des Vertébrés d'un exemplaire de *Manatus americanus*, Desm. Bull. Mus. Belg. ii. [1883] p. 35.

The author shows that the *Sirenia* are no exception to the rule that vertebral epiphyses are present in all but the lowest Mammals.

10. —. Note sur le centre du proatlas chez un *Macacus arctoides*, Geoffr. T. c. p. 287.

Describes the remains of a proatlas vertebra in *Macacus*, such as the same author has found in *Hatteria* and certain other reptiles.

11. AMEGHINO, F. *Oracanthus burmeisteri*, nuevo edentado extinguido de la República Argentina. Bol. Ac. Arg. vii. p. 499.

[See *Megatheriidae*.]

12. APLIN, O. V. Stoats acquiring the Ermine Dress in Mild Seasons. Zool. (3) viii. p. 112.

13. AYERS, H. On the Structure and Development of the Nasal Rays in *Condylura cristata*. Biol. Centralbl. iv. p. 356.

Shows that the sense organs of the nose of the Star-nosed Mole are at a higher stage of differentiation than those of the common Mole.

14. BARDELEBEN, C. Das Os intermedium tarsi der Säugethiere. SB. Jen. Ges. (Jen. Z. Nat. xvii.) pp. 75 & 91.

15. ——. Das Intermedium tarsi der Säugethiere und des Menschen. Biol. Centralbl. iv. p. 374.

In Marsupials the intermedium is found separate, as also in the human embryo, but in the adult man it forms part of the astragalus.

16. BARNES, W. On the Development of the Posterior Fissure of the Spinal Cord and the Reduction of the Central Canal in the Pig. P. Am. Ac. xix. p. 97.

17. BARTLETT, A. D. On some Hybrid Bovine Animals bred in the Society's Gardens. P. Z. S. 1884, p. 399, pls. xxxiv. & xxxv.

Not only were hybrids produced from two animals of different genera, i.e., *Bos indicus*, ♂, and *Bibos frontalis*, ♀; but the ♀ hybrid produced proved to be also fertile with a ♂ *Bison americanus*.

18. BAUR, G. Der Carpus der Paarhufer. Morph. JB. ix. p. 597.

19. ——. Ueber das Centrale carpi der Säugethiere. Op. cit. x. p. 455.

20. ——. Zur Morphologie des Tarsus der Säugethiere. T. c. p. 458.

Gives a table of the homologies adopted by the author: sesamoid = tibiale; astragalus = intermedium.

21. BAYERN, LUDWIG F. [KÖNIGLICHER PRINZ VON]. Zur Anatomie der Zunge. München: 1884, 4to.

A great work on the comparative anatomy of the tongue. [Mammals, pp. 77-90, pls. xxxvi.-lii.]

22. BEAUREGARD, —. Note sur le cœur et le larynx du Cachalot. Mém. Soc. Biol. (8) i. p. 421.

23. BEDDARD, F. E. On some Points in the Structure of *Hapalemur griseus*. P. Z. S. 1884, p. 391.

24. ——. Note on the Presence of an Anterior Abdominal Vein in *Echidna*. P. Z. S. 1884, p. 553; Zool. Anz. vii. p. 653.

The allantoic vein is only a foetal vessel in typical Mammals, but is shown by the author to be present in the adult *Echidna*. It is the primitively left allantoic vessel which survives, showing that in this respect *Echidna* resembles Amphibia and differs from Reptilia, in which the right alone survives.

25. BELLONCI, J. La terminaison centrale du nerf optique chez les Mammifères. Arch. Ital. Biol. vi. p. 405.

26. BENEDEN, E. VAN, & JULIN, C. Recherches sur la formation des annexes fœtales chez les Mammifères (Lapin et Cheiroptères). Arch. Biol. v. p. 369.

The principal result obtained in this paper is that the formation of the amnion in Mammals is almost altogether from the tail end; that the amniotic fold of the head is at first formed of epiblast and hypoblast alone, the mesoblast not having grown round into it; that the formation of the amnion is due to the weight of the embryo, which causes it to subside slowly into the blastodermic vesicle; and that this formation has acquired the appearance of a simple invagination of the surface of what the authors call the blastocyst (*i.e.*, the outer wall of the blastodermic vesicle). A series of ingenious diagrams of the results obtained, beautifully lithographed in colours, is given.

27. BENEDEN, P. J. VAN. Une nouvelle *Balaenoptera rostrata* dans la Méditerranée. Bull. Ac. Belg. (3) viii. p. 713.

Note on the distribution of *Balaenoptera rostrata*.

28. —. Une Baleine fossile de Croatie appartenant au genre *Mésocète*. Mém. Ac. Belg. xlv. pp. 1-29.

Description of the cranial cavity, vertebral column, and a rib, of *Mesocetus agrami*.

29. BIDDULPH, J. On the Wild Sheep of Cyprus. P. Z. S. 1884, p. 593, pl. lviii.

Note on the habits and occurrence of *Ovis ophion*.

30. BIEBER, V. Ein Dinotherium-Skelet aus dem Eger-Franzensbader Tertiärbecken. Verh. geol. Reichsanst. 1884, p. 299.

Interesting discovery of *Dinotherium* in the same beds as *Mastodon*.

31. BIZZOZERO, J., & TORRE, A. A. Ueber die Entstehung der rothen Blutkörperchen bei den verschiedenen Wirbelthierklassen. Arch. path. Anat. xcv. p. 1.

In all growing Vertebrates a continuous formation of blood corpuscles is going on by the indirect division of the already existing young red blood corpuscles. The marrow of the bones forms, in the higher Vertebrates, a special organ for the production of red blood corpuscles.

32. BLANDY, H. Some Points of Interest in the Comparative Anatomy of Teeth. Midl. Nat. vii. p. 29.

33. BLANFORD, W. T. Exhibition of, and Remarks on, a Series of Heads of *Ovis poli*. P. Z. S. 1884, p. 326.

34. BLASIUS, W. *Ellobius tancrei*, sp. n., ein neuer Moll-Lemming oder Wurfmoll aus dem Altai-Gebiete. Zool. Anz. vii. p. 197.

35. —. Ueber eine bisher zu den Zieseln (*Spermophilus*) gerechnete vermuthlich neue Nagethier-gattung aus Turkestan. Tag. Deut. Nat. Vers. 1884, p. 324.

Description of a new genus of Rodents, *Spermophilopsis*, for the species *Spermophilus leptodactylus*, from Turkestan.

36. [*BLASIUS, W.] Der japanische Norz, *Fetorius itatsi* (Temm.), in seinen Beziehungen zu den übrigen Arten der Gattung *Fetorius* im Allgemeinen und der Untergattung *Lutreola* im Besonderen. Ber. Ges. Bamberg, xiii. (Cf. Zool. Anz. viii. p. 255.)
37. BOAS, J. E. V. Ein Beitrag zur Morphologie der Nägel Krallen Hufe und Klauen der Säugethiere. Morph. JB. ix. p. 389.
38. —. Bemerkungen über die Polydactylie des Pferdes. *Op. cit.* x. p. 182.

Boas shows that the presence of a second completely-developed toe on the inside of the horse's leg is not due to atavism, as seems to have been taken for granted; but that since the second metatarsal (*i.e.*, the splint bone) of the same side is always present, the polydactylism is simply due to a doubling of the large third metatarsal with its phalanges.

39. BONNET, R. Beiträge zur Embryologie der Wiederkäuer, gewonnen am Schafei. Arch. Anat. Phys. (Anat.) 1884, p. 170.

Researches on the early stages of development of the Sheep. [Abstract in J. R. Micr. Soc. (2) iv. p. 704.]

40. BOULARD, —, & PILLIETT, —. Note sur l'estomac du Dauphin. J. de l'Anat. Phys. 1884, p. 432.

A description of the stomach of *Delphinus delphis*, showing how it is complicated by the addition of an œsophageal and a duodenal swelling; the true stomach containing only two compartments, a cardiac and a pyloric.

41. *BRANDT, E. [Textbook of the Anatomy of Domestic Mammals. Pt. I. The locomotor apparatus.] (Russian.) St. Petersburg: 1883. (Cf. Zool. Anz. vii. p. 136.)

42. BRAUN, M. Besondere Entwicklungsverhältnisse am Schwanzende von Säugethieren. SB. Ges. Dorp. vi. p. 334.

43. BRAUNS, D. Bemerkungen über die Musteliden Japans, und ihre geographische Verbreitung. Jen. Z. Nat. xvii. p. 452.

44. BRONN, H. G. Klassen und Ordnungen des Thier-Reichs. vi. Säugethiere. Fortgesetzt von Dr. W. Leche in Stockholm. Leipzig und Heidelberg: 1884, 8vo.

Part 27 contains an account of the osteology of the Mammalian pelvis and femur.

45. BROOKE, —. Beitrag zur Lehre über die Genese der Horngebilde. MT. Embr. Inst. Wien, ii. p. 159.

On the development of nails in the human embryo.

46. BRÜCHER, C. Abhandlung über die Vertheilung und Anordnung der Geschmackspapillen auf der Zunge der Hufthiere. Z. f. Thiermed. x. p. 93.

On the normal anatomy of the tongue of Ungulates.

47. BRÜGGER, A. G. Die Chiropteren Graubündens. JB. Ges. Graub. xxvii. p. 26.

General account, with a systematic list at the end; 14 species are enumerated.

48. BRUHL, C. B. Zootomie aller Thierklassen. Lief. 31-33. Wien : 1884, 4to.

Lief. 31 contains diagrams of bones and muscles of the fore-arm, hand, thigh, and foot in man and other Mammals ; lief. 32 contains diagrams of the bones and muscles of vertebral column and ribs of man ; lief. 33, motor apparatus of the head and hyoid in man and the skeleton of fishes.

49. BUNGE, A. Naturhistorische Beobachtungen und Fahrten im Lena-Delta. Aus Briefen an den Akademiker L. v. Schrenck. Bull. Pétersb. xxix. p. 422.

Account of Mammals observed in the Lena-Delta.

50. BURMEISTER, H. Atlas de la description physique de la République Argentine. 2^{me} section : Mammifères. 2^{me} livraison : Die Seehunde der Argentinischen Küsten. Buenos Aires : 1883, folio.

Contains descriptions of *Otaria jubata* and *Arctophoca falklandica* ; with a systematic account of all known species of *Otariidae*.

51. CADIAT, O. Du développement du canal de l'urèthre et des organes génitaux de l'embryon. J. de l'Anat. Phys. 1884, p. 242. [Abstract in J. R. Micr. Soc. (2) iv. p. 706.]

On the development of the generative organs in embryos of sheep and man.

52. CALDWELL, W. H. On the Arrangement of the Embryonic Membranes in Marsupial Animals. Q. J. Micr. Sci. xxiv. p. 655.

A preliminary account, written from Australia. The main point is that there is never any vascular connection between the embryo and the uterine walls ; the embryo is attached to the uterine wall by pseudopodia like processes of the wall of the blastodermic vesicle on the side of the yolk-sac, not on that of the allantois ; so that there is not the slightest trace of a placenta.

53. —. Telegram to Prof. Moseley at Montreal, announcing the discovery of the eggs of *Ornithorhynchus*, i.e., "Monotremes oviparous, segmentation meroblastic." Rep. Brit. Ass. 1884, p. 777.

54. CAMERANO, L. Recherche intorno all'anatomia di un feto di *Otaria jubata* (Forster). Mem. Acc. Tor. (2) xxxv. p. 1.

55. CAPELLINI, G. D. Zifioide fossile (*Chenoziphius planirostris*, Cuv.) scoperto nelle sabbie plioceniche di Fangonero presso Siena. Atti Acc. Rom. (4) i. p. 6.

56. CATON, J. D. The Antelope and Deer of America : a comprehensive Scientific Treatise upon the Natural History, including the Characteristics, Habits, Affinities, and Capacity for Domestication of the *Antilocaprae* and *Cervidae* of North America. 2nd edition. New York : 1884, 8vo.

57. —. Abnormal Deer Antlers from Texas. Am. Nat. xviii. p. 733.

The antlers are palmated, but probably belong to *Cariacus virginianus*.

58. CHANTRE, E. Rapport sur une Mission scientifique dans l'Asie Occidentale. Arch. Miss. sci. (3) x. p. 199.

Contains a list of 22 Mammals obtained, chiefly in the Caucasus and Transcaucasia.

59. CHOUQUET, M. Sur la présence de l'*Elephas primigenius* dans les alluvions de Chelles. Bull. Soc. Anthr. (3) vii. p. 392.

60. CIACCIO, G. Osservazioni anatomiche comparative tra gli occhi della talpa illuminata e quelli della cieca. Rend. Acc. Bologn. 1883-84, p. 74.

- 60A. —. Se il vitreo nella fossetta centrale della retina si profondi in modo da riempirla, ovvero se la cuopra solamente, lasciandola vuota. T. c. p. 74.

61. CLARK, J. W. On a Sea-Lion from the East Coast of Australia (*Otaria cinerea*, Péron). P. Z. S. 1884, p. 188.

Gives a full description of the species, and a history of its name, illustrated by several woodcuts.

62. CLARKE, W. E., & ROEBUCK, W. D. Notes on the Vertebrate Fauna of Yorkshire [Mammals]. Zool. (3) viii. p. 171.

63. CLAUS, C. Traité de Zoologie; deuxième édition française, traduit de l'Allemand par G. Moquin-Tandon. Paris: 1884, 8vo.

By far the best edition of Claus's Zoologie, since in it are incorporated both the Grundriss and the Lehrbuch, as well as much additional information and many new figures.

64. CLELAND, J. Notes on the Viscera of the Porpoise (*Phocaena communis*) and White-Beaked Dolphin (*Delphinus albirostris*). J. Anat. Phys. xviii. p. 327.

65. COCKS, A. H. The Fin-Whale Fishery on the Coast of Finmark. Zool. (3) viii. pp. 366, 417, & 455.

Interesting accounts of the capture of the Humpback Whale (*Megaptera boops*), the common Rorqual (*Balenoptera musculus*), and *Balenoptera sibbaldii*, off the coast of Finmark.

66. COHNSTEIN, J., & ZUNTZ, N. Untersuchungen über das Blut den Kreislauf und die Athmung beim Säugethier-fötus. Arch. Ges. Phys. xxxiv. p. 173.

On the comparative physiology of the foetal circulation.

67. COLLETT, R. *Echidna acanthion*, en sandsynligvis ubeskreven Art Myre-Pindsvin fra Nord-Queensland. Forh. Selsk. Chr. 1884, No. 13.

Description of *Echidna acanthion*, sp. n., from N. Queensland.

68. —. Om Baeveren (*Castor fiber*), og dens Udbredelse i Norge fordum og nu. N. Mag. Naturv. xxviii. p. 11.

On the localities, recent and historic, of the Beaver in Norway.

69. —. On some apparently new Marsupials from Queensland. P. Z. S. 1884, p. 381, pls. xxix.-xxxii.

The discovery of *Dendrolagus* in Queensland is very interesting, as this genus has hitherto been recorded only from New Guinea. [See *Phalungistidae* and *Macropodidae*.]

70. COPE, E. D. The *Vertebrata* of the Tertiary Formations of the West. Book I., in the Report of the United States Geological Survey of the Territories, by F. V. Hayden, vol. iii. Washington : 1884.

This large volume contains, in the first part, an account of the Mammalian fauna of the Puerco, Wasatch, and Bridger periods of the Lower Tertiaries; the second part consists of the faunæ of the White River and John Day periods. Among his most important finds the author reckons the Marsupial *Plagiaulacida*, the aberrant *Creodonta*, the *Condylarthra*, and the phylogenetic series of the *Canidae* and *Felidae*.

71. —. Second Addition to the Knowledge of the Puerco Epoch. P. Am. Phil. Soc. xxi. p. 309.

Contains descriptions of new species of Puerco Mammals : *Didymictis primus*, *Triisodon rusticus*, *T. assurgens*, *Mioclenus cuspidatus*, *Chriacus truncatus*, and *C. simplex*, all Creodonts; *Tricentes crassicollidens*, g. & sp. nn., *T. inæquidens*, *Indrodon malaris*, g. & sp. nn., all Lemurs; *Anisonchus agapetillus* and *A. cophator*, Condylarthrans; and *Chirox plicatus*, g. & sp. nn., and *Catopsalis fissidens*, Marsupials.

72. —. On the Trituberculate Type of Molar Teeth in the *Mammalia*. T. c. p. 324.

Showing that the trituberculate is the primitive type of tooth; that it is found in nearly all the fossil Mammals from the Puerco or Lower Eocene; finally, that it persists now only in Marsupials, Creodonts, and some Carnivores.

73. —. Synopsis of the Species of *Oreodontidae*. T. c. p. 503.

A review of the *Oreodontidae*, a rather aberrant family of the *Ruminantia*. Nine new species are described. They first appear in the White River epoch, and die out in the Loup Fork epoch, both of the Miocene.

74. —. On New Lemuroids from the Puerco Formation. Am. Nat. xviii. p. 59.

The *Adapidae* from Puerco, on account of their foot-structure, must be put among the insectivorous *Bunotheria*. Those genera with three and two superior premolars remain in the *Lemuroidea*, of which there are two Eocene families: (1) *Mirodectidae*, with three superior premolars, containing the genera *Tricentes*, *Necrolemur*, *Mirodectes*, *Microsyops*, and *Cynodontomys*; (2) *Anaptomorphidae*, with two superior premolars, containing the genera *Indrodon* and *Anaptomorphus*.

75. —. The *Creodonta*. T. c. pp. 255, 344, & 472.

These animals evidently represent the *Carnivora* in Eocene times; but that they are not *Carnivora* is evident from the absence of a scapholunar bone, from their ungrooved astragalus and smooth cerebral hemispheres. They also differ widely from the Carnivorous Marsupials; from the Insectivores, however, they differ in no essential particulars. The *Creodonta* are arranged, with *Insectivora*, *Tillodonta*, and *Teniodonta*, and 2 other suborders, under a new order, *Bunotheria*. Their definition is as follows:—Neither incisor nor canine teeth growing from persistent pulps, hallux not opposable, superior true molars tritubercular or more simple. Of the 9 families, 5 are extinct, and of each of these the author treats in

detail. They are the *Mesonychidae*, *Hyænodontidae*, *Leptictidae*, *Oxyenidae*, and *Miacidae*; all three families, except the *Hyænodontidae*, are confined to the Lower Eocene.

76. [COPE, E. D.] The Mastodons of North America. *T. c.* p. 524.

A synopsis, with notes on the 9 species of *Mastodon* that have been inhabitants of North America, with descriptions of *M. serridens* and *M. culypodon*.

77. —. The Tertiary *Marsupialia*. *T. c.* p. 686.

There are 3 types of extinct Marsupials, the carnivorous type (*Sarcophaga*, Owen), the herbivorous type (*Poëphaga*, Owen), and a third type (*Multituberculata*, Cope), characterized by "at least three longitudinal series of tubercles in its superior molar teeth." The author gives an account of 3 families, *Tritylodontidae*, *Polymastodontidae*, and *Plagiulacidae*, all belonging to the *Multituberculata*.

78. —. The *Condylarthra*. *T. c.* pp. 790 & 892.

The *Condylarthra*, combined with the *Hyracoidea*, make up the new order *Taxeopoda*. The *Condylarthra* contain 3 families—*Periptychidae*, *Phenacodontidae*, and *Meniscotheriidae*. These forms are all 5-toed, both before and behind; their dentition is either bunodont or lophodont; they form the most primitive stock of the modern Ungulates, and they are all confined to the Puerco and Wasatch beds of the Lower Eocene.

79. —. Observations on the Phylogeny of the *Artiodactyla* derived from American fossils. *T. c.* p. 1034.

The author would derive the Artiodactyle phylum from a tritubercular Bunodont, such as *Pantolestes*.

80. —. The *Amblypoda*. *Op. cit.* xviii. pp. 1110 & 1192; xix. p. 40.

The *Amblypoda* forms an extinct order of Ungulate Mammals, in which the internal bones of the carpus are in a linear series. There are 3 suborders:—(1) *Taligrada*, with one genus, *Pantolambda*, of Cope; (2) the *Pantodonta*, containing the family *Coryphodontidae*; (3) the *Dinocerata* (for which see Marsh's Monograph).

81. —. The Origin of the *Mammalia*. *Op. cit.* xviii. pp. 1136–1154.

The author derives the *Mammalia* from the Pelycosaurian *Reptilia*, and not from *Batrachia*.

82. CORNELI, R. Der Fischotter, dessen Naturgeschichte, Jagd, und Fang. Berlin: 1884, 8vo.

A sporting account of the Otter and Otter-hunting.

83. COUES, E. *Thomasomys*, a new subgeneric type of *Hesperomys*. *Am. Nat.* xviii. p. 1275.

Thomasomys is proposed for two species of *Hesperomys*, *H. cinereus* and *H. taczanowskii*.

84. CURIE, E. Sur la communication directe placentaire de la mère au fœtus. *Mém. Soc. Biol.* (8) i. p. 733.

85. —. Nouvelles remarques sur les communications vasculaires de la mère au fœtus dans le placenta des rongeurs. *T. c.* p. 736.

86. D'ARCY, —. Le Mammoth dans le forest bed de Cromer. Bull. Soc. Anthr. (3) vii. p. 452.

87. DAMES, —. Ueber Renthierreste von Rixdorf bei Berlin. SB. nat. Fr. 1884, p. 49.

88. DAVIES, W. Notes on some New Carnivores from the British Eocene Formations. Geol. Mag. (3) i. p. 433.

Descriptions of *Viverra hastingia*, sp. n., and *Argillotherium taliapicum* (g. incert. sed. n. & sp. n.), both from the Eocene beds, the former of Hordwell, the latter of Sheppey.

89. *DEBIERRE, C. Développement de la vessie, de la prostate, et du canal de l'urèthre. Paris: 1883. (Cf. Zool. Anz. vii. p. 137.)

90. *DEMON, F. Développement de la portion sous-diaphragmatique du tube digestive. Lille: 1883. (Cf. Zool. Anz. vii. p. 136.)

91. DENIKER, J. Sur un fœtus du Gorille. C.R. xcviii. p. 753.

Descriptive of external characters and measurements only.

92. DEPERET, C. Nouvelles études sur les Ruminants pliocènes et quaternaires d'Auvergne. Bull. Soc. Géol. (3) xii. p. 247.

List of the pliocene and quaternary *Bovidae*, *Cervidae*, and *Antelopidae*, from Auvergne.

93. DOBSON, G. E. On the Myology and Visceral Anatomy of *Capromys melanurus*, with a description of the species. P. Z. S. 1884, p. 233, pls. xviii.-xxi.

The author shows that *C. melanurus*, Peters, differs from its nearest ally of the anatomy of which we have any knowledge, in two important matters—(1) the absence of the sub-division of the hepatic lobes; (2) the presence of two pre-caval veins.

94. —. On the unimportance of the presence or absence of the hallux as a generic character in Mammalogy, as shown by the gradual disappearance of this digit within the limits of a single genus. T. c. p. 402.

There is a regular gradation in the size of the hallux in the genus *Erinaceus*, from the large hallux of *E. europæus* down to *E. diadematus*, in which it is only 4 mm. long. *E. albiventris* has no traces of the hallux at all in the adult, but in a young ♀ the author discovered a distinct digit with its appertaining muscles.

95. —. On some Peculiarities in the Geographical Distribution and in the Habits of certain Mammals inhabiting Continental and Oceanic Islands. Ann. N. H. (5) xiv. p. 153.

The author concludes that there must have been a chain of islands from Madagascar to Australia, to account for the resemblance of their respective Chiropterous faunæ; also that the supposed resemblance between the *Insectivora* of the West Indies and those of Madagascar no longer exists, since *Solenodon* has been shown to be no more allied to the *Centetidae* than to the Hedgehogs or Moles.

96. [DOBSON, G. E.] On the presence of Peyer's Patches (glandulæ agminatæ) in the cœcum and colon of certain Mammals. J. Anat. Phys. xviii. p. 388.

Peyer's patches, generally supposed to be confined to the small intestine, have been found by the author in the colon and cœcum of many species of *Rodëntia* and *Insectivora*.

97. —. On the comparative variability of bones and muscles, with remarks on unity of type in variations of the origin and insertion of certain muscles in species unconnected by unity of descent. *Op. cit.* xix. p. 16.

The author shows that muscles are really very permanent structures, more permanent and less variable than bones; of this he gives several instances. He also shows how 2 fossorial animals, an Insectivore (*Talpa*) and a Rodent (*Bathyergus*), have each acquired separately the same modification of the deep flexor muscles of the fore-foot; and asks if this can be due to natural selection.

98. DUBOIS, A. Description d'un Échidné et d'un Perroquet inédits de la Nouvelle-Guinée. Bull. Mus. Belg. iii. p. 109.

Description of a supposed new species of *Echidna* (*Proechidna villosissima*). The latter name for the genus is adopted, because *Acanthoglossus* is already occupied by a genus of Insects.

99. DURY, C. North American *Leporidae*. J. Cincinn. Soc. vii. p. 78.

Gives a list of the North American species of *Lepus*, both recent and extinct.

100. DÜSING, C. Die Regulierung des Geschlechtsverhältnisses bei der Vermehrung der Menschen Tiere und Pflanzen. Jen. Z. Nat. xvii. p. 592.

Account of the author's theory of sex.

101. EHLMANN, S. Ueber Fettgewebsbildung aus dem als Winterschlafdrüse bezeichneten Fettorgane. SB. Ak. Wien, lxxxvii. (Abt. iii.) p. 88.

On the formation of fat and the fat-organ in the Bat.

102. EIMER, T. Ueber die Zeichnung der Thiere. 2te Mitth. Raubthiere. Zool. Anz. vii. pp. 13, 34, & 56.

A continuation of Prof. Eimer's researches on the evolution of the colour markings of animals. This paper is devoted to the colour markings of the Cats, especially of the domestic Cat.

103. ELLENBERGER, W. Histologie der Haussäugethiere. (Erster Theil.) Berlin: 1884, 8vo.

A textbook on histology. In the first chapter the various methods of modern histology are described, and in the second chapter the application of those methods to special tissues and organs; then follow chapters on the cell and the tissues; the part concludes with chapters on the urinary and generative systems.

104. ELLIOTT, H. W. The Monk-Seal of the West Indies (*Monachus tropicalis*, Gray). Science, iii. p. 752.

Note on the rediscovery of this rare Seal on the coast of Cuba. Only two specimens are said to exist: the one here described, which is now in the Smithsonian Institution, and one in the British Museum.

105. EXNER, S. Die Innervation des Kehlkopfes. Anz. Ak. Wien, 1884, p. 35.

106. —. Bemerkung über die Bedeutung der feuchten Schnauze der mit feinem Geruchsinne ausgestatteten Säuger. Z. wiss. Zool. xl. p. 557.

107. FILHOL, H. Description d'un nouveau genre d'Insectivore fossile. Bull. Soc. Philom. (7) viii. p. 62. [See *Insectivora*, gen. incert. sed.]

108. —. Note sur une nouvelle espèce d'Insectivore du genre *Amphisorex*. T. c. p. 63.

109. —. Note sur un nouveau genre et une nouvelle espèce de Pachyderme fossile. T. c. p. 64.

The new genus (*Oxacron*) is allied to *Cainotherium*.

110. —. Description d'une nouvelle espèce de Rongeur fossile. T. c. p. 64. [See *Sciuridae*.]

111. —. De la restauration du squelette d'un *Dinocerata*. Ann. Sc. géol. xvi. p.

112. FISCHER, J. Études Psychologiques sur les Singes. Rev. Montp. (3) iii. p. 336.

A rather amusing account of the study of the habits and manners of Monkeys. The author comes to the conclusion that Monkeys are far the most intelligent of all animals after man, with the exception, perhaps, of Dogs, which have had the advantages of domestication so long.

113. FLEMMING, W. Zur Kenntniss der Regeneration der Epidermis beim Säugethiere. Arch. mikr. Anat. xxiii. p. 148.

114. FLESCHE, M. La courbure nucale de la moelle épinière. Arch. Sci. nat. (3) xii. p. 450.

115. —. Sur l'hypophyse du cerveau chez le cheval. T. c. p. 452.

116. FLOWER, W. H. Catalogue of the Specimens illustrating the Osteology and Dentition of Vertebrated Animals contained in the Museum of the Royal College of Surgeons of England. Part ii. *Mammalia*. London: 1884, 8vo.

No less than 3972 separate osteological specimens are described, belonging to 726 different species of Mammals.

117. —. Narwhal. Encycl. Brit. xvii. p. 235.

118. —. Note on the Dentition of a young Capybara (*Hydrochærus capybara*). P. Z. S. 1884, p. 252.

119. —. Note on the Names of Two Genera of *Delphinida*. T. c. p. 417.

Prodelphinus of Gervais must be substituted for *Clymenia* or *Clymene* of Gray; *Globicephala*, the old name, must take the place of *Globiceps*.

120. FOL, H. Résultats de l'étude sur un embryon humain. Arch. Sci. nat. (3) xi. p. 93.

Observations on a human embryo of three weeks; an embryo of such an age has never been before studied; there were three branchial slits and two aortic arches.

121. *FONTANNES, F., & DEPERET, C. Étude sur les alluvions pliocènes et quaternaires du plateau de la Bresse, dans les environs de Lyon. Suivie d'une Note sur quelques Mammifères des alluvions préglaciaires de Sattonay. Lyon: 1884, 8vo. (Cf. Zool. Anz. viii. p. 250.)

122. FORSYTH-MAJOR, C. J. [See MAJOR, C. J. FORSYTH.]

123. GAUDRY, A. Sur un Sirénien d'espèce nouvelle trouvé dans le bassin de Paris. C.R. xcvi. p. 777; Bull. Soc. Géol. (3) xii. p. 372.
Description of *Halitherium chouqueti*.

124. GEGENBAUR, C. Ueber die Unterzunge des Menschen und der Säugethiere. Morph. JB. ix. p. 428.

On the anatomy of the sub-lingua of Mammals.

125. —. Zur näheren Kenntniss des Mammarorgans von *Echidna*. T. c. p. 604.

126. —. Zur Morphologie des Nagels. Op. cit. x. p. 465.

Contains a general account of Vertebrate claws and nails, more especially dealing with those of the lower Vertebrates.

127. GREFFBERG, W. Die Haut und deren Drüsen in ihrer Entwicklung. MT. Embr. Inst. Wien, ii. p. 125.

128. GREWINGK, C. Nachtrag zum Verzeichniss quartärer ganz und local ausgestorbener Säugethiere. SB. Ges. Dorp. vi. p. 4.

Note on the discovery of *Elephas primigenius*, *Bos primigenius*, *Rangifer tarandus*, and *Equus fossilis*, in the Baltic Provinces of Russia.

129. GRIMM, J. [See WALDEYER, W.]

130. GRONEN, D. Der Schwarz- und Langschwanzhirsch. Zool. Gart. 1884, p. 20.

Note on the distribution of *Cariacus macrotis* and *C. leucurus* in North America.

131. GULDBERG, G. A. Sur l'existence d'une quatrième espèce du genre *Balanoptera* dans les mers septentrionales de l'Europe. Bull. Ac. Belg. (3) vii. p. 360.

Contains measurements, descriptions, and account of the habits of the little-known *Balanoptera borealis*, Lesson.

132. —. Sur la présence aux temps anciens et modernes de la Baleine de Biscaye (ou Nordcaper) sur les côtes de Norwège. T. c. p. 374.
(See also Nature, xxx. p. 148.)

Discovery of the bones of *Balæna biscayensis*, Eschricht, in Finmark, with descriptions and measurements.

133. GUNN, R. M. On the Eye of *Ornithorhynchus paradoxus*. J. Anat. Phys. xviii. p. 400.

The eye of *Ornithorhynchus* is provided with a hyaline cartilaginous sclerotic and a well-developed nictitating membrane. The optic nerve does not contain a central blood vessel; but the large posterior ciliary vessels supply the choroid; and by this blood-supply the retina and the vitreous chamber would seem to be nourished, since there seem to be no blood vessels in the retina itself.

134. GÜNTHER, A. Note on some East African Antelopes supposed to be new. Ann. N. H. xiv. p. 425.

Description of *Alcelaphus cokii* and *Gazella thomsonii*, spp. nn.

135. HAACKE, W. Meine Entdeckung des Eierlegens der *Echidna hystrix*. Zool. Anz. vii. p. 647.

Dr. William Haacke urges his claims to priority in the discovery that *Echidna* is oviparous.

136. HAGEN, H. A. Notes on the American Badger (*Taxidea americana*). Q. J. Bost. Zool. Soc. ii. p. 29.

Notes on its habits made in Washington Territory.

137. HAHN, —. De la présence de galets dans l'estomac des otaries (*Otaria jubata*). Mém. Soc. Biol. (8) i. p. 4.

138. HARTING, J. E. Note on the Roedeer (*Capreolus caprea*) in Dorsetshire. P. Z. S. 1884, p. 152.

139. —. Dogs: Ancient and Modern. Zool. (3) viii. p. 33.

On the types of the different breeds of Dogs, and their derivation from one or more wild species of *Canis*.

140. —. On the Growth of Deer-horns, with Reference to some Abnormal Antlers of the Roe. T. c. p. 353.

With quotations from a pamphlet on the growth of the horns of the red deer, by J. Clarke Lynton, published at Barnstaple, 1866.

141. HECTOR, J. Notes on the Dolphins of the New Zealand Seas. Tr. N. Z. Inst. 1884, p. 207.

11 species are described as occurring in New Zealand seas.

142. HENLE, J. Das Wachsthum des menschlichen Nagels und des Pferdehufs. Abh. Ges. Götting. xxxi. pp. 1-48, pls. i.-v.

A histological memoir, accompanied by beautifully-coloured plates.

143. HERMANN, F. Beitrag zur Entwicklungsgeschichte des Geschmacksorgans beim Kaninchen. Arch. mikr. Anat. xiv. p. 216.

144. HERMES, —. Ueber das in Berliner Aquarium ausgestellte Walross. SB. nat. Fr. 1884, p. 67.

145. HEUDE, —. Catalogue des Cerfs tachetés (Sikas) du Musée de Zikawei, ou notes préparatoires à la monographie de ce groupe. Zikawei: 1884, 4to.

Heude divides up *Cervus sika* into no less than 37 new species, all of which are here described in detail. The names are given under *Cervus sika*.

146. [HEUDE, —.] Annonce qu'il a découvert un nouveau species de *Hydropotes*. C.R. xviii. p. 1017.

There is no description, but the species is named *H. argyropus*.

147. HIGGINS, E. T., & PETTERD, W. F. Descriptions of New Tasmanian Animals. P. R. Soc. Tasm. 1883 [1884] p. 181.

[See *Muridæ*, *Dasyuridæ*, and *Macropodidæ*.]

148. —, & —. New Species of Tasmanian *Antechini* and *Mus*. T. c. p. 184.

149. —, & —. Description of a New Species of *Mus*, with a List of the Terrestrial Animals of Tasmania. T. c. p. 195.

42 Mammals in all, of which 26 are peculiar to the island.

150. HILGENDORF, —. Vorlegung von Zahnschliffen mehrere *Lepus* Arten. SB. nat. Fr. p. 18.

151. HOERNES, R. Elemente der Palæontologie. Leipzig : 1884, 8vo. [Mammalia, pp. 517-570.]

152. HOFMANN, A. Säugethierreste aus der Stuhleck-Höhle. MT. Ver. Steierm. 1884, p. 3.

On the occurrence of *Ursus spelæus*, *U. arctos*, et al., in Stuhleck.

- at 153. HOGGAN, G. New Forms of Nerve Terminations in Mammalian Skin. J. Anat. Phys. xviii. p. 182. (Also J. de l'Anat. Phys. 1884, p. 265.)

Histological researches, and descriptions of three new forms of nerve termination found in the skin of the Raccoon (*Procyon lotor*). Dr. Hoggan calls the three forms—(1) the Browne body, homologous with the forked nerve termination on the follicles of ordinary hairs; (2) the Hoggan body, shaped like a Pacinian body, intermediate between it and the Browne body; (3) Blackwell body, standing midway between Meissner's body and the sub-epidermic ganglia of nerve cells.

154. HORNADAY, W. T. Brief Directions for Removing and Preserving the Skins of Mammals. P. U. S. Nat. Mus. vi. p. 485.

155. HUGHES, T. H. An Incident in the Habits of the *Semnopithecus entellus*, the common Hanuman Monkey. P. A. S. B. 1884, p. 147.

- 155A. HUET, M. Note sur une espèce nouvelle de *Chrysochlore* de la côte du Golfe de Guinée, et sur les Insectivores du même genre faisant partie de la collection du Muséum d'Histoire Naturelle. N. Arch. Mus. (2) vi. pp. 1-16, pl. i.

After general remarks upon the specimens of *Chrysochloris* in the Paris Museum, M. Huet describes a new species, *C. leucorhina*, from the Guinea coast. The dentition is that of typical *Chrysochloris* with forty teeth, but in other respects the characters are intermediate between *Chrysochloris* and *Chalcochloris*, which M. Huet is disposed to unite accordingly.

156. IHIERING, H. VON. Mehrzehige Pferde. Kosmos : 1884, i. p. 99.

Description of a polydactylous Horse from Rio Grande do Sul.

157. *IMBERT, G. Développement de l'utérus et du vagin. Paris : 1883.
(Cf. Zool. Anz. vii. p. 137.)

157A. JAGGARD, W. N. *Mesoplodon layardi*. P. R. Soc. Queensl. i. p. 58.
First notice of this Whale off the Coast of Queensland.

158. JEFFERIES, R. Red Deer. London : 1884, 8vo.

Account of the habits of the Red Deer in England.

159. JENTINK, F. A. De olifant en de rhinoceros op Borneo. Leyden : 1884, 8vo.

Note as to the truth of the occurrence of the Rhinoceros and Elephant wild in Borneo.

160. —. On the species of the Phalanger genus *Pseudochirus*. Notes Leyd. Mus. vi. p. 108. [See *Phalangistidae*.]

161. —. On *Didelphys candivolula*, Kerr, and *Didelphys vulpecula*, Kerr. Op. cit. vii. p. 21.

The author identifies *Didelphys candivolula*, Kerr, with *Pseudochirus cooki*, Desm., and *Didelphys vulpecula*, Kerr, with *Trichosurus vulpinus*, Shaw, and claims priority for Kerr's names.

162. JOHNSTON, H. H. The River Congo, from its Mouth to Bólóbó. London : 1884, 8vo.

Chapter xv. contains an account of the Mammals observed, and concludes with a list of Congo Mammals.

163. JOLY, N. Études de Psychologie comparée. Mém. Ac. Toulouse (2) vi. p. 172.

164. JOUAN, H. Note sur quelques Cétacés capturés ou échoués sur les côtes de l'Europe de 1879 à 1885. Mém. Soc. Cherb. xxiv. p. 305.

165. KINGSLEY, J. S. The Standard Natural History [edited by]. v. Mammals. Boston : 1884, 4to.

A popular natural history, with many illustrations; among the contributors are Elliott Coues and Theodore Gill.

166. KIRK, [Sir] J. On the Occurrence of *Colobus kirkii*. Ann. N. H. (5) xiii. p. 307.

Note on this Monkey, which was confined to Zanzibar and Pemba Islands. It appears to be nearly exterminated.

167. KOBER, J. Mittheilungen über den Maulwurf. JH. Ver. Württ. 1884, p. 60.

Observations on the habits and structure of the Mole.

168. —. Studien über *Talpa europæa*. Verh. Ges. Basel, vii. p. 465.

On the milk and permanent dentition of the Mole. Milk formula

$$\frac{3.1.4 + 2}{4.1.3 + 2} \quad \text{Permanent formula} \quad \frac{3.1.4 + 3}{4.1.3 + 3}$$

169. KOERNER, O. Weitere Beiträge zur vergleichenden Anatomie und Physiologie des Kehlkopfs. Abh. senck. Ges. xiii. p. 261.

A supplement to a former paper on the same subject [cf. Zool. Rec. xx. Mamm. p. 15].

170. KÖLLIKER, A. Grundriss der Entwicklungsgeschichte des Menschen und der höheren Tiere. Zweite umgearbeitete Auflage. Leipzig : 1884, 8vo.

Second edition of the well-known work, with many additions and corrections.

171. *KÖPPEN, F. T. Ueber die Verbreitung einiger Säugethiere in Russland, insbesondere in der Krim, mit Bemerkungen zur Herpetologia Taurica. — St. Petersburg : 1884, 8vo. (Cf. Zool. Anz. viii. p. 250.)

172. —. Das Fehlen des Eichhörnchens und das Vorhandensein des Rehs und des Edelhirsches in der Krim. Beitr. Russ. Reiches. 2^{te} Folge. Bd. vi. [Cf. Zool. Rec. xix. Mamm. p. 9.]

173. —. Nachschrift zum Aufsatz: "Das Fehlen des Eichhörnchens, &c., in der Krim." Beitr. Russ. Reiches. 2^{te} Folge. Bd. vi. p. 107.

A supplement to the above essay on Crimean Mammals. The author shows that the Crimea derives its Mammals from the Caucasus, and the Caucasus again from Central Asia. In this way the absence of well-known European forms from the Crimea is accounted for. In the former paper (172), a comparative list of the Mammalian Fauna of Sardinia and the Crimea is given.

174. KRAMBERGER, D. G. Fosilni sisari Hrvatske, Slavonije i Dalmacije. Rad. Jugo Ak. lxix. p. 60.

Contains a list of fossil Mammals found in Slavonia and Dalmatia.

175. KRAUSE, W. Die Anatomie des Kaninchens in topographischer und operativer Rücksicht bearbeitet. Zweite Auflage. Leipzig : 1884, 8vo.

A second edition of this complete account of the anatomy of the Rabbit.

176. KRAUSHAAR, R. Entwicklung der Hypophysis und Epiphysis bei Nagethieren. Z. wiss. Zool. xli. p. 79.

Gives a historical account of the hypophysis and epiphysis (pineal gland); also the results of the author's own researches. Most of the embryos used were those of the Mouse.

177. KRAUSS, —. Ueber eine weissliche Varietät des Fuchses. JH. Ver. Württ. 1884, p. 50.

178. KUHN, J. Fruchtbarkeit der Gayalbastarde [*Bos frontalis*]. Z. landwirthsch. Central-Ver. Sachsen, 1884; Biol. Centr. iv. p. 766.

179. —. Geburt eines Yak-Sanga-Bastardes. Naturforscher, xvii. p. 126.

180. LACHI, P. De la membrane granuleuse ovarienne et de ses éléments. Arch. Ital. Biol. vi. p. 62.

181. LANDOIS, H. Ueber einen fossilen westfälischen Pferdeschädel (*Equus caballus*, L.). JB. Westf. Ver. 1883, p. 10.

182. [LANDOIS, H.] Ueber den Hund als grösste Parasitenherberge. *T. c.* p. 16.

Gives a list of some of the best-known parasites of the Dog.

183. —. Ueber einen Igel-Albino. *T. c.* p. 20.

Account of a white Hedgehog.

184. LATASTE, F. Description d'une espèce nouvelle de Gerbilline d'Arabie (*Meriones longifrons*). *P. Z. S.* 1884, p. 88, pls. vi. & vii.

Includes a long account of the habits of the 3 species described.

185. —. Catalogue provisoire des Mammifères sauvages non marines du département de la Gironde. *Act. Soc. L. Bord.* (4) viii. p. 11.

The list is preceded by a table by which the genus of any Mammal in question can be at once identified; this is followed by a list of the species, with their synonyms and localities.

186. LAVOCAT, A. Du rachis dans la série des animaux vertébrés. *C.R.* xcix. p. 1125.

187. —. Ceinture scapulo-claviculaire des Vertébrés. *Mém. Ac. Toulouse*, vi. p. 1.

The author tries to show that the coracoid is situated in front of the clavicle, so that the clavicle of Birds and Monotremes is really *the* coracoid.

188. —. Transformation progressive des Quadrumanes. *T. c.* p. 128.

189. LAULANIE, M. F. De la spermatogénèse chez le cheval. *Bull. Soc. Toulouse*, xviii. p. 139.

190. LEBOUCC, H. Recherches sur la Morphologie du carpe chez les Mammifères. *Arch. Biol.* v. p. 35.

The first part contains an account of the development of the centrale of the carpus in man, and of its ultimate fate; it is found that in the majority of cases the centrale persists, fused to the scaphoid. A short account is also given of the development of the centrale in other Mammals; and where it is not present in the adult, it is shown to be fused with the radiale to form the scaphoid. The second part deals with the development of the pisiform bone, showing that there are two distinct bones known as pisiform: (1) a true carpal bone, (2) a sesamoid. The third part, containing general considerations, asserts that the primitive axis does not pass all along the radial side of the forelimb, as is supposed by Gegenbaur, but from the humerus, along the ulna, then obliquely through the intermedium and centrale, to the first metacarpal and digit.

191. LECHE, W. Dr. H. G. Bronn: Klassen und Ordnungen des Thier Reichs. [See BRONN.]

192. —. On some New Species of *Chiroptera* from Australia. *P.* 1884, p. 49.

The occurrence of *Nyctinomus plicatus*, hitherto only recorded and the Oriental region, in S. Australia and N. Tasmania, is now Rec. *Chiroptera*.]

193. [LECHE, W.] Zur Anatomie der Beckenregion bei *Insectivora*. Sv. Ak. Handl. xx. No. 4.

An important paper on the osteology, neurology, and myology of the pelvic region in the *Insectivora*.

194. —. Das Vorkommen und die morphologische Bedeutung des Pfannenknöchens (os acetabuli). Intern. J. f. Anat. Hist. i. p. 363.

An essay on the acetabular bone in the *Mammalia*. It appears to be ossified much later than the other parts of the pelvis.

195. *LEGGE, F., & LANZILLOTT-BUONSANTI, A. Contribuzione allo Studio delle Circonvoluzioni cerebrali del cavallo. Milano: 1884. (Cf. Zool. Anz. viii. p. 254.)

196. *LEISERING, A. G. T., & MÜLLER, C. Handbuch der vergleichenden Anatomie der Haussäugethiere. Berlin: 1884, 8vo. (Cf. Zool. Anz. viii. p. 232.)

197. LEMOINE, V. Caractères généraux du *Pleuraspidotherium*, Mammifère de l'éocène inférieur des environs de Reims. C.R. xcix. p. 1090.

Notes on this genus, which apparently has relationship to both the *Palæotheria* and Marsupials.

198. LENZ, H. O. Die Säugethiere. 6 Aufl. bearbeitet von Prof. O. Burbach. Gotha: 1884, 8vo, pp. 1-717, pls. i.-xii.

A general account of the *Mammalia*, illustrated with poorly-coloured plates.

199. LIEBERKÜHN, N. Ueber die Chorda bei Säugethieren. Arch. Anat. Phys. (Anat.) 1884, p. 435.

On the development of the notochord in the Guinea Pig.

200. LOEWIS, O. VON. Schwarze Eichhörnchen. Zool. Gart. 1884, p. 202.

On the distribution of the black variety of the common Squirrel, and the causes of its melanism.

201. *LÖWE, L. Beiträge zur Anatomie und zur Entwicklungsgeschichte des Nervensystems der Säugethiere und des Menschen. 2 Bd. Die Histologie und Histogenese des Nervensystems, nebst einem Anhang: Die Schädelwirbeltheorie. 1 Lfg. Leipzig: 1883. (Cf. Zool. Anz. vii. p. 137.)

202. LUCHSINGER, B. Zur Theorie des Wiederkauens. Arch. ges. Phys. xxxiv. p. 295.

LUDWIG, F. [See BAYERN (21).]

203. LUDWIG, H. Die Wirbelthiere Deutschlands. Hannover: 1884, pp. 1-200.

A handbook of the Vertebrate fauna of Germany, with a short description of each species, and tables for easily identifying them.

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Notes on the habits of the animals described by Dr. Robert Collett. [See COLLETT (69).]

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Notes on the habits of the animals described by Dr. Robert Collett. [See COLLETT (69).]

205. LÜTKEN, C. W. Letter from, containing remarks as to the possibility of there being more than one species of the genus *Tachyglossus* inhabiting Australia. P. Z. S. 1884, p. 150.

206. LWOFF, W. Beiträge zur Histologie des Haares, der Borste, des Stachels, und der Feder. Bull. Mosc. 1884, p. 141.

An abstract of a histological paper which appeared in full in Russian in 1883.

207. LYDEKKER, R. Indian Tertiary and Post Tertiary *Vertebrata*. Pal. Ind. (10) iii.

Part 1. Additional Siwalik *Perissodactyla* and *Proboscidea*. The new species described are *Aceratherium blanfordi* and *Mastodon falconeri*, and a new subspecies, *Mastodon angustidens palaeindicus*. Part 2. Siwalik and Narbada Bunodont *Suina*. The new species described are *Sus titan*, *Sus falconeri*, *Hyootherium sindiense*, and *Listriodon theobaldi*. Part 3. Rodents and New Ruminants from the Siwaliks, and a synopsis of the *Mammalia*. The new species described are *Rhizomys sivalensis*, *Hystrix sivalensis*, *Oreas latidens*, *Tragulius sivalensis*, *Cervus simplicidens*, *C. triplidens*, and *C. sivalensis*; this is followed by a careful synopsis of all the hitherto identified Siwalik and Narbada Mammals. Part 4. Siwalik Birds. Part 5. *Mastodon* teeth from Perim Isle, containing the description of the teeth of 2 species of *Mastodon* from the Siwaliks of Perim Isle (Gulf of Cambay).

208. —. Catalogue of Vertebrate Fossils from the Siwaliks of India in the Science and Art Museum, Dublin. Tr. R. Dubl. Soc. (2) ii. p. 69.

209. —. Notes on some Fossil *Carnivora* and *Rodentia*. Geol. Mag. (3) i. p. 442.

Description of *Lycan anglicus*, sp. n., from the Caves of Spritsail Tor, Gower.

210. —. Note on the Distribution in Time and Space of the Genera of Siwalik Mammals and Birds. T. c. p. 489.

211. —. Note on a New Species of *Merycopotamus*. T. c. p. 545. [See *Artiodactyla*, *Anthracotheridæ*.]

212. —. Note on the *Anthracotheridæ* of the Isle of Wight. T. c. p. 547.

213. MAJOR, C. J. FORSYTH. Zoogeographische Uebergangsregionen. Kosmos, 1884, i. p. 102.

The author advocates the inclusion of the Palæarctic, Nearctic, and Circumpolar regions into one Holarctic region. And the formation of three intermediate regions between the great primary regions, i.e., the Mediterranean, Austro-oriental, and Nearctic-neotropical intermediate regions.

214. MARSH, O. C. *Dinocera*. United States Geographical Survey, x. Washington: 1884, 4to, pp. 237, pls. lvi.

In this magnificent monograph all the bones of the *Dinocera* are figured, and a restoration is given of *Dinoceras mirabile* and *Tinoceras ingens*. A new classification of the Order *Ungulata* is proposed, dividing

it into 4 suborders—(1) *Hyracoidea*; (2) *Proboscidea*; (3) *Amblydactyla*, containing the *Dinocerata* and the *Coryphodontia*; (4) *Clinodactyla*, containing *Perissodactyla* and *Artiodactyla*. All *Dinocerata* are placed in 3 genera—*Dinoceras*, *Tinoceras*, and *Uintatherium*. Among the species described, *Dinoceras agreste*, *D. cuneum*, *D. reflexum*, *Tinoceras affine*, and *T. latum*, are new.

215. MARTIN, H. B. Objections to the Introduction of Beasts of Prey to Destroy the Rabbit. Tr. N. Z. Inst. 1884, p. 179.

216. *MARTIN, H. N., & MOALE, W. A. Handbook of Vertebrate Dissection. Part III. How to Dissect a Rodent. New York: 1884.

Contains directions for dissecting a Rat (*cf.* Nature, xxx. p. 143).

217. MASSA, C. Notizie intorno alla fauna dei vertebrati di Montegibbio. Atti Soc. Mod. (3) iii. p. 89.

Catalogue of Mammals found in Montegibbio; 20 are enumerated.

218. MAYNARD, C. J. The Mammals of Florida. Q. J. Bost. Zool. Soc. ii. pp. 1, 17, 38, & 49.

List of Mammals, with notes on their habits and occurrences.

219. —. Hibernation of the Jumping Mouse (*Zapus hudsonius*). T. c. p. 15.

220. MEESON, J. Plague of Rats in Nelson and Marlborough. Tr. N. Z. Inst. 1884, p. 199.

The Rat found so abundantly is stated to be *Mus maorium*, Hutton.

221. MERRIAM, C. H. The Vertebrates of the Adirondack Region. 1st instalment. Tr. L. S. N. York, i. pp. 1-106 [*cf.* Zool. Rec. xix. Mamm. p. 11]. 2nd instalment, concluding the *Mammalia*. Op. cit. ii. pp. 1-214.

An account of the Mammals of the Adirondack Mountains, in the western part of the State of New York, with interesting descriptions of their habits, as gathered from personal observation. The first chapter contains a general account of the region, its climate, fauna, and flora; the second chapter describes in detail the 42 species of Mammals occurring in the region.

222. —. Description of a New Genus and Species of the *Sorecidae*. Op. cit. ii. p. 217.

223. —. The Harp Seal a permanent resident in the St. Lawrence. Am. Nat. xviii. pp. 12 & 27.

On the distribution and habits of *Phoca granlandica*.

224. M'FADYEAN, J. The Anatomy of the Horse: a Dissection Guide. Edinburgh: 1884, 8vo, pp. 1-375.

A text-book for veterinary students.

225. MIKLOUHO-MACLAY, N. DE. On a New Species of Kangaroo (*Dorcopsis chalmersii*) from the South-east end of New Guinea. P. Linn Soc. N. S. W. ix. p. 569.

226. —. On a New Sub-Genus of *Peramelidae* (*Brachymelis*). T. c. p. 713.

227. MILNE-EDWARDS, A. Sur l'existence d'un Gorille à la ménagerie du Muséum d'Histoire naturelle. C.R. xcvi. p. 959 (see also *Nature*, xxx. p. 128).

228. —. Sur la disposition des enveloppes fœtales de l'Aye-Aye (*Cheiromys madagascariensis*). *Op. cit.* xcix. p. 265.

Shows that the placentation of the Aye-Aye is non-deciduate and diffuse, thus agreeing closely with other Lemuroids.

229. —. Sur la classification des Taupes de l'ancien continent. *T. c.* p. 1141.

The author considers the 4 genera, *Talpa*, *Mogera*, *Parascaptor*, and *Scaptochirus*, into which the original genus *Talpa* has been divided, only as subgenera; this is in consequence of the discovery by M. l'Abbé A. David, at Akba, on the confines of Syria and Asia Minor, of a new species intermediate between *Scaptochirus* and *Parascaptor*. This the author describes as *Scaptochirus davidianus*.

230. MINOT, C. L. Zur Kenntniss der Samenblasen beim Meerschweinchen. *Arch. mikr. Anat.* xxiv. p. 211.

A short histological account of the vesiculæ seminales of the Guinea Pig.

231. MIVART, ST. G. Hands and Feet. *Zool.* (3) viii. p. 281.

232. MOJSISOVICS, A. VON. Nachträge zur Anatomie von *Loxodon africanus*, Falc. Graz: 1884, 8vo, pp. 1-24, pls. i. & ii.

Further remarks on the anatomy of the African Elephant; a supplement to the paper published in *Arch. f. Nat.* 1879.

233. —. Ueber ein "seltenes" Geweih. *MT. Ver. Steiern.* 1884, p. cii.

234. —. Zur Zahnformel von *Halichærus grypus*, Fabr. *Zool. Anz.* vii. p. 96.

A correction of the dental formula of *Halichærus*.

235. *MULLER, F. Lehrbuch der Anatomie der Haussäugethiere mit besonderer Berücksichtigung des Pferdes und mit physiologischen Bemerkungen. 3 Aufl. Wien: 1885, 8vo. (*Cf.* *Zool. Anz.* viii. p. 233.)

236. MULLER, H. C. Oplysninger om Grindefangsten paa Faerøerne. *Vidd. Medd.* 1883, p. 17.

Notes on the capture of the "Ca'ing Whale," *Delphinus globiceps*, near the Faroe Isles; there is a table showing the number of Whales captured yearly since 1584.

237. MUNK, H. Ueber die centralen Organe für das Sehen und das Hören bei den Wirbelthieren. *SB. Ak. Berl.* 1884, p. 549.

A physiological-psychological investigation of the power of sight and hearing in Mammals.

238. MURRAY, J. A. The Vertebrate Zoology of Sind. London: 1884, 8vo [Mammals, pp. 1-66].

Contains descriptions of all the Mammals found in Sind, numbering altogether 73 species. The Mammals are illustrated by 5 pls.

239. [MURRAY, J. A.] A Contribution to the Knowledge of the Marine Fauna of Kurrachee. Ann. N. H. (5) xiii. p. 348.
[See *Cetacea* ; *Delphinidae*.]
240. —. Additions to the Present Knowledge of the Vertebrate Zoology of Persia. *Op. cit.* xiv. p. 97.
Mentions certain species of *Rhinolophus*, *Ursus*, *Delphinus*, *Dipus*, and *Lagomys*, as occurring in Persia, and gives a description of a new species (*Dipus blanfordi*).
241. NATHAN, J. Zur Mechanik des Wiederkauens. Kosmos, 1884, ii. p. 383.
242. NEHRING, A. Fossile Pferde aus Deutsche Diluvial-Ablagerungen u. ihre Beziehungen zu den lebenden Pferden. Berlin : 1884.
A work on the ancestry of the modern Horse. The author concludes that our carthorses were divided from the Diluvial Horse of middle Europe ; while the smaller races of Horses come chiefly from Asia.
243. —. Ueber diluviale und prehistorische Pferde Europa's. SB. nat. Fr. 1884, p. 1.
244. —. Ueber den Schädel eines zweigartigen Schweines (*Sus scrofa nanus*) aus dem Torfmoor von Tribsees in Neu-Vorpommern. T. c. p. 7.
245. —. Ueber *Halarachne halichæri*, Allman, sowie über einige *Hali-chærus*-Schädel. T. c. p. 57.
246. —. Ueber eine Schädel von *Canis jubatus*, Desm. T. c. p. 107.
247. —. Ueber die Cerviden der Gegend von Piracicaba in Brasilien. T. c. p. 115.
Contains descriptions of *Cervus paludosus*, *C. campestris*, *C. rufus*, *C. nemorivagus*, and *C. rufinus*.
248. —. Ueber eine grosse wolfsähnliche Hunde-Rasse der Vorzeit (*Canis familiaris decumanus*, Nehring), und über ihre Abstammung. T. c. p. 153.
249. —. Ueber eine kleine Spiesshirsch-Species (*Coassus sartorii*) aus der Provinz Vera Cruz in Mexico. T. c. p. 199.
250. —. Texas und seine Tierwelt. Zool. Gart. 1884, pp. 197 & 225.
A popular account of animals and plants observed in Texas.
251. NELSON, E. W. A New Geographical Race of the Mountain Sheep (*Ovis montana dalli*, var. n.) from Alaska. P. U. S. Nat. Mus. vii. p. 12.
This variety seems to be spread all over the mainland of Alaska.
252. NEUMAYR, M. *Triglyphus* und *Tritylodon*. JB. Mineral. 1884, i. p. 279.
The writer compares the teeth of *Tritylodon*, the South African Triassic Mammal described by Owen, with those described by Fraas in his work "Von der Sündfluth," which were found in a bone bed near Strasburg, and named *Triglyphus*.

253. NEWTON, E. T. Note on *Coryphodon* Remains from the Woolwich Beds of the Park Hill Section, Croydon. P. Geol. Ass. viii. p. 250. [See *Coryphodontidae*.]
254. —. On the Occurrence of Antelope Remains in Newer Pliocene Beds in Britain, with the description of a new species, *Gazella anglica*. J. G. Soc. xl. p. 280.
- The paper concludes with a useful list of Fossil *Antilopidae*.
255. —. Revised List of *Vertebrata* from the Forest-Bed Series. Tr. Norw. Soc. iii. p. 654.
- About 55 species of Mammals are enumerated.
256. NICOLS, A. Natural History Sketches among the *Carnivora*, Wild and Domesticated. London: 1884, 8vo.
- Popular natural history sketches.
257. NIKOLSKY, A. (Report on a zoological collection from the Altai Mountains.) [Russian.] Mem. St. Petersburg. Soc. Nat. xiv.
- 50 Mammals observed; 1 sp. n., *Tulpa altaica* (cf. Nature, xxx. p. 928.)
258. NIPHER, F. E. Evolution of the American Trotting Horse. Am. J. Sci. (3) xxvii. p. 44.
- Note on a paper published the preceding year.
259. NOACK, T. Zur Fauna des Somalilandes. Zool. Gart. 1884, p. 375.
- Account of Mammals observed by Carl Hagenbeck's collector in Somali-land.
260. OWEN, R. Description of Teeth of a Large Extinct (Marsupial?) genus *Sceparnodon*, Ramsay. Phil. Tr. clxxxv. p. 245.
261. —. Evidence of a Large Extinct Monotreme (*Echidna ramsayi*, Owen) from the Wellington Breccia Cave, New South Wales. T. c. p. 273.
- Description of humerus found in the above-mentioned cave, evidently the humerus of a species of *Echidna*.
262. —. Description of an Impregnated Uterus and of the Uterine Ova of *Echidna hystrix*. Ann. N. H. (5) xiv. p. 373.
- Contains some researches on embryos of *Echidna* made by Sir R. Owen himself; also a letter from Mr. Caldwell to the "Sydney Herald" announcing the discovery of the eggs of both *Ornithorhynchus* and *Echidna*.
263. —. On the Skull and Dentition of a Triassic Mammal (*Tritylodon longævus*, Owen) from South Africa. J. G. Soc. xl. p. 146.
- Appears to be allied to *Microlestes* and *Stereognathus*, but its true systematic position is still uncertain.
264. PARKER, T. J. A Course of Instruction in Zootomy (*Vertebrata*). London: 1884, 8vo.
- [Rabbit, pp. 262-379.]
265. —. Notes on the Skeleton and Baleen of a Fin-Whale (*Balaenoptera musculus*?) recently acquired by the Otago University Museum. Tr. N. Z. Inst. 1884, p. 3.

266. PARKER, W. K. On Mammalian Descent. London: 1884, 8vo, 229 pp.

This is a popular reproduction, in the form of a series of lectures, of Prof. Parker's well-known investigations into the phylogeny of the *Mammalia*. The chapters on *Edentata* and *Insectivora* (pp. 90-187) are those that will be found most useful to the student.

267. —. On the Structure and Development of the Skull in the *Mammalia*. Part II. *Edentata*. P. R. Soc. xxxvii. p. 78.

Mr. Parker comes to the conclusion that the Edentates are more nearly allied to the Monotremes than to the Marsupials; that the Neotropical Edentates must be separated from the old-world forms; and that *Orycteropus* has resemblances to *Rhynchocyon*, and is probably the only Edentate that has sprung from a Metatherian stock.

268. PAUL, H. Ueber Hautanpassung der Säugethiere. Jena: 1884, 8vo. A work on the dermis and epidermis of Mammals.

269. *PAUNTSCHIEFF, G. Untersuchungen über den Magen der Wiederkäuer. Leipzig: 1884. (Cf. Zool. Anz. viii. p. 251.)

270. PHILIP, R. W. Beiträge zur Lehre über die Entwicklung der Trachea. MT. Embr. Inst. Wien, ii. p. 177.

271. PICAGLIA, L. Vertebrati del Modenese. Atti Soc. Ital. (3) Rendic. i. p. 133.

On the occurrence of certain Mammals in the neighbourhood of Modena, among them *Mustela martes*, *Synotus barbastellus*, and *Arvicola subterraneus*.

272. *PLANTEAU, H. Developpement de la colonne vertébrale. Paris: 1883, 4to, pp. 116, 1 pl. (Cf. Zool. Anz. vii. p. 136.)

273. PLESKE, T. Uebersicht der Säugethiere u. Vögel der Kola-Halbinsel. I. Säugethiere. Beitr. Russ. Reiches. (2) vii.

A list of Mammals collected in the Kola Peninsula in North-West Russia.

274. POUCHET, G., & CHABRY, L. Contribution à l'Odontologie des Mammifères. J. de l'Anat. Phys. 1884, p. 149.

Contains an account of the development of teeth in the Sheep, Calf, Pig, Horse, Donkey, Rabbit, Rat, Squirrel, *Orycteropus*, Sloth, Kangaroo, Dolphin, *Globiceps*, and *Balanoptera*.

275. POUCHET, —, & BEAUREGARD, —. Sur la boîte à Spermaceti. C.R. xcix. p. 248.

On the structure and mode of formation of spermaceti in the Cachalot.

276. POULTON, E. B. The Structures connected with the Ovarian Ovum of *Marsupialia* and *Monotremata*. Q. J. Micr. Sci. xxiv. p. 118.

Mr. Poulton describes the ovarian ovum of a species of *Phalangista* and of *Ornithorhynchus*, and shows that while that of *Phalangista* agrees fairly well with the higher Mammals, the ovarian ovum of *Ornithorhynchus* differs from all other Mammals in possessing only a single layer of follicular epithelium round the ovum, in place of the many-layered granulo-losa of all higher Mammals.

277. POWERSCOURT, MERVYN [VISCOUNT]. On the Acclimatization of the Japanese Deer at Powerscourt. P. Z. S. 1884, p. 207.

278. POZZI, I. C. Cenni sopra un lupo. Atti Soc. Ital. (3) i. p. 41.

279. PRSCHEWALSKI, N. VON. Reisen in Thibet und am oberen Lauf des Gelben Flusses. Aus dem Russischen frei in das Deutsche übertragen und mit Anmerkungen versehen von Stein Nordheim. Jena: 1884, 8vo, 281 pp.

A German translation of the Russian work published last year. Interesting accounts of the fauna of Central Asia, with descriptions of the Mammals inhabiting Thibet.

280. *QUÉNU, E. Développement du cœur et du péricarde. Paris: 1883, 4to. (Cf. Zool. Anz. vii. p. 136.)

281. RAUBER, A. Ueber die Entwicklung der Gewebe des Säugethierkörpers und die histologischen Systeme. SB. Ges. Leipzig, 1883, p. 13.

An essay on the higher aspects of embryology.

282. READING, J. H. The Habits of the Gorilla. Am. Nat. xviii. p. 1277.

283. REICHART, P. Schimpanse am Tanganika. Arch. f. Nat. 1884, p. 120.

A letter from Herr Reichart describing the habits and nests of a chimpanzee which appears to be fairly abundant on the western shores of Lake Tanganyika.

284. REID, C. On Recent Additions to the Fauna and Flora of the Cromer Forest Bed. Tr. Norw. Soc. iii. p. 631.

Occurrence of *Cervus tetraceros*, *Ovibos moschatus*, and *Hyena crocuta* var. *spelæa*, in the Cromer forest bed.

285. REIN, J. J. Japan: Travels and Researches, translated from the German. London: 1884, 8vo, pp. 534.

Chapter vii. contains an account of the Japanese Mammals.

286. RETTERER, E. Contribution au développement du Squelette des extrémités chez les Mammifères. J. de l'Anat. Phys. 1884, p. 467.

This paper contains a long account, with measurements, of the development of the fore and hind foot in several Mammals, *i.e.*, human foetus, Gibbon, Dog, Cat, Horse, et al. The first part treats of the development of the cartilaginous skeleton, the second of the ossification of the cartilaginous skeleton.

287. RETZIUS, G. Das Gehörorgan der Wirbelthiere. II. Das Gehörorgan der Reptilien, der Vögel, und der Säugethiere. Stockholm: 1884, folio. [Mammals, pp. 201-358, pls. xxi.-xxxix.]

The second part of this magnificent work contains descriptions of the ear of the Rabbit, Ox, Pig, Cat, and of Man.

288. *REYNIER, P. Du développement de la portion sus-diaphragmatique du tube digestive. Paris: 1883, 8vo, 112 pp. (Cf. Zool. Anz. vii. p. 136.)

289. *ROHON, J. V. Zur Anatomie der Hirnwindungen bei den Primaten. München: 1884, 4to. (*Cf. Zool. Anz.* viii. p. 251.)
290. RÖMER, F. The Bone Caves of Ojcow, in Poland; translated by J. E. Lee. London: 1884, 4to. [*Cf. Zool. Rec.* xx. *Mamm.* p. 21.]
291. ROSENBERG, E. Beobachtungen an den Wirbelsäule eines Edentaten. SB. Ges. Dorp. vi. p. 255.
292. *RÜCKERT, —. Vorläufige Mittheilungen zur Entwicklung der Visceralbogen bei Säugethiere. *Arztl. Intelligenzbl.* München: 1884. (*Cf. Zool. Anz.* viii. p. 249.)

293. RÜTIMEYER, L. Studien zu der Geschichte der Hirschfamilie. II. Gebiss. *Verh. Ges. Basel*, vii. p. 399.

The first part contains descriptions of the teeth of the *Tragulina* and the *Cervina* now existing; in the second part are described the teeth of fossil Selenodonts; there is a supplement, with accounts of the distribution of the fossil forms.

294. SABATIER, A. Contribution a l'étude des Globules Polaires. *Rev. Montp.* (3) iii. p. 362. [For abstract, *cf. J. R. Micr. Soc.* (2) iv. p. 535.]

295. SAGEMEHL, A. Aus welchem Keimblatt entwickeln sich die Spinalnerven der Wirbelthiere. SB. Ges. Dorp. vi. p. 13.

- 295A. ST. JOHN, C. A Tour in Sutherlandshire, with the Extracts from the Fieldbooks of a Sportsman and Naturalist. 2nd Edition, with an Appendix on the Fauna of Sutherland, by J. A. Harvie-Brown & T. E. Buckley. Edinburgh: 1884, 8vo, i. 296 pp.; ii. 374 pp.

A reprint of the first edition, published in 1849, with the addition of recollections of Mr. St. John, and of an appendix containing a description of the physiography and fauna of Sutherlandshire. 33 Mammals are mentioned.

296. SANDERSON, G. P. The Asiatic Elephant in Freedom and Captivity. *J. Soc. Arts*, xxxii. p. 410.

An exceedingly interesting paper on the habits and intelligence of the Elephant, by the Government Superintendent of the Elephant-catching operations in India.

297. SANGER, E. B. The Mammalian Fauna of the Australian Desert. *Am. Nat.* xviii. p. 9.

298. SANDEMANN, E. Zur Anatomie der Thränendrüse. *Zool. Anz.* vii. p. 569.

The author traces the lachrymal glands and their modifications, from their first appearance in Urodeles, to the highest Mammals.

299. SCHLECTER, J. Ueber die Ursachen, welche das Geschlecht bestimmen. *Rev. Tierheilkunde*, No. 7. Wien: 1884. [Abstracted in *J. R. Micr. Soc.* (2) v. p. 215.]

Investigations as to the causes of sex; account of experiments in the reproduction of horses.

300. SCHLOSSER, M. Die Nager des Europäischen Tertiärs. Palæontogr. xxxi. pp. 19-143, pls. v.-xii.

The first part of this paper contains a systematic account of the European Tertiary Rodents, with descriptions of 3 new genera and 24 new species. This is followed by a table of distribution. The second part contains a general account of the fossil forms as compared with the recent Rodents and lower Carnivores; the classification used is Brandt's, as modified by Cope, *i.e.*,

1. *Pliodonta*, *Leporidae*, and *Lagomyidae*.
2. *Miodonta* (a) *Hystricomorpha*.
- (b) *Sciuromorpha*.
- (c) *Myomorpha*.

Finally, there is a list of the fossil Rodents of North America.

301. —. Nachträge u. Berichtigungen zu "Die Nager des Europäischen Tertiärs." Zool. Anz. vii. p. 639.

Additions and corrections to the above paper (No. 300).

302. SCHMIDT, M. Der Ameisenfresser (*Myrmecophaga jubata*). Kosmos, 1884, ii. p. 191.

Notes on the habits of the Great Anteater.

303. —. Ueber die Fortpflanzung des indischen Elefanten in Gefangenschaft. T. c. p. 365.

Remarks on the breeding of Elephants in captivity.

304. —. Die Wachstumsverhältnisse des indischen Elefanten. Zool. Gart. 1884, p. 4.

305. SCHMIDT, O. Die Säugethiere in ihren Verhältniss zur Vorwelt. Leipzig: 1884, 8vo, pp. 1-280.

A popular account of Mammalian Palæontology.

306. SLATER, P. L. On the Lesser Koodoo, *Strepsiceros imberbis*, of Blyth. P. Z. S. 1884, p. 45, pl. iv.

- 306A. —. Report on Additions to the Society's Menagerie. *Cercopithecus martini*; t. c. p. 176, pl. xiv. *Sphingurus spinosus*; t. c. p. 389, pl. xxxiii.

307. —. On some Mammals from Somali-land. T. c. p. 538, pls. xlix. & l.

Notes on a collection of flat skins, obtained by Mr. C. Hagenbeck, of Hamburg, from Somali-land; with a description of a new subspecies, *Equus asinus somalicus*.

308. SCOTT, W. B. A New Marsupial from the Miocene of Colorado. Am. J. Sci. (3) xxvii. p. 442.

Didelphys pygmaea, from the Miocene of Chalk Bluffs, Colorado.

309. SELENKA, E. Studien über Entwicklungsgeschichte der Tiere. Drittes Heft. Die Blätterumkehrung im Ei der Nagethiere. Wiesbaden: 1884, 4to, pp. 67-99, pls. xi.-xvi.

An explanation of the inversion of the layers in the Guinea Pig. The inversion is caused by the formation of a secondary blastodermic vesicle, in which the embryo is formed. The author shows that there is a regular

transition from the simple formation of the layers in *Lepus* to complete inversion in the Guinea Pig, through such forms as *Arvicola arvalis* and *Mus musculus*.

310. [SELENKA, E.] Ueber die Inversion der Keimblätter im Ei des Meerschweinchens, der Ratten und Mäuse. SB. nat. Fr. 1884, p. 51.

311. SIGEL, W. L. Das Nilpferd des Zoologischen Gartens in Hamburg. Zool. Gart. 1884, p. 33.

Gives measurements and the dental formulæ at the different stages of growth of a Hippopotamus.

312. *SLEVOGT, F. Ueber die im Blute der Säugethiere vorkommen Körnchenbildungen. Dorpat: 1883. (Cf. Zool. Anz. vii. p. 137.)

313. SMITH, F. Congenital Malformation of the Trachea of a Horse. J. Anat. Phys. xix. p. 24.

314. SMITH, H. H. The Naturalist Brazilian Expedition. Am. Nat. xviii. pp. 464 & 578.

Contains an account of Mammals observed.

315. SOBOLEFF, I. Die Verletzung des Amnions während der Bebrütung. MT. Embr. Inst. Wien, ii. p. 169.

Physiological experiments on the ripening embryo.

316. *SOKOLOFF, N. A. On the teeth of *Mastodon arvernensis* and *Hipparion gracile*, from the Crimea (Russian). Mem. St. Peters. Soc. Naturalists, xiv. (Nature, xxx. p. 328.)

317. SOUTHWELL, T. Notes on the Seal and Whale Fishery in 1882 and 1883. Zool. (3) viii. pp. 121 & 295.

318. —. *Mammalia* of Norfolk. Tr. Norw. Soc. iii. p. 657.

This is a reprint, with additions, to a previous list. There have been added 7 species: *Vesperugo discolor*, *Sorex pigmaeus*, *Halicherus gryphus*, *Balena biscayensis*, *Globicephalus melas*, *Muscardinus avellanarius*, and *Arvicola glareolus*; the total number of species is, therefore, 41.

319. SPEE, F. VON. Ueber directe Betheiligung des Ectoderms an der Bildung der Urnierenanlage der Meerschweinchens. Arch. Anat. Phys. (Anat.) 1884, p. 89.

The author attempts to prove that the nephric blastema is derived, not from the mesoblast, as it is generally said to be, but is split off from the epiblast; so that the epithelium lining the adult kidney is epiblastic, and does not form the solitary exception to the rule that all epithelia are either epiblastic or hypoblastic in origin.

320. SPENCER, W. B. The Eggs of Monotremes. Nature, xxxi. p. 132.

A review of all that has been written on the subject of the eggs of Monotremes.

321. STEJNEGER, J. Contributions to the History of the Commander Islands. No. II. Investigations Relating to the Date of the Extinction of Steller's Sea-Cow. P. U. S. Nat. Mus. vii. p. 181.

A controversial paper, showing that the evidence on which Prof. Nordenskjöld bases his statements that *Rhytina* survived even up to the year 1854 is incorrect.

322. STERNDALÉ, R. A. Natural History of the *Mammalia* of India and Ceylon. Calcutta : 1884, 8vo, pp. 1-540.

A popular account of the Indian *Mammalia*, with native names, habitats, and descriptions of each species.

323. STRAHL, —. Ueber Entwicklungsvorgänge am Kopf und Schwanz von Reptilien- und Säugethier-embryonen. Zool. Anz. vii. p. 376.

A short account of some observations in the primitive streak in Dog embryos.

324. STUDER, T. Nachtrag zu dem Aufsätze über die Thierwelt in den Pfahlbauten des Bielersee's [Lac de Bièvre]. MT. Ges. Bern, 1884, i. p. 3.

Description of the skull of a Dog and of a human skull found in the lake dwellings at the Bielersee.

325. SUSSDORF, —. Ueber den histologischen Bau der Hertzklappen bei Pferd und Rind. Tag. Deut. Nat. Ver. 1883, p. 133.

326. SUTTON, J. B. On the Diseases of the Carnivorous Mammals in the Society's Gardens. P. Z. S. 1884, p. 177, pls. liii. & liv.

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- 358C. —. Notes on the Fauna of the Gulf of Carpentaria. *T. c.* p. 154.
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III.—SUMMARY OF WORK ON THE GENERAL SUBJECT.

1. GENERAL ZOOLOGY.

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- KINGSLEY (165). An American work on popular Natural History, chiefly on the lines of Cassell's Natural History.
- LENZ (198). 6th edition of this popular Natural History book.
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2. COMPARATIVE ANATOMY.

(a.) *Text Books.*

- WIEDERSHEIM (367). A shorter and more elementary edition of his well-known text-book.
- BRUHL (48). Three parts, containing ingenious diagrams of the connections of bones and muscles in man and other Mammals.
- T. J. PARKER (264). Text-book of Vertebrate dissection, with a full account of the anatomy of the Rabbit.
- KRAUSE (175). A new edition of his work on the anatomy of the Rabbit.

(b.) *Epidermic Structures.*

- BOAS (37) and GEGENBAUR (126). On the Morphology of Vertebrate Nails.
- COPE (72). On the trituberculate type of tooth as the primitive one.
- BLANDY (32). On the comparative anatomy of teeth.

(c.) *Osteology.*

- FLOWER (116). Catalogue of the osteological specimens in the Museum of the Royal College of Surgeons.
- W. K. PARKER (266). On Mammalian phylogeny, as deduced from the study of the development of skulls.
- W. K. PARKER (267). On the development of the skull in the *Edentata*.
- ALBRECHT (5). On the cerebellar fossa of the Mammalian skull.
- ALBRECHT (3). On a new bone, the basiotic, discovered between the basioccipital and the basisphenoid.

ALBRECHT (4). On the morphological elements of the Mammalian sternum.

LAVOCAT (187). On the morphology of the Mammalian scapula and clavicle.

LECHE (44). On the Mammalian pelvis and femur.

LECHE (194). On the morphology of the os acetabuli.

ALBRECHT (7). On the homologies of the Mammalian carpus and tarsus, with a table.

BAUR (18). On the carpus of Artiodactyles.

LEBOUCQ (190). On the morphology of the carpus.

BAUR (19). On the os centrale carpi of Mammals.

BAUR (20). On the morphology of the tarsus.

BARDELEBEN (15) and (14). On the os intermedium tarsi in Mammals.

WEBER (362). On the coalescence of the navicular and calcaneum.

(d.) *Nervous Structures and Sense Organs.*

RETZIUS (287). Second part of his work on auditory organs.

TUTTLE (349). On the relation of the external auditory meatus to the first visceral cleft.

VITI (359). On the morphology of the depressor nerve.

BRUCHER (46). On the distribution of the taste papillæ of the tongue.

(e.) *General Anatomy of the Soft Parts.*

LUDWIG VON BAYERN (21). On the anatomy of the tongue.

GEGENBAUR (124). On the anatomy of the sublingua of Mammals.

SANDEMAN (298). On the anatomy of the lachrymal gland.

KOERNER (169). Supplement to a former work on the larynx.

EXNER (105). On the innervation of the larynx.

ALBRECHT (8). On the Eustachian tube.

DOBSON (96). Occurrence of Peyer's Patches in the cæcum and colon of certain Mammals; see also BEDDARD (23).

3. EMBRYOLOGY.

(a.) *Text Book.*

KÖLLIKER (170). A second and enlarged edition of his text-book of embryology.

(b.) *General Works.*

SABATIER (294). On polar bodies.

SCHLECTER (299) and DÜSING (100). On the theory of sex.

RAUBER (281). On the development of the histological tissues.

(c.) *Phenomena of Early Stages.*

SELENKA (309) and (310). On the inversion of the layers in certain Rodents.

- BONNET (39). On the early stages of the development of the Sheep.
STRAHL (323). On the primitive streak of the Dog.

(d.) *Fœtal Envelopes.*

E. VAN BENEDEN & JULIN (26). Fœtal membranes of Rabbits and Bats.

CURIE (84) and (85). On a direct placental communication between parent and fœtus.

SOBOLEFF (315). Physiological experiments on the amnion of embryos.

(e.) *Development of the Skeleton.*

LIEBERKÜHN (199). The notochord in the Guinea Pig.

REITTERER (286). The limb skeleton.

BRAUN (42). The tail-end of the body.

(f.) *Development of Nerves and Sense Organs.*

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BARNES (16). Posterior fissure of the spinal cord and reduction of the central canal.

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4. HISTOLOGY.

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ELLENBERGER (103). The first part of a new text-book of histology.

(b.) *Histology of Nerves.*

VIGNAL (353), (354), and (356). On the structure and development of the brain substance of Mammals.

- VIGNAL (355). On the development of nerve tubes.
 VINCENTI (357). On the origin of several cerebral nerves.
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 HOGGAN (153). On some new forms of nerve terminations.

(c.) *Histology of the Epidermis and its Derivatives.*

- FLEMMING (113). On the regeneration of the epidermis.
 PAUL (268). Histology of the Mammalian skin.
 LWOFF (206). On hairs, bristles, and feathers.
 WALDEYER (361). Atlas of human and other hair for technical students.
 HENLE (142). On the structure and development of nails and hoofs.

(d.) *Histology of the Generative Organs.*

- MINOT (230). On vesiculæ seminales.
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(e.) *Histology of the Alimentary Canal, &c.*

- TRINKLER (341). On the epithelial wall of the stomach.
 PHILIP (270). Structure and development of the trachea.

5. PALÆONTOLOGY.

- HOERNES (151). A concise text-book of palæontology.
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 LYDEKKER (207). Third volume of the Indian Tertiary and Post-Tertiary *Vertebrata* from the Siwaliks.
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 COPE (79). On the phylogeny of the Mammals as deduced from the extinct forms.
 MARSH (214). Monograph of the *Dinocera*.

6. GEOGRAPHICAL DISTRIBUTION AND FAUNAS.

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6. MISCELLANEOUS GENERAL WORKS.

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(b.) *Comparative Psychology.*

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(d.) *Various Papers.*

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DOBSON (97). On the comparative value of bones and muscles in classification.

DOBSON (94). On the unimportance of the presence of the hallux as a guide in classification.

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Atophyrax bendirii, g. & sp. nn., MERRIAM (222), from Oregon, U.S.A.
Amphisorex primarius, sp. n., FILHOL (108), fossil from Lamandine phosphate beds.

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Camphotherium elegans, sp. n., FILHOL (107), fossil from the Quercy phosphate beds.

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Miniopterus schreibersi var. *blepotis*, var. n., LECHE (192), from South Australia.

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Nyctinomus petersi, *N. albidus*, spp. nn., LECHE (192), from South Australia. *N. plicatus*: LECHE (192), its occurrence in South Australia.

Taphozous affinis var. *insignis*, var. n., LECHE (192), from South Australia

6. RODENTIA.

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SCIURIDÆ.

Sciurus vulgaris: LOEWIS (200) on the distribution of its black variety. *S. cayluxi*, sp. n., FILHOL (110), fossil from Caylux phosphate beds. *S. dubius*, sp. n., SCHLOSSER (300), fossil from Quercy Eocene beds.

Pseudosciurus minor, sp. n., SCHLOSSER (300), fossil from Quercy Eocene.

Spermophilopsis leptodactylus. BLASIUS (35) forms a new genus, *Spermophilopsis*, for the old species *Spermophilus leptodactylus*.

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Castor fiber. COLLETT (68) on its recent and historic localities in Norway.

GENERA INCERTÆ SEDIS.

Sciuroides quercyi, *S. intermedius*, spp. nn., SCHLOSSER. (300), fossils from Quercy Eocene.

Sciurodon cadurcense, *Sciuromys cayluxi*, gg. & spp. nn., SCHLOSSER (300), fossils from Quercy Eocene.

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MYOXIDÆ.

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Arvicola. WOLDRICH (371), description of fossil forms from Moravia.

Hesperomys: O. THOMAS (336) recognizes 9 subgenera in this large genus [vide *suprà*.] *H. laticeps* var. *nitidus*, var. n., *H. (Calomys) bimaculatus* var. *lepidus*, var. n., O. THOMAS (336), from Central Peru.

Thomasomys. COUES (83) proposes this name as a new subgenus for *Hesperomys cinereus* and *H. taczanowskii*.

Rheithrodon pictus, sp. n., O. THOMAS (336), from Central Peru.

Ellobius tancrei, sp. n., BLASIUS (34), from the Altai Mountains.

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Rhizomys sivalensis, sp. n., LYDEKKER (207), fossil from the Siwaliks.

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Zapus hudsonius. MAYNARD (219) on its hibernation.

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Dipus blanfordi, sp. n., MURRAY (240), from Persia.

GENUS INCERTÆ SEDIS.

Eomys zitteli, sp. n., SCHLOSSER (300), fossil from Quercy Eocene.

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Capromys melanurus. DOBSON (93) on the anatomy, with a description of the species.

Loncheres armatus. TRUE (347), occurrence of this species in Martinique.

Theridomys rotundidens, from Quercy Eocene, and *T. parvulus*, from Lower Miocene, spp. nn., SCHLOSSER (300).

Protechimys gracilis, *P. major*, spp. nn., SCHLOSSER (300), from Quercy Eocene.

HYSTRICIDÆ.

Hystrix sivalensis, sp. n., LYDEKKER (207), from Siwaliks. *H. suivica*, sp. n., SCHLOSSER (300), fossil from Upper Miocene.

Sphingurus spinosus. SCLATER (306A), remarks, with plate.

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Cavia porcellus. MINOT (230), histology of the vesiculæ seminales; SPEE (319), on the formation of the mesonephros from the ectoderm; SELENKA (309) and (310), on the inversion of the embryonic layers.

Hydrocharus capybara. FLOWER (118) on the dentition of a young specimen.

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Nesokerodon minor, *N. quercyi*, g. & sp. nn., SCHLOSSER (300), fossil from Quercy Eocene.

Trechomys insignis, *T. intermedius*, *T. pusillus*, spp. nn., SCHLOSSER (300), fossil from Quercy Eocene.

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DURY (99). List of N. American *Leporidae*, recent and extinct.

HILGENDORF (150). On the teeth of the *Leporidae*.

Lepus cuniculus. KRAUSE (175), text-book of the anatomy of the Rabbit; T. J. PARKER (264), directions for the dissection; VAN BENE-
DEN (26), on the fetal envelopes of the Rabbit.

7. UNGULATA.

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indicus. SANDERSON (296), on its habits in freedom and

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Elephas primigenius. GREWINGK (128), on its occurrence in the Baltic provinces of Russia; CHOUQUET (59), on its occurrence in the alluvial deposits at Chelles; D'ARCY (86), on its occurrence in the forest bed of Cromer.

Mastodon serridens, sp. n., from Texas, *M. euhypodon*, sp. n., fossil from Kansas, COPE (76). *M. angustidens* var. *palaeindicus*, var. n., LYDEKKER (207), fossil from the Siwaliks. *M. falconeri*, sp. n., LYDEKKER (207), fossil from the Siwaliks. *M. pandionis*, *M. perimensis*, LYDEKKER (207), descriptions of their teeth from the Siwaliks of Perim Isle, Gulf of Cambay. *M. arvernensis*, SOKOLOFF (316), occurrence in the Crimea.

DINOTHERIIDÆ.

Dinotherium sp. BIEBER (30), its occurrence in the same beds as *Mastodon*, at Franzensbad.

DINOCERATA.

MARSH (214). General description of the group.

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PALEOTHERIIDÆ.

Hipparion gracile. SOKOLOFF (316), its occurrence in the Crimea.

EQUIDÆ.

Equus caballus. FLESCH (115), on the hypophysis of the brain of the horse; SUSSDORF (325), on the histology of the valves of the heart; M'FADYEAN (224), on the anatomy of the horse, a text-book; LEGGE & LANZILLOTT-BUONSANTI (195), on the convolutions of the horse's brain; BOAS (38), on polydactylous horses; IHERING (156), on polydactylous horses; LAULANIE (189), spermatogenesis in horses; SMITH (313), diseases of the horse's trachea; NIPHER (258), evolution of the American trotter; NEHRING (242) (243), on fossil horses, and their relation to living varieties and breeds; WILCKENS (369), on the ancestry of the horse; LANDOIS (181), on a fossil horse's skull.

Equus fossilis. GREWINGK (128), its occurrence in the Baltic provinces of Russia.

Equus asinus var. *somaticus*, var. n., SCLATER (307), from Somali-land; var. *atlanticus*, var. n., P. THOMAS (338), fossil from Algeria.

RHINOCEROTIIDÆ.

Rhinoceros (Aceratherium) minutus. TOULA (340), its occurrence the bone-caves of Turnau, in Styria; VACEK (350), on its lower

Aceratherium blanfordi, sp. n., LYDEKKER (207), fossil from the Siwaliks.

Rhinoceros sp. JENTINK (159), on a species from Borneo.

CONDYLARTHRA.

COPE (78). A general account of the Order.

PERIPTYCHIDÆ.

Anisonchus agapetillus, *A. copiator*, spp. nn., COPE (71), fossil from Puerco Beds.

AMBLYPODA.

COPE (80). A general account of the Order.

CORYPHODONTIDÆ.

Coryphodon croydonensis, sp. n., NEWTON (253), fossil from Woolwich beds, near Croydon.

ARTIODACTYLA.

DEPERET (92) : descriptions of *Bovidae*, *Cervidae*, and *Antelopida*, from Auvergne, found in Pliocene and Quaternary times.

COPE (79) derives the Artiodactyle phylum from some such Tritubercular Bunodont as *Pantolestes*.

PAUNTSCHIEFF (269) : on the stomach of Ruminants. RUTIMEYER (293) : on the teeth of *Artiodactyla*, both recent and extinct. CATON (56) : on the natural history of American Deer and Antelopes.

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Bos primigenius : GREWINGK (128), on its occurrence in the Baltic provinces of Russia. *B. mauritanicus*, sp. n., P. THOMAS (338), fossil from Algeria. *B. grunniens* : KUHN (179), birth of a hybrid between *B. grunniens*, the Yak, and *B. indicus*, a Sanga Zebu. *B. frontalis* : KUHN (178), fertility of a bastard Gayal. *B. indicus* : BARTLETT (17), hybrids bred from it.

Ovis aries : BONNET (39), on the early stages of development. *O. poli* : BLANFORD (33), remarks on a series of heads. *O. montana dalli*, var. n., NELSON (251), from Alaska. *O. ophion* : BIDDULPH (29), notes on the natural history.

Oreas latidens, sp. n., LYDEKKER (207), from the Siwaliks.

Alcelaphus cokii, sp. n., GÜNTHER (134), E. Africa.

Strepsiceros imberbis : SCLATER (306), notes, with a figure.

Gazella anglica, sp. n., NEWTON (254), from Norwich crag. *G. thomsoni*, sp. n., GÜNTHER (134), from E. Africa.

Tetracerus quadricornis : WELDON (363), on its placentation.

Antelope tournoueri, *A. (Palæoreas) gaudryi*, *A. (Gazella) atlantica*, sp. n., P. THOMAS (338), fossil from Algeria.

CERVIDÆ.

Cervus elaphus: JEFFERIES (158), on the natural history of the Exmoor Red Deer. *C. sika*: VISCOUNT POWERSCOURT (277), account of their acclimatization at Powerscourt. HEUDE (145) proposes to form a new genus, *Sika*, for the various varieties of *Cervus sika* of Schlegel; of this new genus *Sika* he describes no less than 37 species, viz.: *S. jouetianus*, *S. cycloceros*, *S. gracilis*, *S. grilloanus*, *S. pourrelianus*, *S. macrodontus*, *S. frinianus*, *S. oxycephalus*, *S. lacrymosus*, *S. yuanus*, *S. andreanus*, *S. taiwanus*, *S. devilleanus*, *S. dominicanus*, *S. novioninus*, *S. schulzianus*, *S. morrisianus*, *S. schlegeli*, *S. infelix*, *S. fuscus*, *S. brachypus*, *S. hollandianus*, *S. orthopus*, *S. blakistoninus*, *S. dolichorhinus*, *S. legrandianus*, *S. aplo-dontus*, *S. mitratus*, *S. yesonensis*, *S. sylvanus*, *S. zendaiensis*, *S. dybowskii*, Taksz., *S. mandchuricus*, Swinh., *S. microspilus*, *S. mandarinus*, M.-Edw., and *S. grassianus*; of these 34 are new. *C. simplicidens*, *C. triplidens*, *C. sivalensis*, spp. nn., LYDEKKER (207), from the Siwaliks.

Rangifer tarandus. GREWINGK (128), note on its former occurrence in the Baltic provinces; DAMES (87), on Reindeer remains from Rixdorf, near Berlin.

Alces machlis: KÖPPEN (172), on its distribution in European Russia.

Capreolus capræa. HARTING (138), on its occurrence in Dorsetshire. HARTING (140), on abnormal antlers of the roe.

Hydropotes argyropus, sp. n., HEUDE (146), from the Corea.

Cariacus virginianus. CATON (57), abnormal antlers from Texas; TRUE (344), abnormal antlers. *C. macrotis*, *C. leucurus*: GROUEN (130), notes on their distribution. *C. paludosus*, *C. campestris*, *C. rufus*, *C. nemorivagus*, *C. rufinus*: NEHRING (247), descriptions of skulls.

Coassus santorii: NEHRING (249), description of an example from Vera Cruz.

TRAGULIDÆ.

Tragulus sivalensis, sp. n., LYDEKKER (207), from the Siwaliks.

Hyamoschus crassus: TOULA (340), its occurrence in the Turnau bone-caves in Styria.

XIPHODONTIDÆ.

Oxacron minimus, g. & sp. nn., FILHOL (109), allied to *Cainotherium*, from the Mouillac phosphate beds.

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Eucrotaphus trigonocephalus, sp. n., COPE (73), John Day Epoch, Oregon.

Merycochærus chelydra, *M. macrostegus*, spp. nn., COPE (73), John Day Epoch, Oregon; *M. montanus*, *M. avenarum*, *M. pariogonus*, spp. nn., COPE (73), Ticholeptus beds, Montana.

Cyclopidius emydinus, sp. n., COPE (73), Deep River, Montana.

Pithecostis decidens, sp. n., COPE (73), Deep River, Montana.

Agriochærus trifrons, sp. n., COPE (73), Oregon.

ANTHRACOTHERIDÆ.

Anthracotherium : TELLER (332), monograph of the genus. *A. illyricum*, sp. n., TELLER (332), from S. Styria.

Anthracotherium sp., LYDEKKER (212), from Hempstead Beds, Isle of Wight.

Merycoptamus nanus, sp. n., LYDEKKER (211), from the Siwaliks.

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Sus scrofa : BARNES (16), on the development of the spinal cord.
S. scrofa nanus : NEHRING (244), on its skull. *S. phacochariodes*, sp. n. P. THOMAS (338), fossil from Algeria.

Hyotheium sindiense, sp. n., LYDEKKER (207), from the Siwaliks.

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Hippopotamus amphibius : SIGEL (311), on a specimen in the Zoological Gardens at Hamburg.

8. SIRENIA.

HALITHERIDÆ.

Halitherium chouqueti, sp. n., GAUDRY (123), from the Paris Basin.

RHYTINIDÆ.

Rhytina gigas. STEJNEGER (321), as to the date of its extermination.

MANATIDÆ.

Manatus americanus. ALBRECHT (9), discovery of terminal epiphyses on the Manatee's vertebræ.

9. CETACEA.

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SOUTHWELL (317), on the whale fishery in 1882.

JOUAN (164), on whales captured about the coasts of Europe from 1879-85.

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Balæna biscayensis. GULDBERG (132), finding of its bones in Finmark.

Balanoptera rostrata : P. VAN BENEDEN (27), on its distribution. B.

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borealis : GULDBERG (131), descriptions and accounts of its habits. *B. musculus*, *B. sibbaldii* : COCKS (65), account of their habits, and the mode of capture ; T. J. PARKER (265), on the Baleen and skeleton of a specimen of *B. musculus* captured off New Zealand.

Megaptera boops. COCKS (65), account of its habits, and mode of capture.

Mesocetus agrami. P. VAN BENEDEN (28), fossil, description of cranial cavity and vertebral column.

PHYSETERIDÆ.

Physeter macrocephalus. BEAUREGARD (22), note on the heart and larynx ; POUCHET & BEAUREGARD (275), note on the formation of spermaceti.

Mesoplodon layardi. JAGGARD (157A), its occurrence off the coast of Queensland.

Ziphius layardi. VIS (358D), measurements and description.

Chenoziphius planirostris. CAPELLINI (55), recorded from Pliocene strata near Siena.

DELPHINIDÆ.

Monodon monoceros. FLOWER (117), general account.

Phocaena communis. CLELAND (64), note on its viscera.

Globicephala. FLOWER (119), substitute for *Globiceps*. *G. melas* : H. F. MULLER (236), history of its capture near the Farøe Isles.

Prodelphinus. FLOWER (119), substitute for *Clymenia* or *Clymene*.

Delphinus delphis : BOULARD & PILLIET (40), on the stomach of the Dolphin. *D. albirostris* : CLELAND (64), notes on its viscera.

Neomeris kurrachiensis, sp. n., MURRAY (239), from Kurrachee.

10. EDENTATA.

W. K. PARKER (267), on the structure and development of the skull.

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Oracanthus burmeisteri, g. & sp. nn., AMEGHINO (11), from the Rio Lujan, Argentine Republic.

MYRMECOPHAGIDÆ.

Myrmecophaga jubata. M. SCHMIDT (302), on the habits of the Great Ant-eater.

11. MARSUPIALIA.

COPE (77). The Tertiary Marsupials, with descriptions of the families. CALDWELL (52), on the arrangement of the foetal membranes of Marsupials.

PHALANGISTIDÆ.

Phalangista vulpecula: POULTON (276), description of the ovarian ovum. *P. (Hemibelideus) lemuroides*, *P. herbetensis*, *P. (Pseudochirus) archeri*, spp. nn., COLLETT (69), from Northern Queensland. *P. (Pseudochirus) schlegelii*, sp. n., JENTINK (160), from New Guinea. *P. (Pseudochirus) caudivolvulus*, *Trichosurus vulpecula*: JENTINK (161), notes on the nomenclature of these species.

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Dendrolagus lumholtzii, sp. n., COLLETT (69), from Northern Queensland.

Dorcopsis chalmersii, sp. n., MIELOUHO-MACLAY (225), from Southeast New Guinea.

Potorous (= *Hypsiprinus*) *rufus*, sp. n., HIGGINS & PETTERD (147), from Tasmania.

Onychogale annulicauda, sp. n., C. W. DE VIS (358c), from Gulf of Carpentaria.

Halmaturus jardinii (Cape York), *H. gazella* (Somerset), *H. temporalis* (Moreton Bay and Darling Downs), spp. nn.; *id.* (358b).

PERAMELIDÆ.

Perameles (Brachymelis) garagassi, subgn. & sp. nn., MIELOUHO-MACLAY (225), from the Maclay coast of New Guinea; the subgenus *Brachymelis* also includes *Perameles doreyanus*, *P. rufescens*, and *P. coquerellii*. *P. bougainvillei*, C. W. DE VIS (358A).

DASYURIDÆ.

Antechinus moorei, sp. n., HIGGINS & PETTERD (147), from Tasmania.

Antechinus concinnus, sp. n., *A. moorei* var. *assimilis*, var. & sp. nn., *id.* (148).

DIDELPHYIDÆ.

O. THOMAS (335). General account of the family.

Didelphys pygmaea, sp. n., SCOTT (308), fossil from Chalk Bluffs, Colorado, U.S.A.

PLAGIAULACIDÆ.

Chirox plicatus, g. & sp. nn., *Catopsalis fissidens*, sp. n., COPE (71), fossil from Puerco beds.

12. MONOTREMATA.

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CALDWELL (53): discovery of the eggs of Monotremes,

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Echidna hystrix. BEDDARD (24), on the presence of an anterior abdominal vein; GEGENBAUR (125), note on the mammary glands; HAACKE (135) claims priority of discovery that *Echidna* is oviparous; OWEN (262), description of uterine ova, with accounts of the discoveries of Mr. Caldwell from Australian papers.

Echidna acanthion, sp. n., COLLETT (67), from North Queensland. *E. (Tachyglossus)*: LUTKEN (205), on the possibility of there being another species in Australia. *E. ramsayi*: OWEN (261), description of fossil humerus from Wellington Breccia Cave, N.S.W.

Proechidna villosissima, sp. n., DUBOIS (98), from New Guinea.

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Ornithorhynchus anatinus. POULTON (276), on the ovarian ovum; GUNN (133), on the eye.

13. GENERA INCERTÆ SEDIS.

Pleuraspidotherium. LEMOINE (197): note on the relations of this fossil from the Lower Eocene of Rheims, which is allied to both the Palæotheria and the Marsupials.

Tritylodon longævus, g. & sp. nn., OWEN (263), a triassic Mammal from South Africa; its systematic position is uncertain. NEUMAYR (252) compares *Tritylodon* to *Triglyphus* of Fraas.

A V E S.

BY

A. H. EVANS, M.A., F.Z.S.

AMONG the events of importance to the ornithological world which have taken place during the year 1884, may be mentioned the inauguration of the American Ornithologists' Union and the first International Ornithological Congress, held at Vienna. Many important works have either been begun or have advanced a stage. For those which relate to GEOGRAPHICAL AREAS the following names may be consulted, as well as Dresser, Gadow, Gurney, Newton, Sclater, on other points :—

PALÆARCTIC REGION : Bogdanow (Russia), Booth (Britain), Chapman (Spain), Giglioli (Italy), Martorelli (Sardinia), Menzbier (Russia), Olphe-Galliard (W. Europe), Saunders (W. Europe and Britain), Seebohm (Britain).

ETHIOPIAN : Bocage (W. Africa), Böhm (Cent. Africa), Fischer & Reichenow (E. Africa), Hargitt (Ethiopian region), Johnston (Congo), Layard (S. Africa), Rochebrune (Senegambia), Salvadori (Shoa), Schalow (E. Africa), Sharpe (Equat. Africa).

ORIENTAL : Blasius (Borneo), Forbes (Timor Laut), Gould (Asia), Kutter (Borneo), Madarász (Burma), C. H. Marshall (Himalayas), Meyer (E. Ind. Archipel.), Murray (Sind), Przewalski (Tibet), Radde (Caucasus), Salvadori (Timor Laut), Seebohm (Japan, China, Persia), Sharpe (Palawan), Tristram (Palestine), Vorderman (Java), Wardlaw-Ramsay (Philippines).

AUSTRALIA AND OCEANIA : Buller (New Zealand), Finsch (South Sea), Gould (New Guinea), Potts (New Zealand), Sharpe (New Guinea).

NEARCTIC : Baird, Brewer, & Ridgway, Coues, Ridgway, Stejneger.

NEOTROPICAL : Berlepsch (Venezuela, New Granada, Ecuador), Blasius (Cochabamba), Cory (Haiti), Godman & Salvin (Cent. America), Taczanowski (Peru), Tristram (San Domingo).

For Extinct Species, see: Dames, Jaccard, Lydekker, Owen, Paulow, Woldrich.

For Anatomical and Physiological Papers, see: Beddard, Csokor, Dareste, Duval, Ficalbi, Fol, Fromann, Gadeau de Kerville, Gardiner, Geberg, Hamonville, Helm, Landois, Maggiorani, Menzbier, Moseley, Nathusius-Konigsborn, Shufeldt, Taczanowski, Tarchanoff, Wiedersheim.

A new magazine has been issued at Buda-Pest, the "Zeitschrift für die Gesammte Ornithologie"; while the "Bulletin of the Nuttall Ornithological Club" is continued as "The Auk."

THE GENERAL SUBJECT,

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

Report on the Migration of Birds in the Spring and Autumn of 1883, by J. A. Harvie-Brown, J. Cordeaux, R. M. Barrington, & A. G. More. London: 1884, 8vo, pp. 1-129.

Report of the Committee for obtaining Observations on the Migration of Birds at Lighthouses and Lightvessels, and for reporting on the same. Rep. Brit. Ass. 1884, pp. 266-270.

Including returns from Skykkesholm, Iceland; Heligoland; Stevns, Zealand; Great Britain and Ireland, excepting the W. Coast of England and the Isle of Man.

"Inauguration" of the American Ornithologists' Union. Ibis, 1884, pp. 60-66. [Extracted from Bull. Nutt. Orn. Club.]

Second Meeting of the Am. Orn. Union. Report of Committees—(i.) on the Revision of Nomenclature and Classification of N. A. Birds; (ii.) on the Eligibility or Ineligibility of the European House Sparrow in America; (iii.) on Avian Anatomy; (iv.) on Oology; (v.) on Migration; (vi.) on Faunal Areas. The two latter were merged in one called a Committee on the Migration and Geographical Distribution of N. A. Birds. Auk, i. pp. 369-379.

Sitzungs-Protokolle des ersten internationalen Ornithologen-Congresses welcher, vom 7 bis 11 April, 1884, in Wien abgehalten wurde. Wien: 1884, 4to.

An official account of the proceedings of the International Ornithologists' Congress at Vienna. [See also Monat. deutsch. Ver. zum Schutze d. Vogelwelt, 1884, No. 5; and Zool. 1884, pp. 139, 188, & 346.]

VII. Jahresbericht (1882) des Ausschusses für Beobachtungsstationen der Vögel Deutschlands. J. f. O. 1884, pp. 1-52.

The occurrence of Birds in the German Empire, their arrivals, departures, breeding habits, and life-history.

Jahresbericht (1882) des Comité's für ornithologische Beobachtungsstationen in Oesterreich und Ungarn von V. v. Tschusi zu Schmidhoffen. Wien: 1883, 8vo, x., 201, & viii. pp.

Periodische Erscheinungen des Thier- und Pflanzenreiches in Schleswig-Holstein (1878-1883). Schr. Nat. Ver. Schl.-Holst. 1884, pp. 69-80.

Notices of the first appearance and the disappearance of 11 species, (pp. 73-76).

Ornithologische Beobachtungen aus der Umgebung Wiens. MT. orn. Ver. Wien, 1884, pp. 33 & 34.

AGASSIZ, A. Annual Report of the Curator of the Museum of Comparative Zoology at Harvard College, for 1883-84. Cambridge, Mass. : 1884, 8vo.

ALLEN, J. A. Zoological Nomenclature. Report of a Meeting in London to discuss the trinomial principle. Auk, i. pp. 338-353.

ALTUM, Dr. [See *Syrnium uralense* (*Striges*).]

AYRES, T. Additional Notes on the Ornithology of Transvaal. Communicated by J. H. GURNEY. Ibis, 1884, pp. 217-233. [Cf. Zool. Rec. xvii. *Aves*, p. 2.]

11 species are added. [See *Circaetus cinereus* and *Tinnunculus pekinensis* (*Falconidæ*), *Hyphantornis mariquensis* (*Ploceidæ*).]

BABINGTON, CHURCHILL. Catalogue of the Birds of Suffolk ; with an introduction and remarks on their distribution. [Reprinted from P. Suff. Inst. Archæol. & Nat. Hist.] Bury St. Edmunds : 1884, 8vo. Part i. Land Birds, pp. 1-110; map, and explanation of it.

BAILEY, H. B. [See *Rostrhamus sociabilis plumbeus* (*Falconidæ*).]

BAIRD, S. F., BREWER, T. M., & RIDGWAY, R. The Water Birds of North America ; being vols. xii. & xiii. of Memoirs of the Museum of Comparative Zoology at Harvard College, but issued in continuation of the Publications of the Geological Survey of California. Boston : 1884, 4to, 2 vols. : vol. i. pp. i.-xi. & 1-537 ; vol. ii. pp. 1-552.

The technical part has been brought down to date ; the biographical portion less so, owing to the death of Dr. Brewer. There are many changes in nomenclature, and 23 species are added which are not in Ridgway's "Nomenclature of N. A. Birds." Some of these are new, others are new to America only. The new species and subspecies added during the last two years are *Ardea vardi* (*Ardeidæ*), *Rallus beldingi* (*Rallidæ*), *Pelecanus californicus* (subsp.), *Phalacrocorax pelagicus robustus* and *P. dilophus albociliatus* (*Pelecanidæ*), *Larus kumlien*, *L. nelsoni*, *L. schistisagus* (*Laridæ*), *Puffinus borealis* and *Æstrelata fisheri* (*Procellariidæ*). 2 specific names are cancelled, *Chen albatus* (*Anatidæ*) and *Brachyrhamphus brachypterus* (*Alcidæ*). The Classification is primarily into Waders and Swimmers, secondarily into nine Orders :—i., *Herodiones* ; ii., *Limicolæ* ; iii., *Alectorides* ; iv., *Phanicopteri* ; v., *Anseres* ; vi., *Steganopodes* ; vii., *Longipennes* ; viii., *Tubinares* ; ix., *Pygopodes*. An exhaustive review ; Auk, 1884, pp. 382-386.

BANKS, J. W. [See *Buteo pennsylvanicus* (*Falconidæ*).]

BARRINGTON, R. M. [See *Sula bassana* (*Pelecanidæ*).]

BARROWS, W. B. Birds of the Lower Uruguay. Auk, i. pp. 20-30, 109-113, 270-278, & 313-319.

A continuation from Bull. Nutt. Orn. Club, viii. p. 212. Pt. 1 includes 36 species ; pt. 2, 12 species ; pt. 3, 43 species ; and pt. 4, 24 species ; ranging from *Dendrocolaptidæ* to *Struthiones*. [See *Guirra piri-rigua* (*Cuculidæ*), *Polyborus tharus* (*Falconidæ*).]

BATCHELDER, C. F. [See *Picicorvus columbianus* (*Corvidæ*), *Stercorarius buffoni* (*Laridæ*).]

BAUR, J. G. Note on the Pelvis in Birds and Dinosaurs. *Am. Nat.* 1884, pp. 1273-1275.

BAYERN. [See LUDWIG.]

BEDDARD, F. E. A Contribution to the Anatomy of *Scopus umbretta*. *P. Z. S.* 1884, pp. 543-553.

The pterylosis and structure of the skeleton tend to ally this bird rather to the *Ciconiidae* than to the *Ardeidae*, the powder-down patches of which are absent. The tongue, unlike that of most *Ardeidae*, is small, but the syrinx is not Ciconiine but Ardeine; in other points, *Scopus* resembles the *Ardeidae*, not the *Ciconiidae*. *Scopus* has not the "ambiens," but the "semitendinosus" and the "femoro-caudal" (this is no test in the present case), and in the condition of the pectoral muscle it agrees with the Herons and not the Storks. In the deep plantar tendons it is not essentially Ciconiine, but in the absence of the expansor secundariorum it differs from all the *Ardeidae*, with the exception of two genera. On the whole, *Scopus* combines the muscular characters of both the above families, from which a most intimate connexion between them is deduced.

BELL, R. Notes on the Birds of Hudson's Bay. *Tr. R. Soc. Canada*, i. Sec. iv. pp. 49-54.

BERLEPSCH, H. v. On a Collection of Bird Skins from the Orinoco, Venezuela. *Ibis*, 1884, pp. 431-441.

See *Sycalis columbiana* (*Fringillidae*), *Cyanocorax violaceus* (*Corvidæ*), *Cnipolegus orenocensis*, sp. n. (*Tyrannidae*), *Urubitinga zonura* and *Antenor uncinatus* (*Falconidae*), *Cathartes urubitinga* (*Cathartidae*), *Ardea cocoi*, *A. sibilatrix*, *Tigrisoma brasiliense*, and *Nycticorax gardeni* (*Ardeidae*), *Tantalus loculator* (*Ciconiidae*), *Opisthocomus cristatus* (*Opisthocomidae*), *Aramus scolopaceus* (*Aramidae*), *Eurypyga helias* (*Eurypygidæ*), and *Totanus melanoleucus* (*Scolopacidae*). 43 species are enumerated in all by the author.

—. Diagnosen einiger neuen Vogelarten aus der Umgegend von Bucaramanga, Neu Granada. *J. f. O.* 1884, pp. 249 & 250. [See *Thryophilus minlosi* (*Troglodytidae*), *Phyllomyias cristatus* and *Todirostrum lenzi* (*Tyrannidae*), spp. nn.]

—. Untersuchungen über die Vögel der Umgegend von Bucaramanga in Neu Granada. *T. c.* pp. 273-320.

A list of 151 species, of which 3 are new. [See above.]

—. [See also *Picumnus jheringi*, sp. n. (*Picidae*).]

—, & TACZANOWSKI, L. Deuxième liste des oiseaux recueillis dans l'Ecuadeur occidentale par MM. Stolzmann et Siemiradski. *P. Z. S.* 1884, pp. 281-313, pl. xxiv. [Cf. *Zool. Rec.* xx. *Aves*, p. 3.]

A list of Birds from the west side of the Cordilleras, including 177 species. [See *Ilenicorhina hilaris*, sp. n. ? (*Troglodytidae*), *Chlorospingus*

ochraceus, sp. n., (*Tanagridæ*), *Pæcilotriccus*, g. n. (*Tyrannidæ*), *Automolus holostictus striatidorsus*, sp. n. ? (*Dendrocolaptidæ*), *Bubo nigrescens*, sp. n. (*Strigidæ*). *Chlorospingus ochraceus* (*Tanagridæ*) and *Spermophila pauper* (*Fringillidæ*) are figured.

BICKNELL, E. P. A Study of the Singing of our [American] Birds. Auk, i. pp. 60-71, 126-140, 209-218, & 322-332.

The author wishes to connect the period when the birds are not moulting, with the song, and possibly, with migration. He discusses the notes of the different species.

BIDWELL, E. [See *Xema sabini* (*Laridæ*).]

BLAKISTON, T. W. Amended List of the Birds of Japan, according to Geographical Distribution; with notes concerning additions and corrections since January, 1882. London: 1884, 8vo, pp. 1-68; (for private circulation). [See *Diomedea nigripes*, *Puffinus carneipes* (*Procellariidæ*).]

BLANFORD, W. T. Report on the Collection of Drawings of Himalayan Birds lately presented to the Zoological Society's library by Mr. Brian H. Hodgson, F.Z.S. P. Z. S. 1884, pp. 56 & 57.

BLASIUS, R. Naturhistorische Studien und Reiseskizzen aus Schweden und Norwegen im Frühjahr, 1884. MT. orn. Ver. Wien, 1884, pp. 97-100, 116-120, 129-138, & 145-151.

The author gives an account of his visits to various museums.

BLASIUS, W. Zur Geschichte des Ueberreste von *Alca impennis*, Linn. J. f. O. 1884, pp. 58-176.

A very elaborate account of the various remains of this species known to exist in collections public or private, giving many details of their history. The number of skins is 77, of skeletons 9, besides many detached bones, and of eggs 68; of internal organs there are only a few from one example in the Museum at Copenhagen.

— . Neue Thatsachen in Betreff der Ueberreste von *Alca impennis*, Linn. Tageblatt d. Nat. Versamm. zu Magdeburg, 1884, p. 321.

Additional information, rectification of mistakes, and tracing of specimens.

— . Ueber Vögel-Brustbeine. J. f. O. 1884, pp. 228 & 229.

— . Ueber die neuesten Ergebnisse von Herrn F. J. Grabowsky's ornithologischen Forschungen in Süd-Ost-Borneo. T. c. pp. 210-224.

On a second collection of 85 skins. [For first collection, cf. Zool. Rec. xx. Aves, p. 3.] Those of special interest are *Machæramphus alcinus* (*Falconidæ*), *Alcedo euryzona* (*Alcedinidæ*), *Philentoma pyrrhopterum* (*Muscicapidæ*), *Arachnothera chrysogenys* and *A. crassirostris* (*Nectariniidæ*), *Pycnonotus salvadorii* (*Pycnonotidæ*). [See also *Falconidæ*, *Strigæ*, *Caprimulgidæ*, *Cypselidæ*, *Muscicapidæ*, *Pycnonotidæ*, *Scolopacidæ*, *Rallidæ*, *Parridæ*, *Ardeidæ*, *Anatidæ*.]

[BLASIUS, W.] Die Raubvögel von Cochabamba. MT. orn. Ver. Wien, 1884, pp. 141 & 142.

An addition to E. v. Boeck's first paper on the birds of Cochabamba [*infra*]. Several generic and specific names are corrected, and *Circus cinereus* (*Falconidae*) and *Pholeoptynx cunicularia* (*Striges*) are added to Boeck's list.

— [See also *Psophia cantatrix* (*Psophiidae*).]

BLYTH, E. [the late]. Three Unpublished Papers on Ornithology. Zool. 1884, pp. 201–211 (*Certhiidae*), 247–264 (*Capitonidae*), & 300–327 (*Cypselidae*).

BOCAGE, J. V. BARROZA DU. Aves das possessões portugezas da Africa occidental. Vigesima quinta lista. J. Sci. Lisb. xxxiv. p. 81 [1883]. [*Cf.* Zool. Rec. xx. *Aves*, p. 4.]

— [See also *Cinnyris erikssoni* (*Nectariniidae*).]

BOECK, E. v. Ornith. des Thales von Cochabamba in Bolivia und der nächsten Umgebung. MT. orn. Ver. Wien, 1884, pp. 100–102 & 161–168. [See *Aquila boliviara*, sp. n. ? (*Falconidae*).]

BOGDANOW, M. Conspectus Avium Imperii Rossici, part i., 4to, pp. 1–122. St. Petersburg : 1834.

This work is intended to contain (i.) a list of the birds of Russia, (ii.) their bibliography, (iii.) an account of their distribution, (iv.) a record of ornithological discoveries made in the empire, and (v.) a catalogue of the birds in the Museum of the Academy of Science at St. Petersburg. Part i. contains the Orders *Columbæ*, *Heteroclitæ* [under which the writer includes *Pteroclidæ*, *Tinocoridae*, *Glareolidae*], *Gallinæ*, *Hydrogallinæ* [*Rallidae*], and *Grallæ*. [See *Tetrao urogalloides* var. n. *sachalinensis*, *Lagopus rupestris*, subsp. n. ? *insularis*, *Coturnix ussuriensis*, sp. n. (*Tetraonidae*), and *Butorides schrenki*, sp. n. (*Ardeidae*).]

BÖHM, R. Aus Marungu [a letter]. Z. Ges. Orn. 1884, pp. 105–112. [See *Musophaga boehmi*, sp. n., and *Corythaix livingstoni* (*Musophagidae*), *Hapaloderma narina* (*Trogonidae*), *Numida coronata marungensis* (*Phasianidae*).]

— Neue Vogelarten aus Central-Afrika. J. f. O. 1884, pp. 176–178. [See *Lanius schalowi* (*Laniidae*), *Pyromelana nigrifrons* (*Ploceidae*), *Crex lugens* (*Rallidae*), spp. nn.] These species were determined by H. Schalow from eight species, supposed to be new, sent by R. Böhm.

BOLAM, G. [See *Muscicapa parva* (*Muscicapidae*).]

BONOMI, A. Avifauna Tridentina. Rovereto : 1884, 8vo, pp. 1–67.

BOOTH, E. T. Rough Notes on the Birds observed during twenty years' shooting and collecting in the British Islands. Parts vi., vii., & viii. London : 1884, folio, discontinuous pagination. [*Cf.* Zool. Rec. xx. *Aves*, p. 4.]

Containing Starling, Dipper, Fieldfare, Thrush, Blackbird, Blackcap, Ptarmigan, Peewit, Redshank, Purple Sandpiper, Coot, Arctic Skua,

Rook, Tree-Sparrow, Redwing, Golden-crested Wren, Whimbrel, Eider, Goosander, Common Gull, Herring Gull, Pomatorhine Skua, Montagu's Harrier, Greenfinch, Twite, Missel Thrush, Quail, Woodcock, Jack Snipe, Land Rail, Spotted Crake, Brent Goose, Whooper, Pochard, Goldeneye, and Long-tailed Skua. Plates are given of Ptarmigan (3), Arctic Skua (4), Red-breasted Merganser (1), Eider (3), Goosander (2), Pomatorhine Skua (3), Montagu's Harrier (2), Woodcock (2), Whooper (1), Pochard (1), Goldeneye (1), and Longtailed Skua (1).

BORRER, W. [See *Botaurus lentiginosus* (*Ardeidae*).]

BRAUNS, D. [See *Corvus japonensis* (*Corvidae*).]

BREWER, T. M. [See BAIRD, S. F.]

BREWSTER, W. Notes on the Summer Birds of Berkshire County, Massachusetts. Auk, i. pp. 5-16.

An account of a visit during the breeding season, a time at which the birds of the district have never been noticed. 4 species were met with which were not known before to summer in the county. Mount Graylock is described, as regards its fauna, as "a Canadian island rising from an Alleghanian sea."

— The New English Canaan of Thomas Morton. [With notes by W. Brewster and the Editor (C. F. Adams).] Chap. iv. Of Birds and Feathered Fowles, pp. 189-199. Boston: 1883, 4to, pp. i.-vi. & 1-381.

— [See also *Dendroica maculosa*, *Geothlypis philadelphia*, and *Mniotilta varia* (*Mniotiltidae*), *Larus kumlieni* (*Laridae*).]

BRONN, H. G. Klassen und Ordnungen des Thier-reichs, wissenschaftlich dargestellt in Wort und Bild. Fortgesetzt von Dr. Hans Gadow in Cambridge. Sechster Band, iv. Abtheilung. Vögel: Aves (B. Muskeln der Extremitäten), 7, 8, 9 Lieferung, pp. 89-176. Leipzig und Heidelberg: 1884.

A continuation from 1870, when the last parts (5 & 6) were published. The whole of the myology, as far as it was written by Selenka, has been cancelled; the whole of the osteology being retained.

BROOKS, W. E. [See *Certhia mandellii* (*Certhiidae*), *Linota linaria* (*Fringillidae*), *Aquila imperialis*, *A. naevia*, *Falco atriceps*, *Milvus govinda* (*Falconidae*), *Ægialitis curonica*, *Æ. minuta* (*Charadriidae*).]

BROWN, N. C. A Second Season in Texas. Auk, i. pp. 120-124. [Cf. Zool. Rec. xix. Aves, p. 3.]

13 species are added to the former list, 2 are more fully identified, and 1 is corrected.

BROWNE, F. C. [See *Geothlypis trichas* (*Mniotiltidae*), *Lanius ludovicianus* (*Laniidae*).]

BRUSINA, S. Sastanak ornitologa i Izlozba Ptica u Becu. Zagreb [Agram]: 1884, 8vo, pp. 1-77, 1 pl.

An account of the Ornithological Congress at Vienna, and its results also of the Exhibition of Birds at the same place.

BRYANT, W. E. [See *Myiadestes townsendi* (*Sylviidae*).]

BUCHNER, E. Die Vögel des St. Petersburger Gouvernements; Materialien, Literatur, und Kritik.

Extracted from the Journal of the Nat. Hist. Soc. of St. Petersburg, xiv. pp. 358-624. The original is in Russian; this title is taken from Z. Ges. Orn. 1884, p. 401.

BUCKLEY, T. E. A few Notes on the Mammals and Birds of Rousay, one of the Orkney Islands. P. N. H. Soc. Glasg. 1883-84, pp. 41-76.

—, & HARVIE-BROWN, J. A. The Vertebrate Fauna of Sutherlandshire.

This is an Appendix to the late C. St. John's "Tour in Sutherland," 2nd Ed. (Edin.: 1884). Buckley takes the eastern, and Harvie-Brown the western and northern divisions of the county. Pp. 291-374.

BULLER, W. L. On some Rare Species of New Zealand Birds. Tr. N. Z. Inst. 1883, pp. 308-318.

The writer describes the breeding of *Sceloglaux albifacies* (*Striges*), and the occurrence of *Hylochelidon nigricans* (*Hirundinidae*), *Anthochaera* [sic] *carunculata* (*Meliphagidae*), and resuscitates *Creadion cinereus* (*Sturnidae*), *Platycercus alpinus* (*Psittaci*). He also gives an account of the habits of *Nestor notabilis* (*Psittaci*), and states that *Charadrius fulvus* (*Charadriidae*) has been found breeding in New Zealand.

BUNGE, A. Naturhistorische Beobachtungen und Fahrten im Lena-Delta; aus Briefen an den Akademiker L. v. Schrenck. Mém. Biol. 1884, pp. 31-107.

Includes a list of the birds observed (50 species) and the nests found. [See especially *Cygnus bewickii*, *C. olor* (*Anatidae*), *Charadrius squatarola* (*Charadriidae*), *Tringa minuta* (*Scolopacidae*), *Rhodostethia rossii* (*Laridae*).]

CABANIS, J. Ueber interessante von Herrn von Madarász in Pest mitgetheilte Varietäten. J. f. O. 1884, pp. 196 & 197.

The writer mentions a hybrid between *Cyanistes cyaneus* and *Poecile borealis*, a variety of *Muscicapa grisola* and another of *Lophophanes cristatus*.

—. Bastardirung in der Freien Natur. T. c. p. 197.

—. [See also *Anthus antarcticus*, sp. n. (*Motacillidae*), *Lanius major* (*Laniidae*), *Bradyornis* and *Melanornis*, *Melanopepla tropicalis*, sp. n. (*Dicruridae*).]

CAPEK, W. Ornithologische Beiträge aus Mähren. MT. orn. Ver. Wien, 1884, pp. 5 & 6.

Notes on ornithology from Moravia. [See DALBERG, F. v., and *Turdus pilaris* (*Turdidae*), *Muscicapa parva* (*Muscicapidae*).]

CARTER, T. [See *Coccothraustes vulgaris* (*Fringillidae*).]

CATTANEO, G. Recherches sur la structure normale des corpuscles de Pacini chez les oiseaux. Arch. Ital. Biol. vi. Fasc. 1, pp. 6-34, pl.

- [CATTANEO, G.] Istologia e sviluppo dell' apparato gastrico degli ucelli
Milano : 1884, 8vo, 88 pp., 4 pls. Estr. degli Atti Soc. Ital. xxvii.
- CHAMBERLAIN, M. [See *Regulus calendula* (Sylviidæ).]
- CHAPMAN, A. Rough Notes on Spanish Ornithology. Ibis, 1884,
pp. 66-99, pl. iv. [See *Gyps fulvus*, *Aquila imperialis* [adalberti]
(Falconidæ), *Otis tarda* and *O. tetrax* (Otididæ), *Pterocles alchata*
(Pteroclidæ), *Larus gelastes* and *L. melanocephalus* (Laridæ), *Eris-
matura mersa* (Anatidæ), and *Phænicopterus antiquorum* (Phæni-
copteridæ).]
- CLARK, J. N. [See *Sitta carolinensis* (Sittidæ), *Porzana jamaicensis*
(Rallidæ).]
- CLARKE, W. E. Field Notes from Slavonia and Hungary, with an
Annotated List of the Birds observed in Slavonia. Ibis, 1884,
pp. 125-148. [See *Ardea bubulcus* (Ardeidæ), *Platalæa leucorodiu*
and *Plegadis falcinellus* (Platalaidæ).]
- . [See also *Œstrelata hesitata* (Procellariidæ), *Coccothraustes vul-
garis* (Fringillidæ).]
- & ROEBUCK, W. D. [See *Turdus varius* (Turdidæ), *Daulias lus-
cinia* (Sylviidæ), *Puffinus griseus*, *Procellaria leucorrhœa* (Procel-
lariidæ).]
- COCKS, A. H. [See *Pagophila eburnea* (Laridæ).]
- COLLETT, R. [See *Ardetta minuta* (Ardeidæ), *Sterna cantiaca* and *Larus
minutus* (Laridæ), *Alca impennis* (Alcidæ).]
- COLLINS, J. W. [See *Laridæ*, *Procellariidæ*.]
- CONWENTZ [Dr.]. Die einheimische Wirbelthier-Fauna. Schr. Ges.
Danz. 1884, pp. 9-17.
Notes (pp. 11-13) on birds of rare occurrence in West Prussia.
- COOKE, W. W. Bird Nomenclature of the Chippewa Indians. Auk, i.
pp. 242-250.
The names of 126 species are given.
- . [See also *Zonotrichia querula* (Fringillidæ).]
- & WIDMANN, O. Bird Migration in the Mississippi Valley. [Re-
printed from American "Field," 1883, Vol. xx. No. 22, Vol. xxi.
No. 3.] Ridgway Orn. Club, Chicago, 1883, No. 1.
- CORDEAUX, J. The Sea Birds at Flamborough. Naturalist, ix. pp.
93-95.
- CORY, C. B. Description of several New Birds from Santo Domingo.
Auk, i. pp. 1-5.
- . [See *Ligea* (scr. *Ligia*, fide "Ibis") *palustris*, g. & sp. nn. (*Unio-
tiltidæ*), *Hirundo sclateri*, sp. n. (*Hirundinidæ*), *Calyptophilus* (g. n.)
frugivorus (*Tanagridæ*), *Rupornis ridgwayi* (*Falconidæ*), and *Œdicne-
mus dominicensis* (*Œdicnemidæ*).] The name *Ligea* being preoccupied,
the author substitutes *Microligea* ; t. c. p. 290.

[CORY, C. B.] *The Birds of Haiti and San Domingo.* Boston : 1884, 4to, pts. i., ii., & iii. pp. 1-160, pls. i. (map)-xx. [1885, pt. iv. (completing the work)].

For the new species, see above. 2 species also in this paper were originally described by the author [*cf.* Zool. Rec. xviii. *Aves*, pp. 32 & 39], *Myiadestes montanus* (*Sylviidæ*) and *Phœnicophilus dominicensis* (*Tanagridæ*), and there are 19 plates of Birds, 3 of their heads, and a map of the island.

— [See also *Bernicla brenta nigricans* (*Anatidæ*).]

COUES, E. *Key to North American Birds.* Containing a concise account of every species of living and fossil Bird at present known from the Continent north of the Mexican and United States boundary, inclusive of Greenland. Second edition, revised to date, and entirely rewritten : with which are incorporated "General Ornithology," an outline of the Structure and Classification of Birds; and "Field Ornithology," a manual of collecting, preparing, and preserving Birds. London & Boston : 1884, 8vo, pp. i.-xxx. & 1-863.

This second edition of the "Key" contains about 350 new illustrations, and is entirely rearranged. About a dozen species and subspecies are included which are not found in "Coues' Check List," and two subspecies are described for the first time, viz., *Parus hudsonicus evura* (*Paridæ*) and *Junco hiemalis connectens* (*Fringillidæ*), from Alaska and Colorado respectively. For a review of the work, see *Auk*, 1884, pp. 282 & 283.

— Ornithophilologicalities. *Auk*, i. pp. 49-58 & 140-144.

(i.) A reply to Prof. Merriam's criticisms on the "Coues' Check List and Lexicon." (ii.) A further discussion on derivations.

— On some New Terms recommended for use in Zoological Nomenclature. *T. c.* pp. 320-322.

— [See also *Molothrus ater* (*Icteridæ*).]

— & PRENTISS, D. W. *Avifauna Columbiana*; being a List of Birds ascertained to inhabit the District of Columbia, with the times of arrival and departure of such as are non-residents, and brief notices of habits, &c. 2nd ed., entirely rewritten. Bull. U. S. Nat. Mus. No. 26. Washington : 1883, 8vo, pp. 1-133, front, 4 maps, and woodcuts.

COURTOIS, E. *Élevages d'oiseaux aquatiques.* Bull. Soc. Acclim. 1884, pp. 318-320.

CRAWFORD, R. *Across the Pampas and the Andes.* London : 1884, 8vo, pp. i.-xxii. & 1-344, 8 pls., front., and map.

An account of a surveying journey, which includes notices of Birds. [See *Merganetta armata* (*Anatidæ*).]

CRONAU, C. *Die Fasanen. Pflege und Aufzucht.* Strassburg : 1884, 4to, pp. i.-iv. & 1-155, 4 pls.

CSATÓ, J. V. [See *Lanius homeyeri* (*Laniidæ*), *Phalaropus hyperboreus* (*Scolopacidæ*).]

- CSOKOR, J. Bericht über die der pathologisch-anatomischen Anstalt des k. k. Thierarznei-institutes in Wien während des Studienjahres 1881-82. MT. orn. Ver. Wien, 1884, pp. 11 & 12. Vergiftung mit phenylsaurem Kalk bei fünf Hühnern. *T. c.* p. 12.
- . Ueber den feineren Bau der Geflügelpocke (*Epithelioma contagiosum*, B.). *T. c.* pp. 13, 21-25, & 39-42.
- DABROWSKI, E. v. Die Vögel der Krajna. *T. c.* pp. 113-115 & 138-141.
An account of the Birds of N.E. Bosnia.
- . [See also *Mergus merganser* (*Anatidae*), *Syrnhaptes paradoxus* (*Pteroclidæ*).]
- DALBERG, F. v. Ornithologische Beobachtungen aus Mähren. *T. c.* pp. 184 & 185.
[See CAPEK, W.]
- DALGLEISH, J. J. Notes on a Second Collection of Birds and Eggs from Central Uruguay. P. Phys. Soc. Edinb. 1883-84, pp. 77 & 78. (15 species are included.)
- . [See also *Sterna regia* (*Laridæ*).]
- DALLA TORRE, A. v. Ornithologisches aus Tirol. MT. orn. Ver. Wien, 1884, pp. 170 & 171.
- DAMES, W. Ueber *Archæopteryx*. Palæont. Abhandl. ii. pp. 119-196, pl. and cuts. [Translation in Geol. Mag. Dec. 3, i., pp. 418-424, by E. C. Woodward.] Cf. SB. Ak. Berlin, 1882, p. 817, for a paper on the head of *Archæopteryx* [trans. in Geol. Mag. 1882, pp. 566-568], which is omitted from Zool. Rec. xix.
- DARESTE, C. Etudes expérimentales sur l'incubation, 2^e partie. Bull. Soc. Acclim. 1884, pp. 1-13. [Cf. *op. cit.* 1883, p. 137.]
- . Recherches sur l'incubation des œufs de poule dans l'air confiné et sur le rôle de la ventilation dans l'évolution embryonnaire. C.R. xcvi. pp. 924-926.
- DAVISON, J. L. [See *Oceanites oceanica* (*Procellariidæ*).]
- DELAURIER, M. Éducatons d'oiseaux exotiques faites à Angoulême. Bull. Soc. Acclim. 1884, pp. 212-218.
- DOULO, L. Note sur la présence du *Gastornis edwardsii*, Lemoine, dans l'assise inférieure de l'étage landenien à Mesoin, près Mons. Bull. Mus. Belg. ii. pp. 297-308, pl.
- DONOVAN, C. [See *Otis tetrax* (*Otididæ*).]
- OWLING, J. J. [See *Xema sabinii* (*Laridæ*).]
- DRESSER, H. E. [See *MEROPIDÆ*; and *Hypolais icterina* (*Sylviidæ*), *Otocorys brandti* (*Alaudidæ*).]
- DREW, F. M. [See *Lagopus leucurus* (*Tetraonidæ*).]
- DUBOIS, A. Die Vögel von Belgien. MT. orn. Ver. Wien, 1884, pp. 51, 52, 74, 75, 89-91, & 106-108.
A brief catalogue of 335 species.

[DUBOIS, A.]. [See also *Chalcopsittacus duivenbodei* (*Psittaci*), *Bucero-tida*, *Otocorys* (*Alaudidæ*).]

DUDLITZ, E. [See *Psittacus galeritus* (*Psittaci*).]

DUTCHER, W. Bird Notes from Long Island, N. Y. *Auk*, i. pp. 31-35 & 174-179.

DUVAL, M. De la formation du blastoderme dans l'œuf d'oiseau. *Ann. Sci. Nat.* (6) xviii. 1, 2, 3, pp. 1-208, 5 plates with 65 figures and numerous woodcuts in the text.

The writer thinks that the difference of opinion on this subject is due to the assumption that the development of the blastoderm is at every stage the same in all parts of the embryo, which he maintains is not the case; his object is to describe the changes that precede the appearance of the primitive streak. A description of this is followed by an analysis of Koller's investigations.

—. Études histologiques et morphologiques sur les annexes des embryons d'oiseaux. *J. Anat. Phys.* 1884, pp. 201-241, 4 pls.

—. Sur un organe placentaire chez l'embryon des oiseaux. *C.R.* xcvi. pp. 447-449.

DYBOWSKI, B., & TACZANOWSKI, L. Liste des oiseaux du Kamchatka et des îles Comandores. *Bull. Soc. Z. Fr.* 1884, pp. 145-161.

A list of 161 species obtained or seen by Dybowski during four years, with remarks on the most important, and corrections of former lists. [See *Archibuteo ferrugineus*, *A. candidissimus*, and *A. atricapillus* (*Falconidæ*), *Hirundo rustica* (its races) (*Hirundinidæ*), *Troglodytes dauricus*, sp. n., and *T. pallescens* (*Troglodytidæ*), *Turdus chrysolaus* (*Turdidæ*), *Otomela superciliosa* (*Laniidæ*), *Motacilla ocularis* (*Motacillidæ*), *Corvus corax kamtschaticus* (*Corvidæ*), *Loxia leucoptera* (*Fringillidæ*), *Gallinago uniclava* (*Scolopacidæ*).

FICALBI, E. Struttura delle sacche aerifere degli uccelli. *Atti Soc. Tosc.* p.-v. iv. p. 81.

FINSCH, O. Ueber Vögel der Südsee. *MT. orn. Ver. Wien*, 1884, pp. 54, 55, 75, 76, 92-95, 108-111, & 120-127. [Also separately, 8vo, 56 pp.]

The birds are divided into five heads—(1) New Britain, (2) New Guinea, (3) Cape York and Torres Straits, (4) New Zealand, and (5) Micronesia; they were for the most part seen or procured by the author. He says that about 112 species are known from New Britain, 42 from New Ireland, and 39 from the Duke of York group. [See *Corvus salgadoi*, sp. n. (*Corvidæ*).]

FISCHER, G. A. Übersicht der auf seiner im Auftrage der Hamburger geographischen Gesellschaft unternommenen Reise in das Massailand gesammelten und beobachteten Vogelarten. *Z. Ges. Orn.* 1884, pp. 297-396, pls. xix. & xx.

The plates are of *Parus fringillinus*, *Euplectes friedrichseni*, *Notauges fischeri*, and *Drepanorhynchus reichenowi*, spp. nn. [For other new species, see below.]

FISCHER, G. A., & REICHENOW, A. Neue Vogelarten aus dem Massailand (Inneres Ostafrika). J. f. O. 1884, pp. 52-58 & 178-182.

[See *Corythaix hartlaubi* (Musophagidæ), *Cotyle rufigula* (Hirundinidæ), *Dioptrornis* (g. n.) *fischeri*, *Alseonax murina*, *Chloropeta massaica* (Muscipidæ), *Notauges fischeri* (Sturnidæ), *Nigrita cabanisi*, *Euplectes friedrichseni* (Ploceidæ), *Passer rufocinctus*, *Coraphites leucopareia*, *Megalophonus massaicus* (Fringillidæ), *Zosterops curycricotus* (Meliphagidæ), *Nectarinia melanogastra*, *Drepanorhynchus reichenowi*, *Cinnyris falkensteini* (Nectariniidæ), *Burnesia melanocephala*, *Calamonastes fischeri*, *Tricholais occipitalis*, *Euprinodes golzi* (Timeliidæ), *Parus fringillinus* (Paridæ), *Tarsiger orientalis*, *Lusciola africana* (Sylviidæ), *Saxicola schalowi*, *Pseudocossyphus* (g. n.) *rufus* (Turdidæ), *Cursorius gracilis*, *Charadrius venustus* (Charadriidæ), *Francolinus altumi* (Phasianidæ), *Turtur perspicillata* (Columbæ), *Paeocephalus massaicus* (Psittaci), *Trachyphonus boehmi*, *Barbatula simplex* (Capitonidæ), *Picus rhodeogaster* (Picidæ), *Prionops poliocephus* (Laniidæ), spp. nn.]

[See also *Sycobrotus reichenowi* and *Calyphantria erythrogegens*, spp. nn. (Ploceidæ).]

—, Neue Vogelarten aus Ostafrika. T. c. pp. 260-263.

[See *Cisticola nana* and *Phyllostrephus parvus* (Timeliidæ), *Lanius affinis* (Laniidæ), *Xenocichla tenuirostris* (Pycnonotidæ), *Picus mombasicus* (Picidæ), *Francolinus leucopareus* (Phasianidæ), spp. nn.]

FOL, H. Sur le numéro d'ordre des premières provertèbres chez l'embryon de poulet. Arch. Sci. nat. xi. pp. 104 & 105.

FORBES, H. O. Remarks on a paper by Dr. A. B. Meyer on a Collection of Birds from the East Indian Archipelago, with special reference to those described by him from the Timor-Laut group of Islands. P. Z. S. 1884, pp. 425-434.

8 birds are described by Meyer, apparently not included in Selater's list of H. O. Forbes' collection from the same district; but they are merely differently named. A list of the species inhabiting the Tenimber Islands is added. [See RIEDEL, J. G. F., and SALVADORI, T.; also *Urospiza albiventris* (Falconidæ), *Saurapatis sancta* (Alcedinidæ), *Eurystomus pacificus* (Coraciidæ), *Geoffroyus timorlaoensis* (Psittaci), *Artamus musschenbroeki* (Artamidæ), *Pachycephala arctitorquis* (Laniidæ), *Ptilopus flavovirescens* (Columbæ), *Calornis circumscripta* (Sturnidæ), *Hirundo javanica* (Hirundinidæ), *Porphyrio melanopterus* (Rallidæ), *Geocichla achiki* (Turdidæ), *Philemon timorlaoensis* (Meliphagidæ), *Rhipidura* (Muscipidæ).] [See also *Myzomela wakoloensis* (Meliphagidæ).]

FORBES, W. A. [the late]. Final Idea as to the Classification of Birds. I. 1884, pp. 119 & 120.

From Forbes' Journal, dated only four days before his death.

FRITSCH, A. [See *Somateria mollissima* (Anatidæ).]

FROMANN, C. Über die Epidermis des Hühnchens in der letzten Woche der Bebrütung. Jen. Z. Nat. 1884, pp. 941-950.

GADEAU DE KERVILLE, H. De l'action de persil sur les Psittacides (nouvelles expériences et notes complémentaires). Rouen : 1884. 8vo, pp. 1-6. [Cf. Zool. Rec. xx. *Aves*, p. 7.]

— . [See also *Conurus solstitialis* (*Psittaci*).]

GADOW, H. Catalogue of the Passeriformes, or Perching Birds, in the Collection of the British Museum; *Cinnyrimorphæ*, containing the families *Nectariniidæ* and *Meliphagidæ* (Sun-Birds and Honey-Eaters) Vol. ix. of series. [See Zool. Rec. xx. *Aves*, p. 7.] London : 1884, 8vo, xii. & 310 pp., pls. i.-vii. [The subfamily *Zosteropinae* is entirely the work of R. B. SHARPE.]

The new species described are *Myzomela guentheri*, p. 129, pl. iii. (New Britain), and *Zosterops crissalis*, p. 165 (Astrolabe Mountains, S.E. New Guinea); as well as *Z. gallio*, p. 185 (Java), and *Z. fallax*, p. 197 (Sumatra and Java), which are redescribed, owing to the inadmissibility of the names formerly given. The following changes have been made from the genera used by Shelley (Mon. Nect.), Forbes (P. Z. S. 1879), Gould, and others:—

<i>Nectarinia</i>	for <i>Hedydipna</i> .	<i>Ptilotis</i>	for <i>Foulehaio</i> .
<i>Æthopyga</i>	„ <i>Urodrepanis</i> .	„	„ <i>Myzantha</i> (part).
„	„ <i>Eudrepanis</i> .	„	„ <i>Xanthotis</i> .
<i>Arachnothera</i>	„ <i>Arachnoraphis</i> (in 3 species).	„	„ <i>Lichenostomus</i> .
„	„ <i>Melilestes</i> (in 2 species).	„	„ <i>Stomioptera</i> .
<i>Anthothreptes</i>	„ <i>Anthreptes</i> .	<i>Meliornis</i>	„ <i>Meliphaga</i> (4 species).
„	„ <i>Anthodiata</i> (in 3 species).	<i>Manorhina</i>	„ <i>Myzantha</i> (part).
<i>Zosterops</i>	„ <i>Parinia</i> .	<i>Acanthochæra</i>	„ <i>Anthochæra</i> .
„	„ <i>Thamnobia</i> .	„	„ <i>Acanthogenys</i> .
„	„ <i>Heleia</i> .	<i>Philemon</i>	„ <i>Tropidorhynchus</i> .
<i>Glycyphila</i>	„ <i>Glycychæra</i> .	<i>Melitagrais</i>	„ <i>Tropidorhynchus</i> (1 species).
„	„ <i>Stigmatops</i> .	<i>Euthyrhynchus</i>	„ <i>Timeliopsis</i> .
<i>Entomophila</i>	„ <i>Conapophila</i> .	„	„ <i>Melipotes</i> .
„	„ <i>Certhionyx</i> .	„	„ <i>Plectorhyncha</i> .
<i>Meliphaga</i>	„ <i>Xanthomyza</i> .		

In the Appendix is a description of *Drepanorhynchus reichenowi* (the genus probably comes next to *Æthopyga*), *Zosterops euryerictus* (position of the species doubtful), *Ædistoma pygmaum* (the genus probably near *Glycyphila*). In footnotes we find *Ptilotis ixoides*, p. 222 (position of species uncertain), *Zosterops delicatula*, p. 177 (probably = *Z. frontalis*, Salvad.), *Z. ramsayi*, p. 158 (probably = *Z. westernensis*), *Z. fusca*, *Z. rufilata*, and *Z. obscura*, p. 146 (species not seen by the author), *Myzomela lafargei*, p. 135 (a doubtful species). [See also *Tropidorhynchus aruensis*, sp. n., *Stigmatops salvadorii*, and *S. kebirensis*, spp. nn.; A. B. Meyer, Z. Ges. Orn. 1884, pp. 217-219.]

— . [See also BRONN, H. G.]

GARDINER, E. G. Beiträge zur Kenntniss des Epitrichiums und der Bildung des Vogelschnabels. Arch. mikr. Anat. Bd. 24, pp. 289-338, 2 pls.

GATCOMBE, J. [See *Procellaria leucorrhœa* (*Procellariidæ*).]

GEBERG, A. Ueber die Nerven der Iris und des Ciliarkörpers bei Vögeln. Internat. Mon. f. anat. u. Histol. Band i. pp. 7-52, 3 pls.

GIGLIOLI, E. H. Iconografia dell' avifauna Italica, ovvero tavole illustranti le specie di uccelli che trovansi in Italia con brevi descrizioni e note. Prato (Toscana), pts. xxii.-xxiv. 1883, pts. xxv.-xxvii. 1884, folio, discontinuous pagination. [Cf. Zool. Rec. xx. *Aves*, p. 7.]

The species figured are *Merops persicus*, *Regulus cristatus*, *Parus ater*, *Accentor modularis*, *Melizophilus undatus*, *Picus minor*, *Turdus viscivorus*, *Phyllopneuste sibilatrix*, *Cannabina linota*, *Egretta alba*, *Troglodytes parvulus*, *Turdus merula*, *Saxicola albicollis*, *Fringilla cælebs*, *Ruticilla phaniscus*, *Falco subbuteo*, *Lynx torquilla*, *Erythacus rubecula*, *Daulias lusciniæ*, *Sylvia cinerea*, *Merula torquata*, *Budytes cinereocapillus*, *B. melanocephalus*, *Anthus arboreus*, *Carduelis elegans*, *Pallenura melanope*, *Budytes flavus*, *Ægialites curonica*, *Ardea cinerea*, and *Botaurus stellaris*.

GLANVILLE, M. Catalogue of the Natural History Collections of the Albany Museum, Graham's Town. Cape Town: 1883, 8vo.

Including S. African birds, pp. 15-52; other birds, pp. 151-155; British birds' eggs, pp. 156 & 157.

GODMAN, F. D., & SALVIN, O. Biologia Centrali-Americana; or, Contributions to the Knowledge of the Fauna and Flora of Mexico and Central America. Zoology; *Aves*, pt. xxviii. pp. 313-328, pls. xxii. & xxiii.: pt. xxxiv. pp. 329-344, pl. xxiv. [See Zool. Rec. xx. *Aves*, p. 14; where the pages are given as far as 224 instead of 312.]

The work is continued to the end of the *Tanagridæ* (through the genera *Chlorospingus*, *Buarremon*, *Arremon*, *Saltator*, and *Pitylus*), and thence into the *Fringillidæ* (through the genera *Pheucticus*, *Hedymeles*, *Cardinalis*, *Pyrruloxia*, and *Guiraca*, pt.). Plates are given of *Chlorospingus punctulatus* (pl. xxii. fig. 1), *C. pileatus* (pl. xxii. fig. 2), *C. hypophæus* (pl. xxii. fig. 3), *Buarremon capitalis* (pl. xxiii. fig. 1), *B. tibialis* (pl. xxiii. fig. 2), and *Pitylus celano* (pl. xxiv.). There are no new species, but the authors state that *Saltator atriceps*, Less., = *Tanagra gnatho*, Lich., = *Arremon giganteus*, Bp., = *Pyrrhula raptor*, Cabot (p. 326), and that *Saltator magnoides* = *S. gigantodes*, Calb. (p. 327). The genus *Buarremon* covers *Buarremon*, *Chrysopoga*, *Carenochrous*, and *B. ilopsis*.

10 —. Notes on Birds from British Guiana. III. Ibis, 1884, pp. 443-452, pls. xiii. & xiv. [Cf. Zool. Rec. xx. *Aves*, p. 14.]

18 new species and 1 new sex are described, collected by H. Whitely at Mt. Roraima. [See *Turdus roraimæ* (*Turdidæ*), *Chlorophonia roraimæ* and *Calliste whitelyi* (*Tanagridæ*), *Phonipara phaeoptila* (*Fringillidæ*), *Euscarthmus russatus*, *Leptopogon nigrifrons*, and *Elainia olivina* (*Tyran-*

nidæ), *Chloropipo uniformis*, *Pipra iracunda*, and *Lathria streptophora* (*Pipridæ*), *Pachyrhamphus griseigularis* (♂) and *Pipreola whitehyi* (*Cotingidæ*), *Synallaxis demissa*, *S. adusta*, and *Philydor albigularis* (*Dendrocolaptidæ*), *Thamnophilus insignis* and *Grallaria simplex* (*Formicariidæ*), *Petasophora germana* and *Amazilia cupreicauda* (*Trochilidæ*).]

GOETZ, C. [See *Tetrao tetrix* (*Tetraonidæ*).]

Goss, N. S. A Catalogue of the Birds of Kansas. Topeka, Kans.: 1883, 8vo, iv. & 34 pp.

The list contains 49 families, 320 species and races, of which 161 breed in the State. An appendix includes 29 species which should occur, and a note on *Passer domesticus*.

— Birds new to the Fauna of Kansas, and others rare in the State. *Auk*, i. p. 100.

— [See also *Phalacrocorax violaceus* and *P. v. resplendens* (*Pelecanidæ*), *Dytes nigricollis californicus* (*Podicipedidæ*), *Brachyrhamphus hypoleucus* (*Alcidæ*), *Lanivireo flavifrons* (*Vireonidæ*), *Zonotrichia gambeli intermedia* (*Fringillidæ*), *Corvus cryptoleucus* (*Corvidæ*).]

GOULD, J. [the late]. The Birds of New Guinea and the adjacent Papuan Islands, including any new species that may be discovered in Australia. Pts. xvi., xvii., & xviii. London: 1884. [Cf. *Zool. Rec.* xx. *Aves*, p. 7.]

The species (all figured) are *Gerygone dorsalis* (*Sylviidæ*), *Megalurus albolimbatus* (*Timeliidæ*), *Pachycephalopsis fortis* (*Laniidæ*), *Artamides unimodus* and *Grauculus pusillus* (*Campophagidæ*), *Rhipidura opistherythra*, *R. cockerelli*, *R. leucothorax*, *Pacilodryas bimaculata*, *Piezorhynchus castus*, *P. vidua*, *P. squamulatus*, *P. richardsii*, *P. brodiei*, *P. browni*, *Heteranax* (g. n.) *mundus*, *Pomarea ugiensis*, *P. rufocastanea*, *P. castaneiventris*, *Myiagra cervinicauda* and *M. ferrocyanea* (*Muscicapidæ*), *Oriolus decipiens* (*Oriolidæ*), *Philemon plumigenis*, *Myzomela erythrina*, *M. melanoccephala*, *M. wakoloensis*, *Zosterops longirostris*, *Z. fuscifrons*, and *Stigmatops albo-auricularis* (*Meliphagidæ*), *Dicaeum tristrami* and *D. aeneum* (*Dicaeidæ*), *Drepanornis cervinicauda* (*Paradisidæ*), *Halcyon leucopygia* (*Alcedinidæ*), *Eclectus riedeli* and *Charmosyna margarita* (*Psittaci*), *Ninox odiosa* (*Striges*), *Carpophaga finschi*, *Ptilopus richardsii* and *P. lewisi* (*Columbæ*).

— The Birds of Asia. Pts. xxxiv. & xxxv. [London: 1883], completing the work. [Cf. *Zool. Rec.* xix. *Aves*, p. 7.]

Figures are given of *Turdinulus roberti*, *Lioptila annectens*, and *Leiothrix laurina* (*Timeliidæ*), *Urocichla longicaudata* and *Anorthura formosa* (*Troglodytidæ*), *Irene puella* (*Dicruridæ*), *Dicaeum pryri* (*Dicaeidæ*), *Uragia sibiricus* (*Fringillidæ*), *Iyngipicus semicoronatus*, *I. canicapillus*, *I. hardwickii*, *I. auritus*, *I. fulvifasciatus*, *I. maculatus*, *I. gymnophthalmus*, *I. peninsularis*, and *I. nanus* (*Picidæ*), *Indicator xanthonotus* (*Indicatoridæ*), *Columba intermedia* (*Columbæ*), and *Argusianus argus* (*Phasianidæ*). [For the preface, see SHARPE, R. B.]

GREEN, J. R. The Edible Bird's Nest. *Nature*, xxxi. p. 126. [See PRYER, H.]

GREENE, W. T. [See *Psittaci*.]

KRÜGER, F. Die See-Vögel der Farallone-Inseln. Z. Ges. Orn. 1884, pp. 167-172.

An account of birds found at some islands 17 miles S.W. of San Francisco, Cal. [See *Lomvia californica* (*Alcidae*), *Larus occidentalis*, *L. californicus*, *L. heermanni* (*Laridae*).]

GURNEY, J. H. A List of the Diurnal Birds of Prey, with references and annotations; also a record of specimens preserved in the Norfolk and Norwich Museum. London: 1884, 8vo, pp. i.-xv. & 1-187.

The author's original intention was to publish an index to his criticisms on vol. i. (*Accipitres*) of the Brit. Mus. Cat., as contained in "The Ibis." He has enlarged his work by the addition of 15 appendices, footnotes, and other useful information. [See *Tinnunculus arthuri*, sp. n. (*Falconidae*).]

—. [See also AYRES, T.; *Hierofalco gyrfalco*, *Urospizias albiventris*, *Pernis apivorus*, *Aquila morphnoides*, *Gypsoictinia melanosternon*, *Tinnunculus pekinensis*, *Circaetus cinereus* (*Falconidae*), *Ninox* g., *Scops nicobaricus*, *Huhua nipalensis*, &c. (*Striges*).]

GURNEY, J. H., Jun. A Catalogue of the Birds of Norfolk. Reprinted from Mason's "History of Norfolk." London: 1884, 8vo, pp. 1-47. Notes on 285 species.

—. [See also *Cyanecula suecica* (*Sylviidae*), *Gallinula chloropus* (*Rallidae*), *Anthus cervinus* (*Motacillidae*).]

HAAST, J. v. [See *Phalaropus fulicarius* (*Scolopacidae*), *Megalapteryx hectori* (*Apterygidae*).]

HAMONVILLE, C. D'. De la mue des Rémiges chez le "canard sauvage" et des mœurs et habitudes de cet oiseau. Bull. Soc. Z. Fr. 1884, pp. 101-106.

An addition of the Mallard to the birds which lose all their wing quills at once, and are consequently unable to fly while moulting. (Cf. Gerbe, R. Z. xii. p. 33.) [See also TACZANOWSKI, L.]

HARGITT, E. Notes on Woodpeckers. No. vi. On the Genus *Miglyptes*. Ibis, 1884, pp. 189-199.

—. Ditto. No. vii. Additional notes on the Woodpeckers of the Ethiopian Region. T. c. pp. 199-202.

—. Ditto. No. viii. On the Genus *Hemicercus*. T. c. pp. 244-259.

The author characterizes 4 species and gives their synonymy in the first paper; gives a description of *Mesopicus spodocephalus*, with an emended key to the species, in the second; and characterizes 4 species in the third, with their synonymy, and a key to the species. [See *Mesopicus*, *Miglyptes* (*Picidae*).]

HARTING, J. E. [See *Attagen* (*Pteroclidæ*).]

HARTLAUB, G. [See *Salpornis emini*, sp. n. (*Certhiidae*), *Iynx pulchricollis*, sp. n. (*Picidae*).]

HARVIE-BROWN, J. A. On Uniformity in Recording the Occurrence of Birds. Ibis, 1884, pp. 349-352.

[HARVIE-BROWNE, J. A.] [See also *Ruticilla tithys* (*Sylviidae*), *Larus minutus* (*Laridae*); and BUCKLEY, T. E.]

HAWTAYNE, —. Taxidermic and other Notes. Georgetown, Demerara: 1884, 12mo, 62 pp.

HAZARD, R. G. [See *Protonotaria citrea* (*Mniotiltidae*).]

HEINE, F. [See *Pionias reichenowi* and *P. lacerus*, spp. nn. (*Psittaci*).]

HELM, F. Ueber die Hautmuskeln der Vögel, ihre Beziehungen zu der Federfluren und ihre Functionen. J. f. O. 1884, pp. 321-380, pl.

A description of the muscles, the method of investigation, and the nomenclature, with general remarks. A special description follows of the muscles of the Orders *Natatores*, *Grallatores*, *Rasores*, *Columbæ*, *Scansores*, *Passeres*, and *Raptatores*, with examples.

HENKE, K. G. Beitrag zur Lösung der Straussenfrage. Z. Ges. Orn. 1884, pp. 219-222.

On the question of the identity of the species of Ostrich, and on the differences of the various eggs, with figures of those of *Struthio molybdophanes* of Somali-land and *S. australis* of S. Africa.

—. Hahnenfederige Hennen. Dresden: 1884, 8vo.

HENSLAW, H. W. [See *Melospiza fasciata montana*, var. n. (*Fringillidae*), *Otocorys alpestris* (*Alaudidae*), *Larus nelsoni*, sp. n. (*Laridae*).]

HOLMBERG [Dr.]. Resultados científicos, especialmente zoológicos y botánicos, de los tres viajes llevados a cabo por el Dr. Holmberg, en 1881, 1882, y 1883, a la Sierra del Tandil. Act. Ac. Córdoba, tom. v. Ent. prim. Buenos Ayres: 1884.

Remarks on 79 species of Birds.

HOMER, E. F. v. Ueber den Jahresbericht (1882) des Comité's für ornithologische Beobachtungs-Stationen in Österreich und Ungarn. On the report of the committee for the observation of Birds in Austria and Hungary. Z. Ges. Orn. 1884, pp. 172-176 & 261-267.

—. Unsere Naturwissenschaftliche Namengebung. T. c. pp. 3-6.

The author discusses the confusion arising from the present nomenclature of Birds.

—. Einige Blicke auf das Erste Heft der Zeitschrift für die Gesamte Ornithologie. M.T. orn. Ver. Wien, 1884, pp. 83 & 84.

—. [See also *Saxicola cypriaca*, sp. n.? (*Turdidae*), *Lanius collurio* (*Laniidae*), *Loxia curvirostra* (*Fringillidae*).]

HOWLEY, J. P. [See *Bernicla canadensis* (*Anatidae*).]

HUET, M. [See *Cathetus lathamii* (*Megapodiidae*).]

JACCARD, A. Sur les Vertébrés fossiles découverts récemment dans l'Amérique du Nord. Bull. Soc. Neuchat. 1883-84, pp. 191-197.

The author discusses *Ichthyornis*, *Apatornis*, *Hesperornis*, and *Archwopteryx*.

JEFFRIES, J. A. [See *Phalacrocorax* (*Pelecanidae*).]

- MAVSTON, H. H. Reise eines Künstlers nach dem Congo-Flusse. *MT. orn. Ver.* Wien, 1884, pp. 130-135 & 146-149.
 [A continuation from the same periodical for 1883, p. 256.]
- [See also SHELLEY, G. E.]
- KADICH, H. v. Ornithologische Streifereien in den Oberösterreichischen Alpen (II.). *T. c.* pp. 25-30.
 [A continuation from the same periodical for 1883, p. 71.]
- Der Dorndreher in Freiheit und Gefangenschaft. *T. c.* pp. 152-154.
- Wanderskizzen aus Steiermark. *T. c.* pp. 177-183.
- KUTTER [DR.]. Bemerkungen über eine von F. Grabowsky aus S.O. Borneo eingesandte kleine collection von Vogeleiern (mit Benutzungshandschriftlicher Notizen des Sammlers). *J. f. O.* 1884, pp. 224-227.
 [See *Ardeola speciosa* (Ardeidae), *Gallinula frontata*, *G. orientalis*, *Ortygometra cinerea*, *Porphyrio indicus* (Rallidae), *Hydralector gallinaceus* (Pardidae), *Centrocyx javanensis* (Cuculidae), *Collocalia linchi* (Cypselidae).]
- LANDOIS, H. Ueber die Eingeweidewürmer in Hühnern und Eiern; Bildung der Eischale. *Verh. Ver. Rheinl.* 1884, p. 77.
 — Sind Eiweiss und Eischale bei Vogeleiern periplastische oder exoplastische Gebilde? *J. f. O.* 1884, pp. 182-184.
 The author maintains that the shell and the white of eggs are formed of periplast, as against Nathusius who considers them to be formed of exoplast.
- Notizen über die Entwicklung der Schale bei den Vogeleiern. *Tag. 57, Vers. deut. Nat. Magdeburg*, pp. 93 & 94.
- LATASTE, F. Sur l'alimentation des Rapaces nocturnes [*Striges*]. *Bull. Soc. Acclim.* 1884, pp. 854-856.
- LAWRENCE, G. N. [See *Contopus albicollis* (Tyrannidae), *Chatura yucatanica* (Cypselidae), *Larus leucopterus* (Laridae), and *Engyptila gaumeri*, *E. wellsi* (Columbæ), spp. nn.]
- LAYARD, E. L. The Birds of South Africa. New edition, thoroughly revised and augmented by R. BOWDLER SHARPE. Part vi., completing the work [cf. *Zool. Rec.* xix. *Aves*, p. 10]: *Alaudidae*—*Struthionidae*, pp. 529-890, pls. i. & iv.
 — [See also *Chrysococcyx lucidus* (Cuculidae), *Nestor productus* (Psittaci).]
- MOIN, J. M. Ornithology in Canada and in the United States. 'Quebec Morning Chronicle,' Aug. 23, 1884.
 A short compilation for the use of the members of the British Association.
- LUDWIG FERDINAND VON BAYERN [PRINCE]. Ueber Endorgane der sensiblen Nerven in der Zunge der Spechte. *SB. bayer. Ac.* 1884, pp. 183-192, 2 pls.
 The writer discusses the use of the Woodpecker's tongue in feeding.

[LUDWIG FERDINAND VON BAYERN (PRINCE).] *Zur Anatomie der Zäurus*
Munich: 1884, 4to (Birds, pp. 67-76, pls. xxiv.-xxxv.).

LYDEKKER, R. Indian Tertiary and Post-tertiary Vertebrata, Siwalik
Birds. Mem. Geol. Surv. Ind., ser. x. vol. iii. pt. 4, pp. 135-147.

The author states that, owing to various circumstances, the remains of
Birds are comparatively rare. Besides 3 species whose genera are uncertain,
he treats of *Pelecanus cautleyi* and *P. sivalensis*, *Phalacrocorax* sp.?,
Leptoptilus falconeri (*Ciconiidae*), *Mergus* sp.? (*Anatidae*), *Struthio asiaticus*
(*Struthionidae*), and *Dromæus* (?) *sivalensis* (*Casuariidae*). [Error corrected in Geol. Mag. (3) ii. p. 237, May, 1885.]

MACPIERSON, H. A. [See *Pastor roseus* (*Sturnidae*), *Hierofalco gyrfulco*
(*Falconidae*).]

MADARÁSZ, J. V. Die Singvögel Ungarns. Z. Ges. Orn. 1884,
pp. 112-156.

The author treats of 25 families, ranging from *Turdidae* to *Alcedinidae*
and *Caprimulgidae*. [See *Ruticilla cairii* (*Sylviidae*), *Fringilla albigularis*
(*Fringillidae*).]

—. Die Raubvögel Ungarns. T. c. pp. 243-260.

28 species of *Accipitres* are described, as well as 20 subspecies. These
two papers are portions of a work on the Birds of Hungary.

—. Zur Fauna Cachars. T. c. pp. 50-53.

[See *Stachyris nigriceps* (*Timeliidae*), *Siphia cachariensis* (*Muscicapidae*),
pl. i. fig. 2, *Dicaeum* sp.? (*Dicaeidae*), pl. i. fig. 3. Pl. i. fig. 1, is *Mixornis*
rubricapilla (*Timeliidae*).]

—. [See also *Parus palustris*, *P. fruticeti*, *P. kamtschatskensis* (pl.)
(*Paridae*); CABANIS, J., and PETENYL, S.]

MAGGIORANI, C. Influenza del magnetismo sulla embriogenesi e sterilità
degli uovi. Atti Ac. Rom. 1884, pp. 274-280.

MARCHAND, ARM. & ALB. Les Poussins des Oiseaux d'Europe, recueil
de 150 planches d'oiseaux en duvet. T. i. 176 pp. & pls. i.-lxxv.
Chartres: 1884, 8vo.

MARSHALL, A. Arten der Ornis Austriaco-Hungarica in Japan. MT.
orn. Ver. Wien, 1884, p. 77.

25 species common to Japan and Austro-Hungary are given, taken
from H. Seebohm's paper in *Ibis*, 1884, pp. 30-43.

—. Ausser-europäische Vorkommen von Arten der Ornis Austriaco-
Hungarica. T. c. pp. 185-188.

MARSHALL, C. H. T. Notes on the Birds of Chamba, in the N.W.
Himalayas. *Ibis*, 1884, pp. 404-425, pl. x.

An interesting paper on the occurrence and nesting of 263 species. [See
especially *Tursiger chrysaëus* (*Sylviidae*), *Ixulus flavicollis* (*Pycnonotidae*),
Lophophorus chambanus, sp. n. (*Phasianidae*), pl.]

MARTORELLI, G. Osservazioni sui Mammiferi ed Ucelli fatte in Sardegna.
Pistoia: 1884, fol. [Birds, pp. 11-54.]

Plates are given of *Falco punicus* (*Falconidae*), *Butalis grisola* (nest)
(*Muscicapidae*), and of the heads and feet of various groups.

MATHEW, M. A. On the Birds of Pembrokeshire. Zool. 1884, pp. 211-220.

MENZBIER, M. Rôle du croisement dans l'extinction des espèces. Rev. Sci. (3) No. 17, pp. 515-521, 1884.

The extinction of several species by cross-breeding is discussed.

—. Mémoires sur les *Paridae*. 1. Le groupe des Mésanges bleues (*Cyanistes*, Kaup.). Bull. Soc. Z. Fr. 1884, pp. 239-302.

A discussion of the variations of colour in the Blue Tits of the group *Cyanistes*, with an account of the different species and races, their synonymy and distribution. Special attention is paid to hybrids, cross-breeding being said to favour the extinction of existing species as well as the formation of new. [See *Cyanistes* (*Paridae*).]

—. On the Geographical Distribution of Birds in European Russia, north of the Caucasus. Part 1. Rapaces Diurnæ. Ibis, 1884, pp. 278-315.

[See *Falco peregrinus* vars., *F. leucogenys*, *Buteo vulpinus*, *B. vulgaris*, *Aquila chrysaetos* vars., *A. orientalis* vars., *A. pennata*, and *A. minuta* (*Falconidae*). 43 species are enumerated.]

MERRIAM, A. C. The Coues' Lexicon of North American Birds. Auk, i. pp. 36-49.

A criticism of the philology of the work.

MERRIAM, C. H. Of the Election of a Committee on the Migration of Birds by the American Ornithologists' Union. T. c. pp. 71-76.

The purposes of the committee are stated. [For further particulars, see t. c. pp. 207 & 208.]

—. Third Addendum to the Preliminary List of Birds ascertained to occur in the Adirondack Region, North-Eastern New York. T. c. pp. 58 & 59. [Cf. Bull. Nutt. Orn. Club, vi. pp. 225-235; vii. p. 128; vii. pp. 256 & 257.]

—. Second Addendum to List of Birds from Point de Monts, Quebec. Auk, i. p. 295.

—. [See also *Vireo philadelphicus* (*Vireonidae*), *Passerculus princeps* (*Fringillidae*), *Turdus aliciae bicknelli* (*Turdidae*).]

MEYER, A. B. Ueber neue und ungenügend bekannte Vögel, Nester und Eier aus dem Ostindischen Archipel im Königl. Zoologischen Museum zu Dresden. SB. Ges. Isis, 1884, pp. 3-64.

The author gives a list of 153 species, with diagnoses of those that are new, preceded by an introduction on the Birds of the various islands from which his specimens come. [See *Ninox scutulata*, an sp. n. ? (*Striges*), *Urospizias approximans* (V. H.) var. *halmaherae*, Meyer, var. n., and *Spilornis asturinus*, sp. n. (*Falconidae*), *Geoffroyus timorlaeensis*, sp. n., and *Trichoglossus meyeri*, Wald., var. *bonthuinensis*, Meyer, var. n. (*Psittaci*), *Merops ornatus*, Lath., and var. *sumbaensis*, var. n. (*Meropidae*), *Caprimulgus faberi*, sp. n. (*Caprimulgidae*), *Monarcha inornatus* (Garn) var. *kisserensis*, Meyer, var. n.?, *M. geelvinkianus*, sp. n., *M. fuscescens*,

sp. n., and *M. pileatus*, Salvad., an sp. n. ? (*buruensis*, Meyer) (*Muscicapidae*), *Pacilodryas minor*, sp. n., and *Gerygone fulvescens*, sp. n. (*Sylviidae*), *Graucalus lettiensis*, sp. n., *Lalage riedeli*, sp. n., *Lalage timoriensis* var. *celebensis*, Meyer, var. n. (*Campophagidae*), *Artamus muschenbroeki*, sp. n. (*Artamidae*), *Rhectes rubiensis*, sp. n., *Pachycephala kebirensis*, *P. riedeli* and *P. sharpii*, spp. nn. (*Laniidae*), *Dicaeum salvadorii*, sp. n. (*Dicaeidae*), *Philemon kisserensis* and *P. timorlaoensis*, spp. nn. (*Meliphagidae*), *Calornis circumscripta*, sp. n. (*Sturnidae*), *Ptilopus flavovirens* and *Carpophaga pinon* var. *rubiensis*, Meyer, var. n. (*Columbæ*).]

[MEYER, A. B.] Notizen über Vögel, Nester und Eier aus dem Ostindischen Archipel, speciell über die durch Herrn C. Ribbe von den Aru-Inseln jüngst erhaltenen. Z. Ges. Orn. 1884, pp. 269-296, pls. xiv.-xviii.

[See *Sauromarptis gaudichaudii* var. (*Alcedinidae*), *Rhectes analogus*, sp. n., pls. xiv. fig. 2, & xv. fig. 2, *R. rubiensis*, pls. xiv. fig. 1, & xv. fig. 1, *R. decipiens*, pl. xv. fig. 3 (*Laniidae*), *Xanthotis rubiensis*, sp. n. (*Meliphagidae*), *Paradisaea apoda* (*Paradisiidae*), *Eclectus roratus*, pull., pl. xvi. (*Psittaci*). Pls. xvii. & xviii. are eggs of various species, which are recorded under their several families.]

——. Über neue und ungenügend bekannte Vögel im Königl. Zoologischen Museum zu Dresden. T. c. pp. 193-219, pls. vii.-ix.

Remarks on 37 new and rare birds from Timor-Laut, New Guinea, Omka, Ceram, Java, Borneo, Aru, Bonin, India, North Peru, North Colombia, and Bolivia. [See *Sauropatis australasiae* var. *minor*, Meyer, var. n. (*Alcedinidae*), *Leptotodus tenuis*, g. & sp. nn., *Microlestes arfakianus*, g. & sp. nn. (*Muscicapidae*), *Gerygone bimaculata*, sp. n. (*Sylviidae*), *Graucalus timorlaoensis*, sp. n. (*Campophagidae*), *Corvus latiostris*, sp. n. (*Corvidae*), *Pachycephala affinis*, sp. n. (*Laniidae*), *Oxygogon stuebelii*, sp. n., *Lophornis* sp. ?, *Chlorostilbon stuebelii*, sp. n. (*Trochilidae*), *Cinnyris henkei*, sp. n. (*Nectariniidae*), *Myzomela* sp. ?, *Zosterops incerta*, *Tropidorhynchus aruensis*, *Stigmatops salvadorii* and *S. kebirensis*, spp. nn. (*Meliphagidae*), *Geocichla schistacea*, sp. n. (*Turdidae*), *Hypsipetes* sp. ?, *Pycnonotus analis* var. *alba* (*Pycnonotidae*), *Turdinus sepiarius* var. *minor*, Meyer, var. n. (*Timeliidae*), *Macropygia* sp., and *M. timorlaoensis*, sp. n. (*Columbæ*).]

——. Abbildungen von Vogel-Skeleten herausgegeben mit Unterstützung der Generaldirection der königl. sammlungen für Kunst und Wissenschaft in Dresden. Dresden : 1884, pts. vi. & vii. pp. 41-48, pls. li.-lxx. [Cf. Zool. Rec. xx. *Aves*, p. 10.]

The plates include *Tetrao medius* and *T. urogallus* (*Tetraonidae*), *Lomvia troile* (*Alcidae*), *Apteryx oweni* (*Apterygidae*), *Didunculus strigirostris* (*Didunculidae*), *Goura victoria*, *Goura coronata*, *Carpophaga aenea*, *Columba tabellaria*, *Columba tympanizans*, *Columba brevicauda* (*Columbæ*), *Alcedo ispioides* (*Alcedinidae*), *Clytolaema rubinea* and *Phaethornis superciliosus* (*Trochilidae*), *Androglossa auripalliata*, *Psittacus erithacus*, *Aprosmictus dorsalis*, *Prioniturus platurus*, *Lorius cyanauchen*, *Lorius lory*, and *Trichoglossus ornatus* (*Psittaci*).

——. [See also *Tetrao intermedius* (*Tetraonidae*).]

- MILNE-EDWARDS, A. Abhandlung über die Fauna der Antaretischen Region. Chap. v., *Procellariidæ*. MT. orn. Ver. Wien, 1884, p. 43.
[Cf. Zool. Rec. xx. *Aves*, p. 10, where "südlichen" should be "Antarctischen" for all the references except the first.]
- MOJSISOVICS, A. v. [See *Archibuteo lagopus* (*Falconidæ*).]
- MORDEN, J. A., & SAUNDERS, W. E. List of the Birds of Western Ontario. Canad. Sports. Nat. ii. Nos. 11 & 12, pp. 183-187 & 192-194.
- MORE, A. G. [See *Falco candicans* (*Falconidæ*).]
- MOSELEY, H. N. On the Structure and Arrangement of the Feathers in the Dodo. Rep. Brit. Ass. 1884, p. 782.
- MURRAY, J. A. The Vertebrate Zoology of Sind. A systematic account, with descriptions of all the known species of Mammals, Birds, and Reptiles inhabiting the province; observations on their habits, &c.; tables of their geographical distribution in Persia, Beloochistan, and Afghanistan, Punjab, North-West Provinces, and the peninsula of India generally; with woodcuts, lithographs, and coloured illustrations. London & Bombay: 1884, 8vo (*Aves*, pp. 62-332).
[See *Serinus pectoralis*, sp. n. (*Fringillidæ*).]
- NATHUSIUS-KÖNIGSBORN, —, Ueber die feinere Structur der sogenannten Ueberzüge gewisser Vögeleier (namentlich von *Crotophaga*, *Pelecanus*, *Carbo*, und *Sula*), so wie deren Beziehung zu den oberhäutchen anderer Eischalen. Tag. 57 Vers. deut. Nat. Magdeburg, pp. 89-93.
- NEHRKORN, A. Ueber die jetzigen Kenntnisse der Fortpflanzung des Kuckuks. J. f. O. 1884, p. 198.
On the eggs of Cuckoos and their foster-parents.
- . Ueber die Wichtigkeit der Oologie für die Systematik. T. c. pp. 198 & 199.
- . [See also *Diphyllodes wilsoni* (*Paradisæidæ*), *Psittacula diophthal-mica* (*Psittaci*).]
- NELSON, E. W. [See *Picoides tridactylus alascensis*, subsp. n. (*Picidæ*), *Astur atricapillus henshawi*, subsp. n. (*Falconidæ*), *Actodromas maculata* (*Scolopacidæ*).]
- NELSON, T. H. [See *Ciconia alba* (*Ciconiidæ*), *Puffinus griseus* (*Procellariidæ*).]

EWTON, A. Ornithology. Encycl. Brit. 9th ed. xviii. pp. 1-50.

The history of the science is fully told to the end of the 18th century (pp. 1-10), after which the great number of publications renders it impossible to treat of more than some branches of the subject. First the illustrated works are dealt with (pp. 11-14), then the "Quinary System," which is considered to have greatly retarded progress for a quarter of a century (1825-50) in Britain, is described (pp. 15 & 16), and after that the principal faunistic works of countries "which form the

home of English people, or are commonly visited by them," are briefly reviewed (pp. 16-18). To this succeeds a history of modern views and classification, which are originally traced to Nitzsch and Merrem, and the various modifications of their primary sketches by themselves and others—as De Blainville, L'Herminier, Gloger, Sundevall, Blyth, Brandt, MacGillivray, Johannes Müller, Cabanis, Bonaparte, Cornay, and Blanchard—down to the introduction of the principle of Evolution, are discussed in considerable detail (pp. 18-32). Then follows a similar treatise on the post-Darwinian investigations of Parker, Huxley, Milne-Edwards, and Sclater (pp. 33-42). The importance of the discovery of *Archæopteryx*, as pointed out by Owen, and of Marsh's *Odontornithes*, is next dwelt on (pp. 42 & 43); but this group is shown to present types of the two great existing sub-classes *Ratitæ* and *Carinata*, and the latter is believed to have been evolved from the former. The taxonomy of *Carinata* is then treated at some length (pp. 45-49), and a general agreement with Huxley's scheme [*cf.* Zool. Rec. iv. pp. 46-49] as further developed by Sclater [*cf.* Zool. Rec. xvii. *Aves*, pp. 23-25] expressed; but the present knowledge of the subject is declared to be too imperfect to enable a phylogeny of even the *Carinata* to be yet composed. The immense service of the researches of Garrod and W. A. Forbes in subdividing the *Passeres* is fully recognized, as well as the limits assigned by them to the three Sub-orders, *Oligomyodi*, *Tracheophonæ*, and *Acromyodi*, or true *Oscines*. In these last the author disputes the generally-admitted primacy of the *Turdidæ* (pp. 47 & 48), showing it to have arisen from a misconception, and strongly urges the claims of the *Corvidæ* to that position (p. 49), as formerly insisted on by MacGillivray and Parker, and seeming now "to stand a fact on the firm ground of proof." An index to the authors' names cited concludes the article.

NICHOLSON, F. [See *Anthus pallescens* (*Motacillidæ*).]

OLPHE-GALLIARD, L. Contributions à la Faune Ornithologique de l'Europe occidentale. Pt. i. Bayonne: 1884, 8vo, xxviii. & 116 pp.

The writer proposes a somewhat new classification, beginning with *Saururæ* (*Archæopteryx*), *Ptilopteri* (*Spheniscidæ*), and *Anseres*, as nearest to the Fishes, and ending with *Struthionæ*, as nearest to the Mammals, thereby almost inverting the arrangement of C. L. Brehm. Pt. i. contains *Anseres brevipedes* (*Alcidæ*, *Colymbidæ*, *Podicipedidæ*).

OUSTALET, E. Les Anhingas ou oiseaux-serpents. La Nature, 1884, 2^e Semestre, pp. 8-11.

—. Les Pélicans. *T. c.* pp. 278-282.

In these two papers the author gives an account of the genera *Anhingia* and *Pelicanus*, and their habits, chiefly with reference to specimens in the Jardin des Plantes, Paris.

—. [See also *Campophaga petiti* and *C. cærulea* (*Campophagidæ*), *Ixonotus landanæ* (*Pycnonotidæ*), spp. nn.]

OWEN, R. [See *Dinornis elephantopus* (*Dinornithidæ*).]

PARK, A. F. [See *Larus humlieni* (*Laridæ*).]

PAULOW, A. Notes sur l'Histoire Géologique des oiseaux Bull. Mosc. 1884, pp. 100-124.

The author's chief text is *Archæopteryx*; he approves of dividing *Aves* into I. *Saurornithes*, II. *Ratitæ*, III. *Carinatae*; placing *Odontolæ* among the *Ratitæ* and *Odontormæ* among the *Carinatae*.

PELZELN, A. V. [See RADDE, G.]

PETÉNYI, S. Ueber die Entenarten Ungarns. Z. Ges. Orn. 1884, pp. 26-46.

A catalogue of the Hungarian *Anatidæ*, prepared from the notes of the late Salamon Petényi by J. v. Madarász. 31 species.

PETIT, L. [See *Hirundo poucheti*, sp. n. [sic], and *Psolidoprocne petiti* (*Hirundinidæ*).]

PHILLIPS, E. C. Ueber die Abstammung der Haushuhnes. MT. orn. Ver. Wien, 1884, pp. 52, 53, 76, & 77.

This paper was read at the Ornithological Congress in Vienna; translation in Zool. 1884, pp. 327-332.

PLEYDELL, J. C. MANSEL. [See *Circus cyaneus* (*Falconidæ*).]

POTTS, T. H. Oology of New Zealand. N. Z. J. Sci. 1884, pp. 222-226 & 274-287.

Containing information about 32 species and their nests and eggs.

——. Ueber Vererbung und Aenderung der Lebensweise. MT. orn. Ver. Wien, 1884, pp. 35-37.

——. Ornithologische Notizen aus Neu-Seeland. T. c. pp. 168-170.

[See *Nestor notabilis* (*Psittaci*), *Larus dominicanus* (*Laridæ*).]

——. [See also *Rhipidura flabellifera* and *R. fuliginosa* (*Muscicapidæ*), *Heteralocha acutirostris* (*Sturnidæ*).]

PRENTIS, W. [See *Anthus cervinus* (*Motacillidæ*), *Ciconia nigra* (*Ciconiidæ*).]

PRENTISS, D. W. [See COUES, E.]

PRYER, H. An Account of a Visit to the Birds'-nest Caves of British North Borneo. P. Z. S. 1884, pp. 532-538.

The author says that the material from which the birds make their nests is a fungoid growth. He refers to the edible nest of *Collocalia fuciphaga*, which, on analysis by J. R. Green, proves to be composed of mucin. The alga mentioned was a *Gleocapsa*.

PRZEWALSKI, N. On the Birds of Northern Tibet. Ibis, 1884, pp. 242-244.

A translation of a paper in Petermann's "Mittheilungen," Heft i. 1884. Przewalski met with 51 species, of which 19 are residents.

——. Reisen in Tibet und am oberen Lauf des Gelben Flusses in den Jahren 1879 bis 1880. Aus dem Russischen frei in das Deutsche übertragen und mit Anmerkungen versehen von Stein-Nordheim. Jena: 1884, 8vo, 282 pp.

Besides the account of the ornithology of Northern Tibet in the fore-

going article, several new species are mentioned in this work, and there is much additional information. [See *Rhopophilus deserti*, sp. n. (*Troglodytidae*), *Sitta eckloni*, sp. n. (*Sittidae*), *Pyrgilauda kansuensis*, sp. n. (*Alaudidae*), *Anser indicus* (*Anatidae*), *Phasianus satscheunensis*, *P. tarimensis*, *P. strauchi*, and *P. vlangali*, spp. nn., *Crossoptilon auroreum*, *C. mantschuricum*, *C. tibetanum*, and *C. drouyni* (*Phasianidae*).]

RADDE, G. Ornithologiae Caucasicae; die Vogelwelt des Kaukasus systematisch und biologisch-geographisch beschrieben. Kassel: 1884, 8vo, pp. i.-xi. & 1-592, pls. i.-xxvi. and a map.

The author acknowledges 369 species and 66 varieties, including *Porphyrio veterum* (*Rallidae*) [which should be *P. poliocephalus*] and *Tetrao mlokosivici* (*Tetraonidae*). He also gives an appendix on the line of flight of Birds, and another with the dates of occurrence.

—. Ueber eine Sendung von Vögeln aus dem Kaukasus. MT. orn. Ver. Wien, 1884, pp. 1-5.

A list of 50 species, with notes on them, and an introduction by A. v. Pelzel.

RAMSAY, E. P. [See *Rhipidura fallax* (*Muscicapidae*).]

RAVERET-WATTEL, —. Fermes à Antraches au Cap. Bull. Soc. Acclim. 1884, pp. 997 & 998.

REICHENOW, A. Die Vögel der Zoologischen Garten. Leitfaden zum Studium der Ornithologie mit besonderer Berücksichtigung der in Gefangenschaft gehaltenen Vögel. Ein handbuch für Vogelwirthe. Pt. ii. Leipzig: 1884, 8vo, pp. xix. & 456. [Cf. Zool. Rec. xix. *Aves*, p. 15.]

100 families and 651 genera are characterized.

— & SCHALOW, H. Compendium der neu beschriebenen Gattungen und Arten. J. f. O. 1884, pp. 381-436.

[Cf. Zool. Rec. xx. *Aves*, p. 13.]

—. [See also FISCHER, G. A., and *Bradyornis boehmi*, sp. n. (*Dicruridae*).]

REISCHKE, A. Klein-Barrier-Eiland (Hauturu) im Hauraki-Golf, Nordinsel von Neu-Seeland. MT. orn. Ver. Wien, 1884, pp. 81-83.
An account of the Birds of Hauturu.

REISER, O. [See *Tichodroma muraria* (*Certhiidae*).]

RIDGWAY, R. On a Collection of Birds made by Messrs. J. E. Bendict & W. Nye, of the United States Fish Commission steamer 'Albatross.' P. U. S. Nat. Mus. vii. No. 11, pp. 172-180.

—. [See *Mimus gilvus rostratus*, subsp. n. (*Turdidae*), *Psaltiriparus minimus californicus*, subsp. n., *P. grinda*, and *Parus atriceps turneri*, subsp. n. (*Paridae*), *Dendroica kirtlandi* and *D. rufopileata*, sp. n. (*Mniotiltidae*), *Vireosylva grandior* and *Vireo approximans*, spp. nn. (*Vireonidae*), *Muscicapa fulvifrons*, *Mitrephorus pallescens*, and *Empi-*

donax rubicundus (*Muscicapidae*), *Certhiola tricolor*, sp. n. (*Cerebidae*), *Spizella wortheni*, sp. n., and *S. pinetorum*, *Passerculus beldingi*, sp. n., and *P. princeps*, *Chrysomitris atriceps*, *Ammodromus pelenicus*, *Passerculus sandvicensis bryanti*, subsp. n., *Plectrophenax hyperboreus*, sp. n., *Carpodacus hæmorrhous*, *Loxia curvirostra bendirii*, subsp. n. (*Fringillidae*), *Icterus curasoensis*, sp. n. (*Icteridae*), *Elainea cinerescens*, sp. n., *Myiarchus mexicanus magister* and *M. lawrencii olivaceus*, subsp. nn. (*Tyrannidae*), *Carpodectes antoniae*, sp. n. (*Cotingidae*), *Colaptes mexicanus saturator*, subsp. n. (*Picidae*), *Selasphorus torridus* (*Trochilidae*), *Ceryle superciliosa strictoptera*, subsp. n. (*Alcedinidae*), *Buteo lineatus alleni*, subsp. n., *B. cooperi*, *Astur atricapillus striatulus* (*Falconidae*), *Phalacrocorax violaceus*, *P. v. resplendens*, *P. dilophus albociliatus* (*Pelecanidae*), *Eudocimus ruber* and *E. albus* (*Plataleidae*), *Anser albatus*, *Melanetta fusca* (*Anatidae*), *Zenaidura yucatensis*, *Z. ruficauda* (or *vinaceo-rufa*, sp. n.) (*Columbae*), *Lophortyx californicus brunnescens*, *Pediæcetes phasianellus campestris*, subsp. nn. (*Phasianidae*), *Fulica caribæa*, sp. n. (*Rallidae*), *Calodromas* = *Calopezus*, g. n. (*Tinamidae*).

[RIDGWAY, R.] [See also BAIRD, S. F.]

RIEDEL, J. G. F. A Letter stating that H. O. Forbes is incorrect in certain points in his remarks on Birds from Timor-Laut. P. Z. S. 1884, pp. 530 & 531. [See FORBES, H. O.]

RIESENTHAL, O. v. Die Kennzeichen unserer Raubvögel, nebst kurzer Anleitung zu Jagd und Fang. Charlottenburg: 1884, 8vo, 2 Ed., 48 pp.

ROBSON, C. H. [See *Charadrius fulvus* (*Charadriidae*).]

ROCHEBRUNE, A. T. DE. Faune de la Sènégalie. Act. Soc. L. Bord. viii. pp. 85-459. [Also separately, Paris, 1884, 8vo, pp. 1-370 & 1-6, *Aves*.]

A long paper, containing 686 species, with diagnoses of the rarer kinds, native names, &c. Several species originally described by the author are redescribed, and 30 plates are given of birds, nests, and eggs. [See *Terpsiphone senegalensis* (*Muscicapidae*), *Cotyle ambrosiaca* (*Hirundinidae*), *Quelea occidentalis*, *Spermospiza hæmatina* (*Ploceidae*), *Cryptorhina afra* (*Corvidæ*), *Psittacus rubrovarius* (*Psittaci*), *Nisaetus spilogaster*, *Spizaetus coronatus* (*Falconidae*), *Phasidus niger* (*Phasianidae*), *Houbara undulata* (*Otididae*). Cf. F. E. BEDDARD; *Ibis*, 1885, pp. 19-23.]

RODIGAS, E. [See *Balearica regulorum* (*Gruidae*).]

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

ROGERON, G. Croisements de Canards. Bull. Soc. Acclim. 1884, pp. 861-868.

RUSS, K. Die fremdlandischen Stübenvögel, ihre Naturgeschichte, Pflege und Zucht. Vol. iv. pts. 4 & 5, pp. 321-544. Magdeburg: 1884, 8vo.

— —. Die Webervögel und Widafinken, ihre Naturgeschichte, Pflege und Zucht. (Mit 13 Holz.) Magdeburg: 1884, 8vo, xiii. & 216 pp.

SAGE, J. H. [See *Helminthophaga leucobronchialis* (*Mniotiltidae*).]

SALVADORI, T. Ucelli dello Scioa e della regione fra Zeila e lo Scioa. Ann. Mus. Genov. 1884, pp. 7-276. [Also separately, Genova, 1884, 8vo, pp. 1-268.]

An important paper on the birds collected by O. Antinori in Shoa (307 species), followed by two appendices, (i.) of 25 birds noticed by Harris, Rüppell, &c., in Shoa; (ii.) of 74 by Antinori between Zeila and Shoa. [See *Hypotriorchis cuvieri* (Falconidæ), *Caprimulgus frenatus*, sp. n. (Caprimulgidæ), *Psolidoprocne antinorii*, sp. n. (Hirundinidæ), *Platystira albifrons* (Muscicapidæ), *Lanius antinorii* (Laniidæ), *Nectarinia subfamosa* (Nectariniidæ), *Sorella emini* (Fringillidæ), *Cryptospiza* (g. n.) *reichenowi*, *Euplectes scioanus*, sp. n., *Textor scioanus*, sp. n., *Hypphantornis meloxit*, sp. n. ? (Ploceidæ), *Otis cristata* and *O. canicollis* (Otididæ), *Stephanibyz coronata* (Charadriidæ), *Plectropterus scioanus*, *Querquedula capensis*, *Fuligula brunnea*, *Erismatura maccoa* (Anatidæ), *Podiceps infuscatus*, sp. n. (Podicipedidæ).]

— Remarks on the Eighth and Ninth Volumes of the Catalogue of the Birds in the British Museum. *Ibis*, 1884, pp. 322-329.

Important criticisms on the arrangement and on the identification of species. [See especially *Cyrtostomus melanocephalus* (Nectariniidæ), *Myzomela guentheri*, *M. infusca*, and *Stigmatops blasii* (Meliphagidæ).]

— Remarks on "Pt. vii. of Ramsay's Contrib. Zool. New Guinea," "Schlater on Tenimber Is.," "Meyer's Neue und ungen. bek. Vög." [SB. Ges. Isis], and "Finsch's Vögel der Südsee." *T. c.* pp. 353-356.

— Elenco degli Scritti di Tommaso Salvadori. 1863-84.

A list of the author's writings, about 150 in number.

— Notes on some Birds from Timor-Laut. *P. Z. S.* 1884, pp. 577-580.

[Cf. H. O. Forbes, *t. c.* pp. 425-434.] [See *Corvus latirostris* (Corvidæ), *Pitta vigorsi* (Pittidæ).]

— [See also *Merula dactyloptera* (Turdidæ), *Urospezias albiventris*, *Falco punicus* (Falconidæ), *Anas capensis* (Anatidæ), *Goura scheepmakeri* (Columbæ).]

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

SAUNDERS, H. Notes on the Birds of the Pyrenees. *Ibis*, 1884, pp. 365-392.

— On the Geographical Distribution of the *Laridæ*, with special reference to Canadian species. *Rep. Brit. Ass.* 1884, pp. 771 & 772.

— A History of British Birds by the late William Yarrell. 4th edition. Pts. xxi.-xxvi. pp. 457-684 & 1-240. London: 1884, 8vo. [Cf. *Zool. Rec.* xx. *Aves*, p. 14.]

These parts conclude *Scolopacidæ*, and treat of *Laridæ*, *Procellariidæ*, *Oceanitidæ*, *Alcidæ*, *Colymbidæ*, *Podicipedidæ*, *Pelecanidæ*, *Ardeidæ*, *Ciconiidæ*, *Ibididæ*, and part of *Platalaidæ*. The new species inserted are *Larus ichthyaetus* and *Puffinus griseus* (with a plate of the former). Doubtfully British are *Larus melanocephalus* and *Daption capense*, while *Larus atricilla* is cancelled [*Laridæ* and *Procellariidæ*].

SAUNDERS, W. E. [See MORDEN, J. A.]

- SCHALOW, H. Die Reisen Dr. Richard Böhm's im centralen Ostafrika. Vortrag gehalten am 10 März 1884, im ornithologischen Verein zu Stettin. Z. f. Orn. und prac. Gefl. iii. (viii.) Jahrg. Nr. 4-9.
- . Dr. G. A. Fischer's Forschungen in Ostafrika. [A Notice of G. A. Fischer's Discoveries in East Africa.] MT. orn Ver. Wien, 1884, pp. 14 & 15.
- . [See also *Lanius cristatus* and *L. borealis* (*Laniidae*), *Musophaga boehmi*, sp. n. (*Musophagidae*), *Numida coronata marungensis*, subsp. n. (*Phasianidae*), and REICHENOW, A.]
- SCHIAVUZZI, B. Sulla comparsa die specie nordiche nella regione Adriatica settentrionale. Z. Ges. Orn. 1884, pp. 93-103.
- A list of 28 northern species which have occurred in the N. Adriatic.
- . Die Entenjagd bei Monfalcone. T. c. pp. 46-48.
- A description of the method of Duck-hunting near Trieste.
- . [See also *Alca torda* (*Alcidae*), *Anas boschas* (*Anatidae*).]
- SCHMITT, G. Nouveau manuel complet de l'éleveur d'oiseaux, ou art de l'oiselier, contenant la description des oiseaux indigènes et exotiques, &c. Paris: 1884, 8vo.
- SCHULMAN, H. Ornitologiska iakttagelser under en resa i Östra Karelen sommaren 1880. Medd. Soc. Fenn. Hft. 9, pp. 1-38.
- SCLATER, P. L. A Review of the Species of the Family *Icteridae*. Part iii., *Agelaiinae* (13 genera), Ibis, 1884, pp. 1-27, pl. i.; Part iv., *Quiscalinae* (8 genera), pp. 149-167, pl. v. [Concluding the work.]
- The conclusion of a monograph of the family [cf. Part i., *Cassicinae*, op. cit. 1883, p. 145; Part ii. *Icterinae*, t. c. p. 352]. A plate of *Agelaius cyanopus* is given in Part iii., and of *Quiscalus tenuirostris* in Part iv., while some uncertain species are specially mentioned in conclusion.
- . [See also *Idiophsar brachyurus* (*Icteridae*), *Acanthidops buirdi* (*Fringillidae*), *Saxicola leucura* (*Turdidae*).]
- SCOTT, [LORD] H. [See *Phanicopterus antiquorum* (*Phanicopteridae*).]
- SCOTT, W. L. The Winter *Passeres* and *Picariae* of Ottawa. Auk, i. pp. 156-161.
- SEEBÖHM, H. A History of British Birds, with coloured Illustrations of their Eggs. London: 1884, 8vo, pt. iv. pp. 289-600 (concluding vol. ii.), pls. xxxii.-xxxv. & xxxix.-xlv. [Cf. Zool. Rec. xx. *Aves*, p. 15.]
- This part includes *Cypselidae*, *Caprimulgidae*, *Meropidae*, *Coraciidae*, *Upupidae*, *Alcedinidae*, *Picidae*, *Cuculidae*, *Columbidae*, *Pteroclididae*, *Tetranididae*, *Phasianidae*, *Ardeidae*, *Plataleidae*, *Ibididae*, *Ciconiidae*, *Rallidae*, *Gruidae*, *Otididae*, and *Ælidenidae*.
- . Further Contributions to the Ornithology of Japan. Ibis, 1884, pp. 30-43 & 174-183, pl. vi.
- 118 species are given. [See *Megalurus pryori*, sp. n. (*Timeliidae*), *Sterna sinensis*, *Stercorarius pomatorhinus* (*Laridae*), *Scolopax grisea* 1884. [VOL. XXI.]

(*Scolopacidae*), *Ardeola prasinoscels* (*Ardeidae*), *Lanius magnirostris* and *L. major* (*Laniidae*), *Merula chrysolaus* and *Merula cardis* (*Turdidae*), *Bubo blakistoni* (*Striges*), pl., *Bernicla nigricans* (*Anatidae*), *Diomedea nigripes* (*Procellariidae*), *Gallix cristata* (*Rallidae*), *Iyngipicus seebohmi* (*Picidae*), *Xanthopygia cyanomelena* and *Butalis sibirica* (*Muscicapidae*), *Motacilla amurensis* and *M. blakistoni* (*Motacillidae*), *Chelidon dusypus* (*Hirundinidae*).]

[SEEBOHM, H.] On a Collection of Birds from Central China. *T. c.* pp. 259-270.

Notes on birds collected mainly at Kiukiang, and on the Lushan Mts. (121 species). [See *Heterura sylvana* (*Motacillidae*), *Pomatorhinus styani*, sp. n. (*Timeliidae*), *Nettapus coromandelianus* (*Anatidae*)]

—. Notes on a Collection of Birds from Lankoran. *T. c.* pp. 425-429.

A paper on Persian Birds, containing 3 additions to the lists. [See *Hypolais icterina* (*Sylviidae*), *Ardea comata* (*Ardeidae*), *Erismatura leucocephala* (*Anatidae*).]

—. [See also *Troglodytes hirtensis*, sp. n. (*Troglodytidae*), *Otocorys longirostris* (*Alaudidae*), *Tetrao griseiventris* (*Tetraonidae*), *Falco sparverius* (*Falconidae*).]

SELYS-LONGCHAMPS, E. DE. Considérations sur le genre *Mésange* (*Parus*). Bull. Soc. Z. Fr. 1884, pp. 32-78.

The author gives a division into subgenera by a somewhat new method of characteristics, and adds a synopsis. He discusses the position of *Parus* amongst the *Passeres*, and the views of authors, and proceeds to reduce Gadow's 49 species to 38. There follows a dissertation on local races and their importance.

SENNETT, G. B. [See *Tyrannus melancholicus couchi* (*Tyrannidae*), *Synthliborhamphus antiquus* (*Alcidae*).]

SETON, E. E. T. [See *Oporornis agilis* (*Mniotiltidae*).]

SHARPE, R. B. Report on the Zoological Collections made in the Indo-Pacific Ocean during the Voyage of H.M.S. 'Alert,' 1881-1882. London: 1884, 8vo [Birds, pp. 11-28 & 483-485].

A list of the birds collected in (i.) Melanesia [Islands of Torres Straits; Port Moller and Port Curtis, Queensland; Port Darwin, N.W. Aust.]; (ii.) the Western Indian Ocean. [See *Ninox peninsularis* (*Striges*), *Lalage leucomelena* (*Campophagidae*), *Piezorhynchus medius*, sp. n. (*Muscicapidae*), *Pachycephala melanura* (*Laniidae*), *Myzomela obscura*, *Stigmatops subocularis* and *Ptilotis notata* (*Meliphagidae*), *Dacelo leachii*, &c. (*Alcedinidae*); *Megapodius duperreyi* (*Megapodiidae*), *Turtur coppingeri*, sp. n. (*Columbidae*).]

—. On a Collection of Birds made in Southern Palawan by Mr. E. Lemprière. *Ibis*, 1884, pp. 316-322, pl. viii.

See *Thriponax hargitti*, sp. n. (*Picidae*), pl., *Siphia lemprieri* and *Zecephus cyanescens* (*Muscicapidae*). In all, 31 species are enumerated.

[SHARPE, R. B.] Introduction to Gould's 'Birds of Asia.' Reprinted, Ibis, 1884, pp. 49-60.

— Contributions to the Ornithology of New Guinea. Part ix. On further collections made by Mr. A. Goldie in the Astrolabe Mts. [See *Erythrotriorchis doriae* (Falconidae), *Ninox theomacha* (Striges), *Amblyornis subalaris*, sp. n. (Paradisidae).] J. L. S. xvii. pp. 405-408.

— Notes on a Collection of Birds made by Herr F. Bohndorff in the Bahr-el-Ghazal Province and the Nyam-nyam country in Equatorial Africa. T. c. pp. 419-441.

See *Crateropus bohndorffi*, sp. n. (Timeliidae), *Sigmodus mentalis*, sp. n. (Laniidae), *Bradyornis diabolicus* (Dicruridae), *Cinnyris acik* (Nectariniidae), *Campothera bulia* (Picidae), *Ceuthmochares intermedius*, sp. n. (Cuculidae), *Pionias crassus*, sp. n. (Psittaci), *Syrnium bohndorffi*, sp. n. (Striges), *Melierax polyzonus* and *Falco ruficollis* (Falconidae). 112 species are given in all.

— [See also GOULD, J.; Timeliidae (*Alethe diademata*, &c.), *Ortho-cichla subulata*, g. & sp. nn. (Troglodytidae), *Laniarius lagdeni*, sp. n. (Laniidae), *Alseonax minima*, *Lioptilus abyssinicus* and *L. galinieri* (Muscicapidae), *Sitta whiteheadi*, sp. n. (Sittidae), *Progne* gen. (*Hirundinidae*), *Mesopicus schoensis* (Picidae), *Anthus cervinus* and *A. spinolletta* (Motacillidae).]

SHELLEY, G. E. [See *Muscicapa ? johnstoni*, sp. n. (Muscicapidae), *Nectarinia kilimensis*, sp. n., *N. reichenowi* (Nectariniidae), *Pratincola axillaris*, sp. n. (Sylviidae), *Sycobrotus reichenowi* (Ploceidae), *Apalis sharpii*, sp. n., *Crateropus squamulatus*, sp. n. (Timeliidae).]

SHUFFELDT, R. W. Concerning some of the forms assumed by the patella in Birds. P. U. S. Nat. Mus. vii. pp. 324-331; with 7 woodcuts in the text of the patella, &c.

— [See also *Ceryle alcyon* (Alcedinidae), *Numenius longirostris* (Scolopacidae), osteology.]

SIMSON, F. B. [See *Anas caryophyllacea* (Anatidae).]

SLADE, E. [See *Anas boscas* (Anatidae).]

SMITH, CECIL. [See *Procellaria leucorrhoea* (Procellariidae).]

SMITH, W. W. [See *Sceloglaux albifacies* (Striges), *Hieracidea novae-zealandiae* and *H. brunnea* (Falconidae).]

SOUZA, J. A. DE. [See *Bucorax pyrrhops* (Bucerotidae).]

STEJNEGER, L. On Changes in Ornithological Nomenclature. A reply to Critics. Auk, i. pp. 114-120. [Cf. Zool. Rec. xix. Aves, p. 19.]

— On the Use of Trinomials in American Ornithology. P. U. S. Nat. Mus. vii. pp. 70-81.

— Remarks on the Species of the Genus *Cephus*. T. c. pp. 210-229. [See Alcidae.]

[STEJNEGER, L.] Notes on the Genus *Acanthis*. Auk, i. pp. 145-156.
[See *Fringillidæ*.]

A discussion of the generic name, and of specific differences.

—. Ueber einige formen der Untergattung "Anorthura." Z. Ges. Orn. 1884, pp. 6-14.

The writer objects to H. Seebohm's decision that all the species of *Anorthura* lying between *A. nipalensis* and *A. pallidus* as extremes should be classed as varieties of *A. (Troglodytes) parvulus*. A key to the species and a synonymy follows.

—. *Analecta Ornithologica*. Auk, i. pp. 166-173, 225-236, & 358-367.

See *Turdus aliciae* (*Turdidæ*), *Anthus ludovicianus* (*Motacillidæ*), *Compsothlypis* gen., and *C. gutturalis*, *C. superciliosa* (*Mniotiltidæ*), *Loxia rubra*, *Habia* gen. (*Tanagridæ*), *Lagopus* gen., and *L. rupestris nelsoni*, subsp. n. (*Tetraonidæ*), *Rissa brevirostris*, *Larus affinis*, *L. leucopterus*, *L. glaucescens*, *L. schistisagus*, sp. n., *Larus* gen., and *Sterna nilotica* (*Laridæ*), *Priocilla tenuirostris* (*Procellariidæ*), *Surnia ulula* (*Striges*), *Lobipes tricolor* (*Scolopacidæ*). These papers also include derivations of names of birds, notes on changes in the nomenclature of genera, &c.

—. [See also *Attagen*, &c. (*Tetraonidæ*).]

—. [See also *Limicola hartlaubi*, *Pseudototanus guttifer* (*Scolopacidæ*), *Dendrocopus purus* and *D. immaculatus*, spp. nn. (*Picidæ*), *Alauda blakistoni*, sp. n. (*Alaudidæ*), *Lagopus albus alleni*, subsp. n. (*Tetraonidæ*), *Pica camtschatica*, *Corvus grebnitskii* (*Corvidæ*).]

STEPHENS, F. [See *Harporhynchus lecontei* (*Turdidæ*).]

STEVENSON, H. Ornithological Notes from Norfolk. Zool. 1884, pp. 378 & 411.

SWINBURNE, J. Notes on the Islands of Sula Sgeir, or North Barra and North Rona, with a list of the Birds inhabiting them. P. Phys. Soc. Edinb. 1883-84, pp. 51-67. [See *Procellaria leucorrhœa* (*Procellariidæ*).]

TACZANOWSKI, L. Ornithologie du Pérou. Rennes: 1884, 8vo, 2 vols., vii., 542, & 566 pp.

The introduction, of about 60 pages, treats of the country and the distribution of its birds. The author then describes the species known from Peru of the families *Vulturidæ*, *Falconidæ*, *Strigidæ*, *Steatornithidæ*, *Caprimulgidæ* [see *Lurocalis rufiventris*, sp. n.], *Cypselidæ*, *Hirundinidæ*, *Trochilidæ* [see *Leucippus viridicauda*], *Cerebidæ*, *Vireonidæ*, *Sylviidæ*, *Motacillidæ*, *Mniotiltidæ*, *Turdidæ*, *Cinclidæ*, *Troglodytidæ*, *Pteroptochidæ*, *Formicariidæ* [see *Thamnophilus nævius-albiventris*, *T. berlepschi*, and *Dysithamnus tambillanus*, spp. nn.], *Dendrocolaptidæ* [see *Synallaxis paucalensis* and *Anabazenops ruficollis*, spp. nn.], *Tyrannidæ* [see *Muscisaxicola grisea*, *M. juninensis*, *Leptopogon rufipectus*, and *Elainea gracilis*, spp. nn.], *Pipridæ* [see *Chloropipo unicolor*, sp. n.], *Cotingidæ*, *Phytotomidæ*, *Corvidæ*, *Icteridæ*, *Tanagridæ* [see *Phenicotheraps peruvianus*, *Nemosia pectoralis*, and *Buarremon albiceps*, spp. nn.].

[TACZANOWSKI, L.] Notice sur la mue anormale de certains oiseaux. Bull. Soc. Z. Fr. 1884, pp. 303 & 304.

Further information concerning the abnormal moulting of Ducks, Geese, and the Black Grouse. [See HAMONVILLE, D'.]

— [See also BERLEPSCH, H. v., & DYBOWSKI, B.]

TALSKY, J. [See *Stercorarius buffoni*, *S. pomatorhina* (*Laridæ*), *Tetrao intermedius* (*Tetraonidæ*).

TARCHANOFF, J. R. Ueber die Verschiedenheiten des Eiereiweisses bei befiedert gebornen (Nestflüchtern), und bei nackt gebornen (Nesthockern) Vögeln, und über die Verhältnisse zwischen dem Dotter und Eiereiweiss. Biol. Centralbl. iv. pp. 222-224.

— The Eggs of Birds. An abstract of a paper in Mém. Ac. Pétersb. xiii. (1883). Nature, March, 1884, p. 461.

An important article, stating that the albumen of the eggs of different species of Birds has different properties, but that by the application of chemical reagents, and also by incubation, it can be rendered similar in all cases.

TAYLOR, E. C. [See *Coccyzus americanus* (*Cuculidæ*).]

THOMPSON, R. H. [See *Ædemia perspicillata* (*Anatidæ*).]

TRAVERS, W. T. L. Some Remarks upon the Distribution of the Organic Productions of New Zealand. Tr. N. Z. Inst. xvi. pp. 461-467.

TRISTRAM, H. B. The Survey of Western Palestine. The Fauna and Flora of Palestine. London: 1884, 4to, Aves, pp. 30-139, pls. vii.-xiii.

The author mentions 348 species which occur in Palestine, with notes on their breeding, &c., and with their Arabic and Hebrew equivalents (where known). Figures are given of *Erithacus gutturalis* (*Sylviidæ*), *Cinnyris osea* (*Nectariniidæ*), *Serinus canonicus*, *Passer moabiticus*, and *Petronia brachydactyla* (*Fringillidæ*), *Amydrus tristrami* (*Sturnidæ*), *Caprimulgus tamaricis* (*Caprimulgidæ*), and *Plotus levaillantii* (*Plotidæ*).

— Notes on the Eighth Volume of the "Catalogue of Birds in the British Museum." Ibis, 1884, pp. 392-403.

The author criticises the treatment of the *Paridæ* [giving a translation of De Selys Longchamps' synopsis], the *Laniidæ* [*Clytorhynchus*, *Xenopirostris*, and the genera *Pachycephala* and *Lanius*], and the *Sittidæ*.

— On a Collection of San Domingo Birds. T. c. pp. 167 & 168.

See *Picumnus lawrencii* (*Picidæ*), *Ægialitis semipalmatus*, *Strepsilas interpres* (*Charadriidæ*), *Platala ajaja* (*Platalidæ*).

TSCHUSI ZU SCHMIDHOFFEN, V. v. Beiträge zur Ornithologie des Gömörer Comitates. Z. Ges. Orn. 1884, pp. 156-167.

A completion of a former list (by A. Lovassy) of the birds of the above county (in Hungary). [Cf. MT. ungar. Ak. Wiss. 1882, xviii. pp. 299-328.]

[TSCHUSI ZU SCHMIDHOFFEN, V. v.] [See *Acredula caudata* and *A. rosea* (*Paridae*), *Tetrao intermedius* (*Tetraonidae*), *Æx sponsa* (*Anatidae*).]

TURNER, M. H. [See *Vireo philadelphicus* (*Vireonidae*).]

ULM-ERBACH [BARON]. Die Geflügelzucht in Japan. MT. orn. Ver. Wien, 1884, pp. 7-11 (with 2 woodcuts in the text).

USSHER, R. J. [See *Sula bassana* (*Pelecanidae*), *Grus communis* (*Gruidae*).]

VERTEUIL, L. A. DE. Trinidad: its geography, natural resources, administration, present condition, and prospects. 2nd Ed. London, Paris, and New York: 1884, 8vo, 484 pp. [Two chapters on Birds.]

VILA, D. E. VAYREDA Y. Fauna ornitológica de la Provincia de Gerona, ó sea breve descripción de las aves sedentarias en la misma y las de paso accidentaló periódico, sus costumbres y alimentación bajo el punto de vista de utilidad ó perjuicio para con el hombre y la agricultura en general. Gerona: 1883, 8vo, 280 pp. (386 species).

VIS, C. W. DE. [See *Dinornis queenslandiae* (*Dinornithidae*).]

VORDERMAN, A. G. Bataviasche Vögels. iv.-vi. Tijdschr. Nederl. Ind. xliii. pp. 89-123 & 176-197; xliv. pp. 208-253. [Pt. iv. is omitted from Zool. Rec. xx.]

A continuation of notes on the birds of Java, from p. 239 of xlii. of the above work, in which 40 species are included.

—. List of the Birds of Java. *Op. cit.* xliv. pp. 187-207.

WALTER, A. [See *Turdus pilaris* (*Turdidae*).]

WARD, C. W. [See *Ardea wardi* (*Ardeidae*).]

WARDLAW-RAMSAY, R. G. Contributions to the Ornithology of the Philippine Islands. On two collections of Birds from the vicinity of Manilla. *Ibis*, 1884, pp. 330-335, pl. ix.

See *Circus melanoleucus* and *Falco melanogenys* (*Falconidae*), *Ceyx cyanopectus*, pl., and *C. philippensis* (*Alcedinidae*), *Cinnyris flammans*, (*Nectariniidae*), *Lalage melanoleuca* (*Campophagidae*), and *Melaniparus semilarvatus* (*Paridae*). 17 species in all are enumerated, of which 3 are additions to the author's List Philippine Birds in Append. Tweedd. Orn. Mem. pp. 655-660, while 2 others are possibly to be added.

WEITELY, H. Collecting in British Guiana. *Ibis*, 1884, pp. 356-358.

WIEDERSHEIM, R. Die Stammesentwicklung der Vögel. *Biol. Centralbl.* iii. pp. 654-668 & 688-695.

WIESE, H. F. Mittheilungen über einheimische Wirbelthiere und Insekten. *Schr. Ver. Schl.-Holst.* 1884, pp. 112-120.

The food of Birds, the effect of cutting hedges, &c., in the breeding time.

WILLARD, S. W. The Migration of our [American] Winter Birds. *Auk*, i. pp. 221-223.

WOLDRICH, J. N. Diluviale Fauna von Zuzlawitz bei Winterberg im Böhmerwalde. *SB. Ak. Wien*, 1883 (pub. 1884), pp. 978-1057; *Aves*, pp. 1036-1040.

WÜNDERLICH, L. Beiträge zur vergleichenden Anatomie und Entwicklungsgeschichte des unteren Kehlkopfes der Vögel. Halle : 1884, 4to, 80 pp., 4 pls.

ZIEMER, E. [See *Porzana maruetta* (Rallidæ).]

CARINATÆ.

PASSERES.

N.B.—The names of the genera are arranged alphabetically.

TURDIDÆ.

The usually admitted claims of this family to stand at the head of *Passeres* disputed ; A. Newton, *Encycl. Brit.* Ed. 9, xviii. pp. 47 & 48.

Geocichla machiki, sp. n. ; H. O. Forbes, *Rep. Brit. Ass.* 1884, p. 265 ; *id.* P. Z. S. 1884, p. 426, Timor-Laut. *G. schistacea*, sp. n. ; A. B. Meyer, *Z. Ges. Orn.* 1884, p. 211, Timor-Laut.

Harporynchus leontii, a description of its habits and of a supposed nest in the Colorado desert ; F. Stephens, *Auk*, i. pp. 353-358.

Hylocichla unalasce pallasi, one specimen taken in Texas ; N. C. Brown, *t. c.* p. 121.

Merula dactyloptera, the type is from Smyrna, not Syria ; T. Salvadori, *Ibis*, 1884, pp. 214-216. *M. migratoria propinqua* in Kansas ; N. S. Goss, *Auk*, i. p. 100 : no evidence of its occurrence in Texas (a correction of a former statement) ; N. C. Brown, *t. c.* p. 123. *M. cardis* and *M. chrysolaus*, the young in first plumage from Japan (unknown before) ; H. Seebohm, *Ibis*, 1884, p. 41.

Mimus gen., *sub voce* "Mocking-bird" ; A. Newton, *Encycl. Brit.* Ed. 9, xvi.

Mimus gilvus rostratus, subsp. n., ♂ ♀ described ; R. Ridgway, *P. U. S. Nat. Mus.* vii. No. 11, p. 173 ; from I. of Curaçoa, Venezuela.

Pseudocossyphus rufus, g. & sp. nn., from Massailand ; Fischer & Reichenow, *J. f. O.* 1884, p. 58.

Saxicola cypriaca [?], sp. n., from Cyprus ; E. F. v. Homeyer, *Z. Ges. Orn.* 1884, p. 397. *S. leucura* from Coimbra, Portugal ; Sclater, *Ibis*, 1884, p. 122. *S. schalowi*, sp. n., near *S. lugubris*, Rupp., from Massailand ; Fischer & Reichenow, *J. f. O.* 1884, p. 57.

Turdus aliciae, its occurrence in the Palæarctic region ; L. Stejneger, *Auk*, i. p. 166. *T. aliciae bicknelli* : ♂ juv. described from the Adirondacks ; C. H. Merriam, *t. c.* pp. 58 & 59 [cf. R. Ridgway, *P. U. S. Nat. Mus.* iv. pp. 377-379, and W. Brewster, *Bull. Nutt. Orn. Club*, viii. pp. 12-17]. *T. chrysolaus* [see *Merula*] of former list is the young of *T. obscurus* ; Dybowski & Taczanowski, *Bull. Soc. Z. Fr.* 1884, p. 161. *T. pilaris*, a breeding station in the Mark ; Walter, *J. f. O.* 1884, pp. 265-267 : breeding in Moravia ; W. Capek, *MT. orn. Ver. Wien*,

1884, p. 6. *T. roraimæ*, sp. n., from Mt. Roraima, B. Guiana (Whitely); Godman & Salvin, *Ibis*, 1884, pp. 443 & 444. *T. varius*, two occurrences in Yorkshire; Clarke & Roebuck, *Zool.* 1884, p. 174.

SYLVIIDÆ.

Acrocephalus turdoides in Hants; T. J. Mann, *Zool.* 1884, p. 343.
Curruca hortensis laying in the nest of *Hypolais salicaria*; Goltz, J. f. O. 1884, p. 245.

Cyanecula suecica, occurrence of a flock in Norfolk: J. H. Gurney, Jun., Tr. Norw. Soc. iii. pp. 597-601.

Daulias gen., sub voce "Nightingale"; A. Newton, *Encycl. Brit.* Ed. 9, xvii.

Daulias luscinia breeding in Yorkshire; Clarke & Roebuck, *Zool.* 1884, p. 175.

Gerygone bimaculata, sp. n., from New Guinea; A. B. Meyer, *Z. Ges. Orn.* 1884, pp. 198 & 199. *G. fulvescens*, sp. n., from Babbar; *id.* *SB. Ges. Isis*, 1884, p. 27.

Hypolais icterina at Blakeney, Norfolk (3rd occurrence in Britain); H. E. Dresser, P. Z. S. 1884, p. 478: new to Persia; Seebohm, *Ibis*, 1884, p. 426.

Locustella fluviatilis in Denmark; Rep. Brit. Ass. 1884, p. 269.

Lusciola africana, sp. n., from Massailand; Fischer & Reichenow, J. f. O. 1884, p. 182.

Myiadestes townsendi, nest and eggs described; W. E. Bryant, *Auk*, i. pp. 91 & 92 [cf. E. Coues, *Bull. Nutt. Orn. Club*, viii. p. 239].

Phylloscopus lugubris and its allies; a criticism of statements in "Cat. of Birds Brit. Mus.," vol. v.; W. E. Brooks, *Ibis*, 1884, p. 235.

Pacilodryas minor, sp. n., W. New Guinea; A. B. Meyer, *SB. Ges. Isis*, 1884, p. 27.

Pratincola axillaris, ♂ ♀, sp. n., from Kilimanjaro; G. E. Shelley, P. Z. S. 1884, pp. 556 & 557.

Reguloides humii and *R. superciliosus*, difference of plumage and note; Brooks, *Ibis*, 1884, p. 236.

Regulus calendula, description of its nest and eggs; M. Chamberlain, *Auk*, i. p. 90.

Ruticilla cairii; J. v. Madarász, *Z. Ges. Orn.* 1884, p. 120. *R. tilthys* shot in the Pentland Firth; J. A. Harvie-Brown, *Ibis*, 1884, p. 349.

Sylvia nisoria from Holderness, Yorkshire (H. H. Slater), from Blakeney, Norfolk (H. E. Dresser); P. Z. S. 1884, p. 477. The second and third records for Britain.

Tarsiger orientalis, sp. n., Massailand; Fischer & Reichenow, J. f. O. 1884, p. 57. Differs from *T. stellata* in having the tail feathers yellow instead of brown, and the upper tail coverts pure yellow instead of olive green (Sharpe, in "Cat. of Birds Brit. Mus.," iv. p. 261, says *P. stellata* has the upper tail coverts bright yellow). *T. chrysæus* in N.W. Himalayas; C. H. Marshall, *Ibis*, 1884, p. 416.

TIMELIIDÆ.

Notes on the family ; R. B. Sharpe, Notes Leyd. Mus. vi. pp. 167-178:—*Alethe diademata* = *A. maculicauda* ; *Cisticola oryziola* = *C. exilis* = *C. ruficeps* = *C. delicatissima* ; *Suya blythi*, Bp., = *Prinia leucophris*, Temm. (the type of the latter is in the Leyden Museum ; it is allied to *P. inornata* and *P. polychroa*, and is possibly identical with one of them) ; *Stachyris striolata* wrongly identified in "Cat. of Birds Brit. Mus.," with *S. poliocephala* ; *S. grammiceps*, ♂ ♀ described ; *Turdinus lepidopleurus* = *T. macrodactylus* ; *T. perspicillatus* is a perfectly distinct species, near *T. fulrescens* (its type is in the Leyden Museum) ; *Corythocichla epilepidota*, the types described (♂ ♀), near *C. striata* and *C. brevicaudata* ; *Mala-copterum lepidoccephalum* ; *M. erythrota* = *M. pyrrhogenys* (Temm.) ; *Malia* gen., near *Mystacornis*, description of type of *M. grata* ; *Stachyridopsis*, g. n. (Sharpe) must give way to *Cyanoderma* (type, *C. erythropterum*) ; *Cyanoderma melanothorax*, ♂ ♀ described (types of species), and the genus revised ; *Alcippe pyrrhoptera* is near *A. phayrii* ; *A. cinerea*, Blyth., = *Napothera phaionota* (Kuhl).

Apalis sharpii, sp. n., Gold Coast, near *Euprinodes schistaceus*, Cass. ; Shelley, Ibis, 1884, p. 45.

Burnesia melanocephala, sp. n., near *B. socialis*, Massailand ; Fischer & Reichenow, J. f. O. 1884, pp. 56 & 57.

Calamonastes fischeri, sp. n., near *C. undosa*, Massailand ; Fischer & Reichenow, t. c. p. 57.

Cisticola nana, sp. n., Massailand ; Fischer & Reichenow, t. c. pp. 260 & 261.

Crateropus bohdorffi, sp. n., near *C. atripennis*, Equat. Africa ; Sharpe, J. L. S. 1884, p. 422. *C. squamulatus* (♂), sp. n., from Mombasa, Africa ; Shelley, Ibis, 1884, pp. 45-49. The writer thinks it is nearest to *C. reinwardti*, and gives an amended key to the genus.

Euprinodes golzi, sp. n., next to *E. flavocincta*, Massailand ; Fischer & Reichenow, J. f. O. 1884, p. 182.

Megalurus pryri, sp. n., Tokio, Japan ; Seebohm, Ibis, 1884, p. 40. It is near *M. gramineus* of Australia, and possibly should come under the genus *Luscinola*.

Phyllostrephus parvus, sp. n., near *P. strepitans*, E. Africa ; Fischer & Reichenow, J. f. O. 1884, p. 262.

Pomatorhinus styani, sp. n., Lushan, Central China ; Seebohm, Ibis, 1884, pp. 263-265.

R[h]opophilus deserti, sp. n., Zaidam and Tarim, Tibet ; N. Przewalski, Reisen in Tibet, p. 92.

Stachyris nigriceps (of Hodgs. unedited plates in Brit. Mus.), ♂ from Cachar, Burma ; J. v. Madarász Z. Ges. Orn. 1884, p. 51.

Tricholais occipitalis, sp. n., compared with *T. pulchra*, Massailand ; Fischer & Reichenow, J. f. O. 1884, p. 181.

Turdinus sepiarius var. *minor*, Meyer, var. n., Java ; Meyer, Z. Ges. Orn. 1884, p. 210.

PARIDÆ.

Notes on the family. [See SELYS-LONGCHAMPS, E. DE.]

Acredula caudata, L., and *A. rosea*, Blyth ; V. Tschusi zu Schmidhoffen, MT. orn. Ver. Wien, 1884, p. 103. A correction of a note of A. Dubois, t. c. p. 74, as to the residence of the above species.

Cyanistes cœruleus is a good species, as are also *C. ultramarinus*, *C. persicus*, *C. pleskei*, *C. cyanus*, *C. flavipectus* : *C. teneriffæ* is a subsp. of *C. ultramarinus*, and *C. cyanus* var. *tian-schanicus* is a race ; Menzbier, Bull. Soc. Z. Fr. 1884, p. 285.

Melaniparus semilarvatus rediscovered in the Philippine Is. (Manilla) ; R. G. Wardlaw-Ramsay, Ibis, 1884, pp. 334 & 335.

Parus atriceps turneri, subsp. n., Alaska ; Ridgway, P. Biol. Soc. Wash. ii. p. 89. *P. fringillinus*, sp. n., Massailand ; Fischer & Reichenow, J. f. O. 1884, p. 56 [figured in Z. Ges. Orn. 1884, pl. xix.]. *P. hudsonicus evura*, subsp. n., Alaska ; E. Coues, Key N. A. Birds (2nd Ed.), p. 267. *P. kamtschatkensis* (pl. iv.), *P. palustris*, *P. fruticeti*, remarks on the 3 species and their synonymy ; J. v. Madarász, Z. Ges. Orn. 1884, pp. 75-79.

Psaltiriparus grindæ [a correction] ; Ridgway, P. Biol. Soc. Wash. ii. p. 96. *P. minimus californicus*, subsp. n., California ; *id.* t. c. p. 89.

TROGLODYTIDÆ.

Anorthura nipalensis, *A. parvulus*, *A. pallidus*, and allied species ; L. Stejneger, Z. Ges. Orn. 1884, pp. 6-14.

Henicorhina hilaris (of Stoltz., MS.), Ecuador, sp. n ? , ♂ ♀ described ; H. de Berlepsch & L. Taczanowski, P. Z. S. 1884, p. 284.

Orthnocichla subulata, Sharpe, g. & sp. nn., near *Pnoepyga*, ♂ described ; R. B. Sharpe, Notes Leyd. Mus. vi. pp. 179 & 180.

Thryophilus minlosi, sp. n., from New Granada ; H. v. Berlepsch, J. f. O. 1884, p. 249, pl. i. fig. 3.

Troglodytes hirtensis, sp. n., S. Kilda ; H. Seebohm, Zool. 1884, pp. 333-335. [Cf. t. c. pp. 383-385.]

Troglodytes dauricus, sp. n., Kamchatka ; Dybowski & Taczanowski, Bull. Soc. Z. Fr. 1884, p. 155. *T. pallescens* : Dybowski's description (Bull. Soc. Z. Fr. 1883, p. 357) completed ; *id.* t. c. pp. 153 & 154.

SITTIDÆ.

The family, *sub voce* "Nuthatch" ; A. Newton, Encycl. Brit. Ed. 9, xvii.

Sitta carolinensis ; remarks on its habits and breeding ; J. N. Clark, Z. Ges. Orn. 1884, pp. 80-83. *S. eckloni*, sp. n., River Baga-Gorgi, Tibet ; N. Przewalski, Reisen in Tibet, p. 207. *S. whiteheadi*, sp. n., Corsica, near *S. krueperi* ; R. B. Sharpe, P. Z. S. 1884, pp. 233, 329, 414, & 415, pl. xxxvi.

CERTHIIDÆ.

Certhia mandellii and *C. hodgsoni* confounded [a correction] ; W. E. Brooks, Ibis, 1884, p. 239.

Salpornis emini, sp. n.; G. Hartlaub, P. Z. S. 1884, pp. 415-417, pl. xxxvii.: description, remarks, and synonymy of other species of *Salpornis*. The species is from E. Equat. Africa, and is near *S. salvadorii* (*Hylypsornis*, Barb. du Bocage, by error).

Tichodroma muraria breeding in the environs of Vienna; Reiser, MT. orn. Ver. Wien, 1884, pp. 173 & 174.

MNIOTILTIDÆ.

Compsothlypis = *Parula*; the synonymy of the genus, with a synopsis of the species, and remarks on *Compsothlypis* (*Conirostrum*) *gutturalis* and *C. superciliosa*; L. Stejneger, Auk, i. pp. 168-170. The writer proposes to create a new genus *Oreothlypis* for the above.

Dendroica kirtlandi from Michigan; Ridgway, t. c. p. 389. *D. maculosa* summering in Massachusetts; W. Brewster, t. c. p. 15. *D. rufopileata*, sp. n., near *D. capitalis*, Lawr., ♂ ♀ described from I. of Curaçoa, Venezuela; Ridgway, P. U. S. Nat. Mus. vii. pp. 173 & 174.

Geothlypis philadelphia summering in Massachusetts; Brewster, Auk, i. p. 15. *G. trichas* wintering there; F. C. Browne, t. c. p. 389.

Helminthophaga leucobronchialis in Connecticut; J. H. Sage and W. Brewster, t. c. p. 91.

Hylophilus minor, Stoltzm., = *H. aurantiifrons*, Sclater; H. v. Berlepsch & L. Taczanowski, P. Z. S. 1884, No. 3, p. 313.

Ligea [scr. *Ligia*, fide "Ibis"] *palustris*, g. & sp. nn., near *Geothlypis*, ♂ ♀ described, with woodcut, and generic differences given; C. B. Cory, Auk i. pp. 1 & 2, pl. i. The name preoccupied, *Microligea* substituted; id. t. c. p. 290.

Mniotilta varia, a singular specimen; W. Brewster, t. c. pp. 190-192.

Oporornis agilis nesting in Manitoba; E. E. T. Seton, t. c. pp. 192 & 193.

Protonotaria citrea in Rhode I.; R. G. Hazard, t. c. p. 290.

VIREONIDÆ.

Lanivireo flavifrons, description of nest and eggs from Texas; N. S. Goss, Auk, i. pp. 124-126.

Vireo approximans, sp. n., near *V. crassirostris*, Bryant, ♂ described from I. of Old Providence, Caribbean Sea; Ridgway, P. U. S. Nat. Mus. vii. No. 12, pp. 179 & 180. *V. philadelphicus* in Northern New York; C. H. Merriam, Auk, i. p. 291: in the Adirondack region; M. H. Turner, *ibid.*

Vireosylvia grandior, sp. n., near *V. barbadense*, ♂ described from I. of Old Providence, Caribbean Sea; Ridgway, P. U. S. Nat. Mus. vii. No. 12, pp. 178 & 179.

MOTACILLIDÆ.

Anthus antarcticus, sp. n., from S. Georgian Is.; Cabanis, J. f. O. 1884, p. 254 & p. 248. *A. cervinus* at Brighton; Sharpe, P. Z. S. 1884, p. 206; J. H. Gurney, Jun., Zool. 1884, p. 192: in Kent; W.

Prentis, *t. c.* p. 272. *A. ludovicianus* a more recent name than *A. pennsylvanicus*; L. Stejneger, *Auk*, i. pp. 167 & 168. *A. pallescens* name preoccupied; F. Nicholson, *Ibis*, 1884, p. 469. *A. spinoletta* at Lancin-
Sussex; R. B. Sharpe, *P. Z. S.* 1884, p. 206.

Heterura sylvana, new to China; Seebohm, *Ibis*, 1884, p. 262.

Motacilla amurensis is the young of *M. blakistoni*; *id. t. c.* p. 181. *M. ocularis* of former list is the young ♀ of *M. japonica* of Swinhoe; Dybowski & Taczanowski, *Bull. Soc. Z. Fr.* 1884, p. 161.

LANIIDÆ.

Cracticus cassicus and *C. quoyi*, their eggs figured; A. B. Meyer, *Z. Ges. Orn.* 1884, pp. 283 & 284, pl. xviii. figs. 1-4.

Dryoscopus [Lanius] affinis (Gray) and *D. cubla* (Shaw) are specifically different, and include *D. orientalis (leucopsis)* and *D. salima* respectively; Fischer, *Z. Ges. Orn.* 1884, pp. 345-348.

Laniarius lagdeni, sp. n., from Ashantee, near *L. poliocephalus*; Sharpe, *P. Z. S.* 1884, p. 54, pl. v.

Lanius affinis, sp. n., near *L. colluris*, from E. Africa; Fischer & Reichenow, *J. f. O.* 1884, pp. 261 & 262 [see *Dryoscopus*]. *Lanius antinorii* (= *L. dorsalis*, Cab. ?) from Afmu, Danakil Country, N.E. Africa; T. Salvadori, *Ann. Mus. Genov.* 1884, p. 25. *L. borealis* and *L. cristatus* of Nelson's "Cruise of the Corwin" are *L. major* and *Phoenicurus brachyurus*, Pall.; Schalow, *Auk*, i. pp. 291 & 292. *L. collurio*, the colour of its eggs; E. v. Homeyer, *MT. orn. Ver. Wien*, 1884, p. 35. *L. homeyeri* = *L. excubitor* var.; J. v. Csátó, *Z. Ges. Orn.* 1884, pp. 229-234. *L. ludovicianus* in Massachusetts; Browne, *Auk*, i. p. 291. *L. magnirostris* and *L. major* new to Japan; Seebohm, *Ibis*, 1884, p. 37. *L. major*, Pall., differs from *L. borealis*, Vieill., and *L. excubitor*, L.; Cabanis, *J. f. O.* 1884, p. 251, (the form from Alaska is *L. major*). *L. schalowi*, sp. n. (♂ ♀), Central Africa; R. Böhm, *t. c.* p. 177; near *L. excubitorius*, Des Murs; H. Schalow, *t. c.* p. 178.

Otomela superciliosa of former list = *O. phanicura* (Pall.); Dybowski & Taczanowski, *Bull. Soc. Z. Fr.* 1884, p. 16.

Pachycephala affinis and *P. sp. ?*, New Guinea; Meyer, *Z. Ges. Orn.* 1884, pp. 200-203. *P. arctitorquis*, ♀, Meyer, from Timor-Laut, is the immature ♂; *P. kebirensis*, Meyer, is the adult ♀; *P. riedelii* is the young ♀; H. O. Forbes, *P. Z. S.* 1884, pp. 428 & 429: *cf. t. c.* p. 578. *P. kebirensis*, sp. n., Babbar, *P. riedelii*, sp. n., Timor-Laut; Meyer, *SB. Ges. Isis*, 1884, p. 35 [see above]. *P. melanura* is distinct from *P. chelidon*, *P. obiensis*, and *P. macrorhyncha*; Sharpe, *Rep. Voy. 'Alert'*, pp. 15 & 16. *P. sharpii*, sp. n., Babbar; Meyer, *SB. Ges. Isis*, 1884, p. 36.

Prionops poliolophus, sp. n., related to *P. plumatus*, from Massala; Fischer & Reichenow, *J. f. O.* 1884, p. 180.

Rhactes analogus, sp. n., Aru; Meyer, *Z. Ges. Orn.* 1884, pp. 284 & 285, pls. xiv. fig. 2, & xv. fig. 2. *R. decipiens*, *id. t. c.* p. 285, pl. xv. fig. 3. *R. sp. ?*, egg figured; *id. t. c.* pp. 285 & 286, pl. xvii. fig. 5. *R. rubiensis*, sp. n., figured; *id. t. c.* p. 285, pls. xiv. fig. 1, & xv. fig. 1; Rubi, New Guinea; *id. SB. Ges. Isis*, 1884, pp. 32 & 33.

Sigmodus mentalis, sp. n., near *S. rufoventris*, from Equatorial Africa ;
 7. Sharpe, J. L. S. 1884, p. 425.

CAMPOPAGIDÆ.

Campophaga petiti, *C. cœrulea*, spp. nn., from the Congo ; E. Oustalet, Ann. Sci. Nat. xvii. Nos. 5 & 6, Art. 8.

Graucalus lettiensis, sp. n., Letti ; Meyer, SB. Ges. Isis, 1884, p. 28.
G. timorlaensis, sp. n., Timor-Laut ; *id.* Z. Ges. Orn. 1884, p. 199, pl. ix. fig. 1.

Lalage leucomelena distinct from *L. karu* ; Sharpe, Rep. Voy. 'Alert,' p. 13. *L. melanoleuca*, ♀ described ; R. G. Wardlaw-Ramsay, Ibis, 1884, p. 334. *L. riedeli*, sp. n., from Kisser ; Meyer, SB. Ges. Isis, 1884, p. 29. *L. timoriensis* var. *celebensis*, Meyer, var. n., from S. Celebes, &c. ; *id.* t. c. p. 30.

MUSCICAPIDÆ.

Alseonax minima (Heugl.) distinct from *A. adusta* ; an amended description given ; Sharpe, P. Z. S. 1884, pp. 230 & 231 : the specimen is from Shoa, E. Africa. *A. murina*, sp. n., Massailand ; Fischer & Reichenow, J. f. O. 1884, p. 54.

Butalis sibirica new to Japan ; Seebohm, Ibis, 1884, p. 37.

Chloropeta massaica, sp. n., very near *C. natalensis*, Massailand ; Fischer & Reichenow, J. f. O. 1884, p. 54.

Cyornis beccariana from S.E. Borneo ; W. Blasius, t. c. p. 217.

Dioptrornis fischeri, g. & sp. nn., Massailand ; Fischer & Reichenow, t. c. pp. 53 & 54.

Leptotodus tenuis, g. & sp. nn., New Guinea ; Meyer, Z. Ges. Orn. 1884, p. 197, pl. ix. fig. 2.

Lioptilus abyssinicus and *L. galinieri*, ♀ of former described from Shoa, E. Africa ; Sharpe, P. Z. S. 1884, pp. 231 & 232. [Both omitted from "Cat. of Birds Brit. Mus."]

Microlestes arfakianus, g. & sp. nn., New Guinea ; Meyer, Z. Ges. Orn. 1884, p. 198.

Monarcha fuscescens, sp. n., Papuasias ; *M. geelvinkianus*, sp. n., Papuasias, Jobi, &c. ; *M. inornatus* (Garn.) var. *kisserensis*, var. n., Kisser ; *M. pileatus*, Salvad., an sp. n. ? (*buruensis*, Meyer), Buru ; Meyer, SB. Ges. Isis, 1884, pp. 24 & 25.

Muscicapa fulvifrons, Giraud, *Mitrephorus pallescens*, Cones, and *Empidonax rubicundus*, Cab., are geographical races of the same species ; Ridgway, P. Biol. Soc. Wash. ii. pp. 108-110. *Muscicapa* ? *johnstoni*, ♀, sp. n., near *M. cœrulescens*, Hartl., Kilimanjaro ; Shelley, P. Z. S. 1884, p. 555. *M. parva* in Berwick ; Bolam, Naturalist, Aug., 1884, p. 9 : breeding in Moravia ; Capek, MT. orn. Ver. Wien, 1884, p. 6.

Myiagra ruficollis, its egg figured ; Meyer, Z. Ges. Orn. 1884, pp. 281 & 282, pl. xvii. fig. 6.

Philentoma pyrrhopterum from S.E. Borneo ; W. Blasius, J. f. O. 1884, p. 217.

Piezorhynchus medius, sp. n., Port Molle, Queensland ; Sharpe, Rep. Voy. 'Alert,' pp. 14 & 15.

Platystira albifrons recorded for the first time from Shoa, E. Africa ; Salvadori, Ann. Mus. Genov. 1884, p. 26.

Rhipidura fallax, sp. n. ?, near *R. brachyrhyncha*, from New Guinea ; E. P. Ramsay, P. Z. S. 1884, pp. 580 & 581. *R. flabellifera* and *R. fuliginosa* interbreeding ; T. H. Potts, t. c. p. 530. *R. lenzi* in Amboina ; H. O. Forbes, t. c. p. 431.

Siphia cachariensis, sp. n. (♀), Cachar, Burma ; J. v. Madarász, Z. Ges. Orn. 1884, pp. 51 & 52, pl. i. fig. 2. *S. lempricri*, sp. n. (♂), S. Palawan, Philippine Archipelago ; Sharpe, Ibis, 1884, pp. 319 & 320.

Terpsiphone senegalensis distinct from *T. cristata* ; Rochebrune, Act. Soc. L. Bord. viii. p. 297.

Xanthopygia cyanomelena, correction of an error in "Cat. of Birds Brit. Mus.," iv. p. 251 ; Seebohm, Ibis, 1884, pp. 180 & 181.

Zeocephus cyanescens (prob. ♀) from S. Palawan, Philippine Archipelago ; Sharpe, t. c. pp. 320 & 321.

PYCNONOTIDÆ.

Chloropsis viridinucha, S.E. Borneo ; W. Blasius, J. f. O. 1884, p. 218.

Pyysipetes sp. ? from E. India ; Meyer, Z. Ges. Orn. 1884, pp. 212 & 213.

Ixonotus landlance, sp. n. (♀), Congo ; Oustalet, Ann. Sci. Nat. xvii. Nos. 5 & 6, Art. 8.

Ixulus flavicollis in N.W. Himalayas ; C. H. Marshall, Ibis, 1884, p. 417.

Pycnonotus analis var. *alba* [sic], Borneo ; Meyer, Z. Ges. Orn. 1884, p. 213. *P. salvadorii* from S.E. Borneo ; W. Blasius, J. f. O. 1884, p. 218.

Xenocichla tenuirostris, sp. n., near *X. canicapilla*, E. Africa ; Fischer & Reichenow, t. c. p. 262.

ORIOOLIDÆ.

The family, *sub voce* "Oriole" ; A. Newton, Encycl. Brit. Ed. 9, xvii.

Mimeta (*Oriolus*) *flavocincta*, its egg figured, &c. ; Meyer, Z. Ges. Orn. 1884, p. 292, pl. vii. fig. 1.

ARTAMIDÆ.

Artamus musschenbroeki, sp. n., Tenimber and Timor-Laut ; Meyer, SB. Ges. Isis, 1884, pp. 30 & 31 : = *A. leucogaster* (Val.) ; H. O. Forbes, P. Z. S. 1884, p. 427 : the opposite view ; Salvadori, t. c. p. 578.

DICRURIDÆ.

Bradyornis boehmi, sp. n. ; A. Reichenow, J. f. O. 1884, pp. 253 & 254. *B. diabolicus*, Sharpe, = *B. ater*, ? ; R. B. Sharpe, J. L. S. 1884, p. 423.

Bradyornis, Sundev., and *Melanornis*, Gray, distinguished ; a table of the genera and species ; Cabanis, J. f. O. 1884, pp. 240 & 241.

Melanocephala tropicalis, sp. n. ; Cabanis, t. c. p. 241.

HIRUNDINIDÆ.

Chelidon dasypus = *C. blakistoni* ; Seebohm, Ibis, 1884, p. 180.

Cotyle ambrosiaca, its synonymy ; Rochebrune, Act. Soc. L. Bord. viii. p. 299. *C. rufigula*, sp. n., Massailand ; Fischer & Reichenow, J. f. O. 1884, p. 53.

Hirundo sp. ?, its nest and eggs from Aru ; Meyer, Z. Ges. Orn. 1884, p. 279. *H. javanica* from Timor-Laut ; H. O. Forbes, P. Z. S. 1884, p. 426. *H. poucheti* sp. n., W. Africa [cf. Zool. Rec. xx. *Hirundinidæ*], nidification and eggs ; L. Petit, Bull. Soc. Z. Fr. 1884, pp. 79 & 80. *H. rustica baicalensis*, subsp. n., compared with *H. r. saturata*, *H. r. gutturalis*, *H. r. borealis* ; Dybowski & Taczanowski, Bull. Soc. Z. Fr. 1884, pp. 150-153. *H. sclateri*, sp. n., = *H. euchrysea*, Bryant, nec Gosse ; Cory, Auk, i. pp. 2 & 3.

Hylochelidon nigricans [see BULLER, W. L.].

Progne purpurea (= *subis*), *P. furcata*, *P. concolor*, and *P. elegans* (which is a combination of ♂ of *P. purpurea* and ♀ and juv. of *P. furcata*) ; Sharpe, Auk, i. pp. 367 & 368.

Psulidoprocne antinorii, sp. n., from Shoa, N.E. Africa ; Salvadori, Ann. Mus. Genov. 1884, p. 123. *P. petiti*, its nest and eggs ; Petit, Bull. Soc. Z. Fr. 1884, p.-v. pp. vii. & viii.

NECTARINIIDÆ.

Arachnothera chrysogenys and *A. crassirostris* from S.E. Borneo ; Blasius, J. f. O. 1884, pp. 217 & 218.

Cinnyris acik, Antin., is a good species ; Sharpe, J. L. S. 1884, pp. 428 & 429. *C. erikssoni* = *Nectarinia ludovicensis* ; Barboza du Bocage, J. Sci. Lib. xxxiv. p. 105 [1883]. *C. falkensteini*, sp. n., near *C. affinis*, Massailand ; Fischer & Reichenow, J. f. O. 1884, p. 56. *C. flagrans* omitted from List of Philippine Birds, in Append. Tweedd. Mem. ; R. G. Wardlaw-Ramsay, Ibis, 1884, p. 331. *C. henkii*, sp. n., E. Indian Archipelago ; Meyer, Z. Ges. Orn. 1884, pp. 207 & 208, pl. vii.

Cyrtostomus melanocephalus omitted from "Cat. of Birds," ix. ; Salvadori, Ibis, 1884, p. 326.

Drepanorhynchus reichenowi (♂), g. & sp. nn., Massailand ; Fischer & Reichenow, J. f. O. 1884, p. 56. [See also FISCHER, G. A., and for further description of ♂ and ♀, P. Z. S. 1884, p. 556, pl. li.]

Nectarinia kilimensis, ♂ ♀, sp. n., near *N. tacaze*, Kilimanjaro : N. reichenowi, ♂, Kilimanjaro [see *Drepanorhynchus*] ; Shelley, P. Z. S. 1884, pp. 555 & 556. *N. melanogaster*, sp. n., next to *N. pulchella*, Massailand ; Fischer & Reichenow, J. f. O. 1884, p. 181. *N. subfumosa*, sp. n. ?, Shoa, N.E. Africa ; Salvadori, Ann. Mus. Genov. 1884, p. 25.

MELIPHAGIDÆ.

Anthochaera [sic] *carunculata* [see BULLER, W. L.].

Glycyphila modesta, egg figured, &c. ; Meyer, Z. Ges. Orn. 1884, p. 288, pl. xviii. figs. 7 & 8.

Myzomela sp. n. ?, from Ceram [see *Stigmatops blasii*] ; *id.* t. c. pp. 208

& 209. *Myzomela guentheri* is not a new species, but = *M. erythromelas*, Salvad.; Salvadori, Ibis, 1884, p. 326. *M. infusata*, Salvad., omitted in "Cat. of Birds Brit. Mus.," ix.; *id. ibid.* *M. obscura*, a further description; Sharpe, Rep. Voy. 'Alert,' p. 17. *M. wakoloensis*, ♀, is it identical with Meyer's *Myzomela* from Ceram? [*suprà*]; H. O. Forbes, P. Z. S. 1884, p. 429.

Philemon kisserensis, sp. n., Kisser, near Timor; Meyer, SB. Ges. Isis, 1884, p. 41. *P. timorlaoensis*, Meyer, sp. n. [?], *ibid.*, = *P. plumigenis*?; H. O. Forbes, P. Z. S. 1884, p. 429 [*cf. t. c. p.* 579].

Ptilotis notutu and others of this genus discussed; Rep. Voy. 'Alert,' pp. 19 & 20.

Stigmatops blasii, is it identical with *Myzomela* from Ceram? [*suprà*]; Salvadori, Ibis, 1884, p. 327. *S. kebirensis*, sp. n., Babbar, Kebir, near Timor-Laut; Meyer, Z. Ges. Orn. 1884, pp. 218 & 219 [a key to the species is given]. *S. salvadorii*, sp. n., from Timor-Laut; *id. t. c.* pp. 217 & 218. *S. subocularis* and others of this genus discussed; Sharpe, Rep. Voy. 'Alert,' pp. 18 & 19.

Tropidorhynchus aruensis, sp. n., very near *T. timoriensis*, Müll., Aru; Meyer, Z. Ges. Orn. 1884, pp. 216 & 217: its egg figured, &c.; *id. t. c.* pp. 290 & 291, pl. xviii. figs. 5 & 6.

Xanthotis rubiensis, sp. n., Rubi, New Guinea; Meyer, *t. c.* pp. 289 & 290.

Zosterops eurycricotus, sp. n., Massailand; Fischer & Reichenow, J. f. O. 1884, p. 55. *Z. incerta*, sp. n., Meyer, Z. Ges. Orn. 1884, p. 209.

DICÆIDÆ.

Dicaeum sp. ? (♂) from Cachar, Burma; J. v. Madarász, Z. Ges. Orn. 1884, p. 53, pl. i. fig. 3. *Dicaeum salvadorii*, sp. n., Babbar, near Timor-Laut; Meyer, SB. Ges. Isis, 1884, pp. 38 & 39.

CEREBIDÆ.

Certhiola tricolor, sp. n., near *C. bahamensis*, from I. of Old Providence, Caribbean Sea, ♂ and juv. described; Ridgway, P. U. S. Nat. Mus. vii. No. 12, p. 178.

Diglossa albilateralis, from Ecuador, differs slightly from specimens from Bogota and Peru; v. Berlepsch & Taczanowski, P. Z. S. 1884, p. 287.

TANAGRIDÆ.

Arremon and *Buarremon* [see GODMAN, F. D., & SALVIN, O.].

Buarremon albiceps, sp. n., Paucal, Peru; Taczanowski, Orn. du Pérou, ii. p. 533. *B. capitalis* and *B. tibialis* figured [see GODMAN, F. D., & SALVIN, O.]. *B. inornatus* compared with a specimen named *B. brunneinuchus* by J. Verreaux; v. Berlepsch & Taczanowski, P. Z. S. 1884, pp. 291 & 292.

Calliste aurulenta, Lafr., *C. nigroviridis* (Lafr.), *C. ruficervix*, Prev., from

Ecuador, differ slightly from specimens from Bogota ; *id. t. c.* pp. 288 & 289. *C. whitelyi*, sp. n., M. Roraima, B. Guiana ; Godman & Salvin, Ibis, 1884, p. 445, pl. xiii.

Calyptophilus, g. n. (*frugivorus*), near *Phanicoophilus*, the generic differences given and ♂ ♀ redescribed, with woodcut in text ; C. B. Cory, Auk, i. pp. 3 & 4.

Chlorophonia roraimæ, sp. n., M. Roraima, B. Guinea ; Godman & Salvin, Ibis, 1884, p. 444.

Chlorospingus, g. ; *C. hypophæus*, *C. pileatus*, *C. punctulatus* (figured) ; [see GODMAN & SALVIN]. *C. ochraceus*, ♀, sp. n., from Ecuador, near *C. melanotis* ; v. Berlepsch & Taczanowski, P. Z. S. 1884, p. 291, pl. xxiv. fig. 1.

Dubusia tenuata from Ecuador differs from specimens from Colombia ; *id. t. c.* pp. 289 & 290.

Habia v. Zamelodia ; Stejneger, Auk, i. pp. 366 & 367.

Nemosia pectoralis, sp. n., Acancocha, Central Peru ; Taczanowski, Orn. du Pérou, ii. p. 508.

Phanicothraupis peruvianus, sp. n., Yurimaguas, Monterico, Chamicuros, and Chayavetas, Peru : *id. t. c.* pp. 498 & 499. *P. stolzmanni* is a good species ; v. Berlepsch & Taczanowski, P. Z. S. 1884, p. 313.

Pitylus, g. ; *P. celano* (figured) ; [see GODMAN & SALVIN].

Tacilothraupis lunulata from Ecuador is intermediate between *P. lunulata* of Bogota and *P. atricrissa* of Quito ; v. Berlepsch & Taczanowski, P. Z. S. 1884, p. 289.

Sallator, g., *S. atriceps* and *S. magnoides* [see GODMAN & SALVIN].

PLOCEIDÆ.

Calyphantria erythrogenys, sp. n., near *C. melanotis*, from Massailand (wrongly identified by Dr. Hartlaub) ; Fischer & Reichenow, J. f. O. 1884, p. 181 : from Matruï, Massailand, and Lado ; Fischer, Z. Ges. Orn. 1884, pp. 332 & 333.

Cryptospiza (g. n.) *reichenowi*, first record from E. Africa [Shoa] ; T. Salvadori, Ann. Mus. Genov. 1884, p. 26.

Euplectes friederichseni, sp. n., from Massailand ; Fischer & Reichenow, J. f. O. 1884, p. 54. *E. scioanus*, sp. n., Shoa, N.E. Africa ; Salvadori, Ann. Mus. Genov. 1884, p. 25.

Hyphantornis castaneigula, sp. n., from Zambesi ; Cabanis, J. f. O. 1884, p. 240, pl. iii. fig. 1. *H. mariguensis* and *H. velutus* are two races of the same species ; J. H. Gurney, Ibis, 1884, p. 229. *H. melanops*, sp. n., Zambesi, very near *H. vitellina* ; Cabanis, J. f. O. 1884, p. 240, pl. iii. fig. 2. *H. meloxit*, sp. n. ?, Shoa, N.E. Africa ; Salvadori, Ann. Mus. Genov. 1884, p. 25.

Munia sp. ?, nest and eggs from Aru ; Meyer, Z. Ges. Orn. 1884, p. 292.

Nigrita cabanisi, sp. n., from Massailand ; Fisher & Reichenow, J. f. O. 1884, pp. 54 & 55.

Pyromelana nigrifrons (♂), sp. n., Central Africa ; Böhm, t. c. p. 177.

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Quclea occidentalis and *Q. orientalis* separated; A. T. de Rochebrune, Act. Soc. L. Bord. viii. p. 320.

Spermospiza hamatina = *S. guttata*; *id. l. c.* p. 330.

Sycobrotus reichenowi (♂ ♀), sp. n., near *S. emini*, from Massailand; Fischer & Reichenow, J. f. O. 1884, pp. 180 & 181: ♂ and prob. ♀ from Kilimanjaro; Shelley, P. Z. S. 1884, pp. 557 & 558.

Textor scioanus, sp. n., Shoa, N.E. Africa; Salvadori, Ann. Mus. Genov. 1884, p. 25.

FRINGILLIDÆ.

Acanthidops bairdi should be referred to *Fringillidæ*; Sclater, Ibis, 1884, p. 241.

Acanthis, the species and subspecies of the genus; Stejneger, Auk, i. pp. 145-156.

Ammodromus petenicus from Guatemala, the type specimen compared with N. American forms; Ridgway, Ibis, 1884, p. 44.

Carpodacus hamorrhous should be *C. mexicanus*; Ridgway, P. Biol. Soc. Wash. ii. pp. 110 & 111.

Catamenia homochroa, Sel., = *C. inornata* of Taczanowski, from Peru, but is not the true *C. inornata* (Lafr.); v. Berlepsch & Taczanowski, P. Z. S. 1884, p. 293.

Chrysomitris atriceps from Guatemala, the type specimens compared with N. American forms; Ridgway, Ibis, 1884, pp. 43 & 44. *C. siemiradskii*, Berl. & Tacz., is a very good species, *C. icterica* of Sclater's list probably = *C. capitalis*, Cab.; v. Berlepsch & Taczanowski, P. Z. S. 1884, p. 313.

Coccothraustes vulgaris breeding in Durham and Northumberland; Clarke, Naturalist, Aug. 1884, p. 19: in North Yorks; Carter, Zool. 1884, p. 487.

Coraphites leucopareia, sp. n., Massailand; Fischer & Reichenow, J. f. O. 1884, p. 55.

Cyanospiza, sub voce "Nonpareil"; A. Newton, Encycl. Brit. Ed. 9, xvii.

Fringilla albigularis, Mad.; J. v. Madarász, Z. Ges. Orn. 1884, p. 145, pl. iii.

Idiopsar brachyurus (from La Paz, Bolivia) should perhaps be placed among the *Fringillidæ* instead of the *Icteridæ*; Sclater, Ibis, 1884, pp. 240 & 241, pl. vii.

Junco hiemalis connectens, subsp. n., Colorado; Coues, Key N. A. Birds (2nd ed.) p. 378.

Linota linaria and its allies, their red plumage peculiar to the first (?) year; Brooks, Ibis, 1884, pp. 234 & 235.

Loxia curvirostra, its colouring; Homeyer, MT. orn. Ver. Wien, 1884, p. 42. *L. curvirostra bendirii*, subsp. n., from East U. S.; Ridgway, P. Biol. Soc. Wash. ii. pp. 101-106. *L. leucoptera* of former list = *L. bifasciata*, Selys; B. Dybowski & L. Taczanowski, Bull. Soc. Z. Fr. 1884, p. 161. *L. rubra* (*Cardinalis ruber*), on the earliest available name; Stejneger, Auk, i. pp. 171 & 172.

Megalophonus massaicus, sp. n., Massailand; Fischer & Reichenow, J. f. O. 1884, p. 55.

Melospiza fasciata montana, subsp. n., distinguished from *M. fallax*, South U. S.; Henshaw, Auk, i. pp. 223 & 224.

Passer rufocinctus, sp. n., near *P. motitensis*, Massailand; Fischer & Reichenow, J. f. O. 1884, p. 55.

Passerculus beldingi, sp. n., California, possibly a local race of *P. anthinus*, ♂ ♀ described; Ridgway, P. U. S. Nat. Mus. vii. pp. 516 & 517. *P. princeps*, its breeding place; *id.* Auk, i. pp. 292 & 293; C. H. Merriam, t. c. p. 390. *P. sandvicensis bryanti*, subsp. n., California, ♂ ♀ described; Ridgway, P. U. S. Nat. Mus. vii. pp. 517 & 518.

Phonipara phaeoptila, sp. n., M. Roraima, B. Guiana; Godman & Salvin, Ibis, 1884, p. 445.

Plectrophenax hyperboreus, sp. n., Alaska; Ridgway, P. U. S. Nat. Mus. vii. p. 68.

Serinus pectoralis, sp. n., Kurrachee; J. A. Murray, Vertebr. Zool. of Sind, pp. 190 & 191.

Sorella emini from Shoa, N.E. Africa, only known hitherto from Lado; Salvadori, Ann. Mus. Genov. 1884, p. 26.

"*Spermophila pauper*, Stolz., MS.," = *S. obscura* (cf. Tacz., P. Z. S. 1880, p. 199), ♂ ♀ described; v. Berlepsch & Taczanowski, P. Z. S. 1884, p. 293, pl. xxiv. fig. 2.

Spizella pinetorum from Guatemala, type compared with N. American forms; Ridgway, Ibis, 1884, pp. 44 & 45. *S. wortheni*, sp. n., near *S. pusilla*, ♂ from New Mexico; *id.* P. U. S. Nat. Mus. vii. p. 259.

Sycalis columbiana? from the Orinoco; v. Berlepsch, Ibis, 1884, p. 433.

Zonotrichia gambeli intermedia in Kansas; N. S. Goss, Auk, i. p. 100. *Z. querula*, its distribution and migration; Cooke, t. c. pp. 332-337.

ALAUDIDÆ.

Alauda blakistoni, sp. n., from Kamtschatka and Bering I.; Stejneger, P. Biol. Soc. Wash. ii. fig. 98.

Otocorys, remarks on the genus; DuBois, Bull. Mus. Belg. iii. 1884, p. 223. The writer wishes to reduce all the forms to one species.

Otocorys alpestris in the United States and adjacent territory; five new races are described, with diagnoses—*pratincta*, *arenicola*, *giraudi*, *rubens*, *strigata*; H. W. Henshaw, Auk, i. pp. 254-268. *O. brandti* differs specifically from *O. longirostris* [a correction]; Dresser, Ibis, 1884, pp. 116-118. *O. longirostris*, remarks; Seebohm, t. c. pp. 184-188.

Pyrgilauda kansuensis, sp. n., from between Tscha-gryn-gol and Alaschan, Tibet; N. Przewalski, Reisen in Tibet, p. 243.

STURNIDÆ.

Calornis circumscripta, sp. n., from Timor-Laut; Meyer, SB. Ges. Isis, 1884, p. 49: it is identical with *C. gularis*, G. R. Gr.; H. O. Forbes, P. Z. S. 1884, pp. 429 & 430: the differences from *C. metallica* are also given, with remarks on *C. purpurascens* and *C. purpureiceps*; *ibid.*: the

opposite view ; T. Salvadori, *t. c.* p. 579. *C. minor* (Müll.), an sp. n. ? ; Meyer, SB. Ges. Isis, 1884, pp. 48 & 49.

Creadion cinereus [see BULLER, W. L.].

Heterolocha acutirostris, its habits and nest ; T. H. Potts, Zool. 1884, pp. 386 & 387.

Notauges fischeri (♀), sp. n., near *N. albicapillus*, Massailand ; Fischer & Reichenow, J. f. O. 1884, p. 54.

Pastor roseus in Sutherland ; Macpherson, Zool. 1884, p. 339.

ICTERIDÆ.

Icterus curasoensis, sp. n., I. of Curaçoa, Venezuela, ♂ described, with notes on *I. xanthornus* ; Ridgway, P. U. S. Nat. Mus. vii. pp. 174-176.

Idiopsar brachyurus. [See *Fringillidæ*.]

Molothrus ater, egg in nest of Carolina Dove ; Coues, Auk, i. p. 293.

P. L. SCLATER, Ibis, 1884 :—*Molothrus obscurus* = *M. pecoris*, p. 4 ; *Molothrus robustus*, Cab. Mus. Hein., = *M. aeneus*, p. 5 [cf. p. 7] ; *Agelaius cyanopus* figured, from Rio Parana, p. 13 (pl. i.) ; *Neopsar nigerrimus* should be *Agelaius nigerrimus*, p. 14 ; *Xanthocephalus longipes* should take the place of *X. icterocephalus*, p. 14 ; *Xanthornus* (Scop.) is not synonymous with *Amblyrhampus* (Leach), but with *Icterus* (Briss.), pp. 17 & 18 [footnote] ; *Leistes erythrothorax*, Pelzelu, = *L. guianensis*, p. 22 ; *Quiscalus graysoni*, sp. n., near *Q. macrurus*, from Mazatlan, Mexico, and Presidio, W. Mexico, p. 157 ; *Quiscalus tenuirostris* figured, from Central Mexico, = *Q. palustris* of Swainson, probably, pp. 157 & 158, pl. v. ; *Quiscalus inflexirostris*, = *Q. lugubris* ? = *Q. guadeloupensis* ?, p. 160. Should *Cassidix* be under *Quiscalinæ* or *Cassicinæ* ?, p. 164.

CORVIDÆ.

The claims of the family to stand at the head of *Passeres*, and consequently of all Birds, as originally urged by MacGillivray and Parker, substantiated ; A. Newton, Encycl. Brit. Ed. 9, xviii. p. 49.

Corvus capellanus in Zool. Gardens ; Sclater, P. Z. S. 1884, p. 475. *C. corax kamtschaticus* compared with *C. c. beringianus* ; Dybowski & Taczanowski, Bull. Soc. Z. Fr. 1884, pp. 156 & 157. *C. cryptoleucus* in Kansas ; N. S. Goss, Auk, i. p. 100. *C. japonensis*, Bp., and its connection with *C. corax*, L. ; Brauns, Tr. A. S. Japan, xii. pp. 230-242, pl. The writer maintains that the above species are identical, differing too slightly to be separated as Blakiston & Pryer wish ; a note follows [on p. 242], by Milne, criticising the paper. *C. latiostris*, sp. n., Timor. Laut ; Meyer, Z. Ges. Orn. 1884, pp. 199 & 200 : it is identical with *C. validissimus*, Sclat., nec Schl. ; Salvadori, P. Z. S. 1884, p. 580 (cf. *t. c.* p. 433, and op. cit. 1883, pp. 21 & 200). *C. salvadorii*, sp. n. [cf. Salvadori, Prodr. p. 18, spec. 2], ♀, Pt. Moresby, New Guinea ; Finsch, MT. orn. Ver. Wien, 1884, p. 109.

Cryptorhina afra ; Rochebrune, Act. Soc. L. Bord. viii. p. 316.

Cyanocorax violaceus new to Venezuela ; v. Berlepsch, Ibis, 1884, p. 433.

Nucifraga, sub voce "Nutcracker"; A. Newton, Encycl. Brit. Ed. 9, xvii.

Pica camtschatica and *Corvus grebnitskii* from Kamtschatka and Commander Is.; Stejneger, P. Biol. Soc. Wash. ii. p. 97.

Picicorvus columbianus, the young female described from Colorado, and certain black markings, not before observed, said to occur on the four outer rectrices; C. F. Batchelder, Auk, i. p. 4.

PARADISEIDÆ.

Amblyornis subalaris, sp. n., near *A. inornatus*; Sharpe, J. L. S. xvii. p. 408.

Diphyllodes wilsoni, from Waigiou; Nehr Korn, Ibis, 1884, p. 467.

Paradisea apoda, description of its (probable) egg; Meyer, Z. Ges. Orn. 1884, p. 293, pl. xvii. fig. 2. *P. minor*, from Jobi I.; Selater, P. Z. S. 1884, p. 251. *P. susannæ* = *P. decora*; Salvadori, Ibis, 1884, p. 354.

PITTIDÆ.

Pitta vigorsi, Mey. (nec Gould), from Timor-Laut; Salvadori, P. Z. S. 1884, p. 579.

TYRANNIDÆ.

Chnipolegus orenocensis, sp. n., Angostura, Venezuela; v. Berlepsch, Ibis, 1884, pp. 433 & 434, pl. xii.

Contopus albicollis, sp. n.?, Yucatan; Lawrence, Ann. N. York Ac. iii. p. 156.

Elainea cinerescens, sp. n., near *E. martinica*, ♂ ♀ described, from I. of Old Providence, Caribbean Sea; Ridgway, P. U. S. Nat. Mus. vii. p. 180. *E. gracilis*, sp. n., from Chirimoto, Peru; L. Taczanowski, Orn. du Pérou, ii. p. 271 [see P. Z. S. 1882, p. 20]. *E. griseigularis* distinguished from *E. modesta*; v. Berlepsch & Taczanowski, P. Z. S. 1884, p. 296. *E. olivina*, sp. n., from M. Roraima, B. Guiana; Godman & Salvin, Ibis, 1884, pp. 446 & 447.

Euscarthmus russatus, sp. n., M. Roraima; *id. ibid.*

Leptopogon nigrifrons, sp. n., M. Roraima; *id. ibid.* *L. rufipectus*, sp. n., Ropaybamba and Rayurmana, Peru; Taczanowski, Orn. du Pérou, ii. p. 249.

Muscisaxicola grisea, sp. n., Maraynioc, Peru; *id. t. c.* pp. 213 & 214. *M. juninensis*, sp. n., Junin, Peru; *id. t. c.* pp. 214 & 215.

Myiarchus mexicanus magister, subsp. n., W. Mexico; Ridgway, P. Biol. Soc. Wash. ii. pp. 90 & 91. *M. lawrencii olivascens*, subsp. n., Tehuantepec; *id. t. c.* pp. 91-93.

Myiodynastes chrysocephalus, ♂ ♀ from Ecuador differ from specimens from Peru; v. Berlepsch & Taczanowski, P. Z. S. 1884, pp. 296 & 297.

Phyllomyias cristatus, sp. n., near to *P. (Tyranniscus) griseiceps*, from New Granada; v. Berlepsch, J. f. O. 1884, pp. 250 & 300.

Todirostrum (Pæcilotriccus) lenzi, sp. n. near *T. rufigenis*, New Granada ; *id. t. c.* pp. 249, 250, pl. i. figs. 1 & 2, & 298.

Tyranniscus uropygialis (Lawr.) is not a *Mecocerculus* ; Berlepsch & Taczanowski, P. Z. S. 1884, p. 296.

Tyrannus melancholicus couchi, description of nest and eggs ; Sennett, Auk, i. p. 93.

PIPRIDÆ.

Chloropipo unicolor, sp. n., Amable Maria, Peru ; Taczanowski, Orn. du Pérou, ii. pp. 335 & 336. *C. uniformis*, sp. n., from M. Roraima, B. Guiana ; Godman & Salvin, Ibis, 1884, p. 447.

Lathria streptophora, sp. n. (♂), M. Roraima ; *iid. t. c.* pp. 448 & 449, pl. xiv.

Pipra iracunda, sp. n., M. Roraima ; *iid. t. c.* pp. 447 & 448.

COTINGIDÆ.

Carpodectes antoniae, sp. n. (♂), Pirris, S.W. Costa Rica ; Ridgway, Ibis, 1884, pp. 27 & 28, pl. ii.

Pachyrhamphus griseigularis (♂) from M. Roraima, B. Guiana ; Godman & Salvin, *t. c.* p. 448. *P. versicolor* from Ecuador differs from examples from Bogota and Antioquia, and is perhaps a local race ; v. Berlepsch & Taczanowski, P. Z. S. 1884, p. 298.

Pipreola whitelyi, sp. n. (♀), M. Roraima, B. Guiana ; Godman & Salvin, Ibis, 1884, p. 449.

DENDROCOLAPTIDÆ.

Anabazenops ruficollis, sp. n., Paucal, Peru ; L. Taczanowski, Orn. du Pérou, ii. p. 160.

Automolus holostictus striatidorsus, Stolz., MS., from Ecuador, very near *A. holostictus* from Antioquia ; Sclater thinks them identical, but they may not be so ; v. Berlepsch & Taczanowski, P. Z. S. 1884, p. 299.

Philydor albigularis, sp. n., M. Roraima, B. Guiana ; Godman & Salvin, Ibis, 1884, p. 450.

Synallaxis adusta, sp. n., M. Roraima : *iid. ibid.* *S. demissa*, sp. n., M. Roraima ; *iid. ibid.* *S. frontalis*, Pelz., from Ecuador, is intermediate between *S. fruticicola* and *S. frontalis* of Peru ; v. Berlepsch & Taczanowski, P. Z. S. 1884, p. 298. *S. wyatti*, Scl. & Salv., from Ecuador, differs slightly from New Granada specimens ; *iid. t. c.* p. 299. *S. paucalensis*, sp. n., Paucal, Peru ; Taczanowski, Orn. du Pérou, ii. pp. 131 & 132.

FORMICARIIDÆ.

Dysithamnus tambillanus, sp. n., Tambillo, Peru ; Taczanowski, Orn. du Pérou, ii. pp. 30 & 31 [described as *D. semicinereus* by Tacz., P. Z. S. 1879, p. 232].

Grallaria regulus, Sel. & Salv., and *G. ruficapilla*, Lafr., from Ecuador, differ from specimens from Peru and Antioquia respectively in certain points; v. Berlepsch & Taczanowski, P. Z. S. 1884, p. 302. *G. simplex*, sp. n., M. Roraima, B. Guiana; Godman & Salvin, Ibis, 1884, p. 451.

Thamnophilus berlepschi, sp. n., from Huambo and Chirimoto, Peru; Taczanowski, Orn. du Pérou, ii. pp. 22-24 [described as *T. tenuipunctatus* by Tacz., P. Z. S. 1882, p. 29]. *T. insignis*, sp. n., M. Roraima; Godman & Salvin, Ibis, 1884, pp. 450 & 451. *T. nævius-albiventris*, sp. n., Guajango, Peru; Taczanowski, Orn. du Pérou, ii. pp. 9 & 10 [described as *T. nævius* by Tacz., P. Z. S. 1879, p. 232].

PICARIÆ.

PICIDÆ.

Picidæ, the structure and use of the tongue [see LUDWIG].

Campothera balia is a northern form of *Picus cailliaudi*; Sharpe, J. L. S. xvii. p. 431.

Colaptes mexicanus saturator, subsp. n., Washington Terr.; Ridgway, P. Biol. Soc. Wash. ii. p. 90.

Dendrocopus immaculatus, sp. n., Kamtschatka; Stejneger, t. c. p. 98. *D. purus*, sp. n. (perhaps only a race of *D. major*), Kamtschatka; id. Auk, i. p. 35.

Hypoxanthus rivolii brevirostris (Tacz.), from Ecuador, is intermediate between *H. rivolii* of Bogota and *H. brevirostris* of Peru, and is *H. æquatorialis*, Dubois; v. Berlepsch & Taczanowski, P. Z. S. 1884, p. 307.

Iyngipicus seebohmi prob. = *I. kisuki*; Seebohm, Ibis, 1884, p. 179.

Iynx pulchricollis, sp. n., Babira, E. Equat. Africa; Hartlaub, Ibis, 1884, pp. 28-30, pl. iii.

Mesopicus schoensis, from Zanzibar [fide Hargitt], is intermediate between *M. schoensis* (Rüpp.) and *M. namaquus*, it may be called *M. decipiens*; Sharpe, J. L. S. xvii. p. 430. *M. spodocephalus* and *M. goertan*, their differences, with a description of the former; Hargitt, Ibis, 1884, pp. 199-202.

Miglyptes grammithorax, *M. tristis*, *M. tukki*, *M. jugularis*, their synonymy and characters; id. t. c. pp. 189-199.

Picoides tridactylus alascensis, subsp. n., from N. America, diagnosed; E. W. Nelson, Auk, i. pp. 165 & 166.

Picumnus jheringi, sp. n., Taquara do Mundo novo, N. of Rio Grande do Sul; v. Berlepsch, Ibis, 1884, pp. 441 & 442. *P. laurencii*, Cory, = *P. micromegas*, Sund.; Tristram, t. c. pp. 167 & 168.

Picus major palzami is a Caucasian form of *P. major*; Seebohm, P. Z. S. 1884, p. 409. *P. mombasicus*, sp. n., near *P. abingoni*, E. Africa; Fischer & Reichenow, J. f. O. 1884, pp. 262 & 263. *P. rhodeogaster*, sp. n., near *P. spodocephalus*, Massailand; id. t. c. p. 180.

Thriponax hargitti, sp. n., Palawan, Philippine Archipelago (wrongly referred in 1876 to *T. javanicus*); Sharpe, Ibis, 1884, p. 317, pl. viii.

TROCHILIDÆ.

Amazilia cupreicauda, sp. n., M. Roraima, B. Guiana; Godman & Salvin, Ibis, 1884, p. 452.

Chlorostilbon stuebeli, sp. n., from Bolivia; Meyer, Z. Ges. Orn. 1884, pp. 206 & 207.

Clytolama rubinea, skeleton figured; *id.* Abbild. Vogel-skel. p. 46, pl. lxiii.

Diphlogæna hesperus, difference of ♂ and ♀; v. Berlepsch & Taczanowski, P. Z. S. 1884, pp. 303 & 304.

Lesbia amaryllis (Bourc.), from Ecuador, is possibly a local race of the species; *id.* t. c. p. 305.

"*Leucippus viridicauda*, Berlepsch, MS.," Huiro, Peru; Taczanowski, Orn. du Pérou, i. pp. 399 & 400.

Lophornis sp. ? from Quito; Meyer, Z. Ges. Orn. 1884, p. 205.

Orypogon stuebeli, sp. n., Colombia; *id.* t. c. p. 204.

Petasophora germana, sp. n., M. Roraima, B. Guiana; Godman & Salvin, Ibis, 1884, pp. 451 & 452.

Phaethornis aphaes, sp. n. [*Pygmornis griseigularis*, Cab. & Heine, Mus. Hein. iii. p. 8 (*nec* Bonap., *ex* Gould)]; F. Heine, Jun., J. f. O. 1884, p. 235 [a similar mistake occurs in J. f. O. 1863, p. 176, where the true *P. griseigularis* stands as *P. amaura*]. *P. superciliosus*, skeleton figured; Meyer, Abbild. Vogel-skel. p. 46, pl. lxiii.

Selasphorus torridus is not identical with *S. flammula*; Ridgway, P. U. S. Nat. Mus. vii. p. 14.

CYPSELIDÆ.

Chætura yucatanica, sp. n. ?, Silam, Yucatan; Lawrence, Ann. N. York Ac. iii. pp. 156 & 157.

Collocalia fuciphaga from S.E. Borneo, its nest; Blasius, J. f. O. 1884, p. 217 [see also PRYER, H.]. *C. linchi*, its eggs (very like others of the same genus) from S.E. Borneo; Kutter, t. c. p. 227.

CAPRIMULGIDÆ.

Ægotheles wallacii, its egg figured, &c.; Meyer, Z. Ges. Orn. 1884, p. 278, pl. xvii. fig. 4.

Batrachostomus cornutus, with the young in down, from S.E. Born. Blasius, J. f. O. 1884, p. 217.

Caprimulgus faberi, sp. n., from W. Sumatra; Meyer, SB. Ges. I. 1884, pp. 20 & 21. *C. frenatus*, sp. n., Shoa, N.E. Africa; Salvadori, Ann. Mus. Genov. 1884, p. 118.

Lurocalis rufiventris, sp. n., Tambillo, Peru; Taczanowski, Orn. du Pérou, i. p. 209 (*L. nattereri*, Tacz., P. Z. S. 1879, p. 240): ♂ and ♀ from Ecuador compared; v. Berlepsch & Taczanowski, P. Z. S. 1884, p. 306.

COLIIDÆ.

The family, *sub voce* "Mouse-bird"; A. Newton, Encycl. Brit. Ed. 9, xvii., with figs.

Colius erythromelon and *C. nigricollis* in Zool. Gardens; Sclater, P. Z. S. 1884, pp. 475 & 530, pl. xlv. figs. 1, 2, & 3.

ALCEDINIDÆ.

Alcedo euryzona (3rd ex. of sp.), from S.E. Borneo; Blasius, J. f. O. 1884, p. 217. *A. ispidioides*, its skeleton figured; Meyer, Abbild. Vogel-skel. p. 45, pl. lxiii.

Ceryle alcyon, its osteology, with a discussion of the affinities of *Alcedinidæ*; Shufeldt, J. Anat. Phys. xviii. pt. 3, pp. 279-294, pl. xiv. and woodcut in text. *C. superciliosa strictptera*, subsp. n., from Yucatan; Ridgway, P. Biol. Soc. Wash. ii. pp. 95 & 96.

Ceyx cyanopectus and *C. philippensis* are probably the two sexes of the same species; R. G. Wardlaw-Ramsay, Ibis, 1884, pp. 332 & 333, pl. ix.

Dacelo leachi, *D. cervinus*, *D. occidentalis*, discussed; Sharpe, Rep. Voy. 'Alert,' pp. 21-24.

Halcyon sanctus in Timor-Laut; H. O. Forbes, P. Z. S. 1884, p. 426.

Sauromarptis gaudichaudii var., Aru; Meyer, Z. Ges. Orn. 1884, pp. 276 & 277.

Sauropatis australasie var. *minor*, Meyer, var. n., Timor-Laut; *id. t. c.* p. 196.

Sauropatis sancta, *id.* SB. Ges. Isis, 1884, p. 19 [see *Halcyon* (Forbes)].

BUCEROTIDÆ.

DUBOIS, A. A Critical Review of the Family. Bull. Mus. Belg. iii. 1884, p. 18.

Aceros nepalensis in Zool. Gardens; Sclater, P. Z. S. 1884, p. 251.

Bucorax pyrrhops distinguished from *B. abyssinicus*; J. A. De Souza, J. Sci. Lisb. xxxviii. 1884, pp. 118-120 (pl., 2 figs. of head).

MEROPIDÆ.

DRESSER, H. E. A Monograph of the *Meropidæ*, or Family of the Bee-eaters. London: 1884, pts. i.-iii. pp. 1-106 (20 pls., unnumbered).

The species given, which are all figured, are *Nyctiornis amictus* and *N. athertoni*, *Meropogon forsteni*, *Merops breweri*, *M. sumatranus*, *M. bicolor*, *M. viridis*, *M. cyanophrys*, *M. boehmi*, *M. albicollis*, *M. ornatus*, *M. philippinus*, *M. persicus*, *M. superciliosus*, *M. apiaster*, *M. malimbicus*, *M. nubicus*, *M. nubicoides*, *Dicrocercus hirundineus*, *Melittophagus lafresnayei*.

Melittophagus boehmi = *Merops dresseri*: it is rather of the genus *Melittophagus* than *Merops*, though almost intermediate; Reichenow, J. f. O. 1884, p. 236.

Merops ornatus, Lath. (& var. *sumbaensis*, var. n.), from Sangi and Sumba; Meyer, SB. Ges. Isis, 1884, p. 19.

MOMOTIDÆ.

The family, *sub voce* "Motmot"; A. Newton, Encycl. Brit. Ed. 9, xvii.

CORACIDÆ.

Eurystomus pacificus in Timor-Laut; H. O. Forbes, P. Z. S. 1884, p. 426.

TROGONIDÆ.

Hapaloderma narina, Marungu, Central Africa; R. Böhm, Z. Ges. Orn. 1884, pp. 110 & 111.

CAPITONIDÆ.

Barbatula simplex, sp. n., Massailand; Fischer & Reichenow, J. f. O. 1884, p. 180.

Trachyphonus boehmei, sp. n., near *T. squamiceps*, Massailand; *id.* t. c. pp. 179 & 180. *T. purpuratus*? in Zool. Gardens; Selater, P. Z. S. 1884, p. 476.

CUCULIDÆ.

Centrococcyx javanensis, its eggs from S.E. Borneo, very like those of the genus *Centropus*; Kutter, J. f. O. 1884, pp. 226 & 227.

Ceuthmochares intermedius, sp. n., near *C. flavirostris* and *C. australis*, Equat. Africa; Sharpe, J. L. S. xvii. p. 432.

Chrysococcyx lucidus new to Norfolk I.; Layard, Ibis, 1884, p. 123.

Coccyzus americanus shot near Turin; E. C. Taylor, t. c. pp. 115 & 214.

Guira piririgua, its eggs described from the Lower Uruguay; W. B. Barrows, Auk, i. pp. 26 & 27.

MUSOPHAGIDÆ.

Corythaix hartlaubi, sp. n., from Massailand; Fischer & Reichenow, J. f. O. 1884, pp. 52 & 53. *C. livingstonii*, Marungu, Central Africa; Böhm, Z. Ges. Orn. 1884, p. 110.

Musophaga boehmei, sp. n., [?] Marungu, Central Africa; Schalow, t. c. pp. 103-105; R. Böhm, t. c. pp. 108-111, pl. vi.

PSITTACI.

GREENE, W. T. Parrots in Captivity. Pts. VII.-XVIII. (completing the work). [Cf. Zool. Rec. xx. *Aves*, p. 38.]

Skeletons of Parrots figured; A. B. Meyer, Abbild. Vogel-skel. pp. 46-48: viz., *Androglossa auripalliatu* (pl. lxiv.), *Psittacus erithacus*

(pl. lxxv.), *Aprosmictus dorsalis* (pl. lxvi.), *Prioniturus platurus* (pl. lxvii.), *Lorius cyanauchen* (pl. lxviii.), *Lorius lory* (pl. lxix.), *Trichoglossus ornatus* (pl. lxx.).

Brotoperys panychlorus of Salv. & God. is wrongly included in this genus, it should be *Psittacula panychlora*; Reichenow, J. f. O. 1884, pp. 234 & 235.

Cacatua philippinarum from Sooloo Is.; Selater, P. Z. S. 1884, p. 251.

Chalcopsittacus duivenbodii, sp. n., New Guinea; A. Dubois, Bull. Mus. Belg. iii. 1884, p. 109.

Chrysotis erythrura in Zool. Gardens; Selater, P. Z. S. 1884, p. 562 [see *op. cit.* 1880, p. 23, pl. ii.].

Conurus solstitialis, its reproduction in France; H. Gadeau de Kerville, Bull. Soc. Acclim. 1884, pp. 615 & 616.

Coracopsis vasa, a singular habit; Selater, P. Z. S. 1884, pp. 410 & 562.

Eclectus roratus, P. L. S. Müll., ♀ pull., = *E. grandis*, auct.; Meyer, Z. Ges. Orn. 1884, p. 274, pl. xvi.

Eos cyanogenys, Bp., skeleton figured; t. c. p. 398, pl. xiii.

Geffroyus timorlaeensis, sp. n., from Tenimber and Timor-Laut; Meyer, SB. Ges. Isis, 1884, pp. 15 & 16: it is identical with *G. keyensis*; H. O. Forbes, P. Z. S. 1884, pp. 426 & 427: the contrary view; Salvadori, t. c. p. 578.

Nestor, the genus; A. Newton, Encyl. Brit. Ed. 9, xvii.

Nestor notabilis attacking sheep; T. H. Potts, MT. orn. Ver. Wien, 1884, p. 168; Ibis, 1884, pp. 471 & 472 [see BULLER, W. L.]. *N. productus*, supposed egg, Nepean I., Norfolk I.; Layard, Ibis, 1884, p. 123.

Pionias crassus, sp. n., near *P. fuscicapillus*, Equat. Africa; Sharpe, J. L. S. xvii. pp. 429 & 430. *P. lacerus*, sp. n., near *P. flavirostris*; *P. reichenowi*, sp. n., near *P. menstruus*, probably from N. Brazil; F. Heine, J. f. O. 1884, pp. 264 & 265.

Platycercus alpinus [see BULLER, W. L.].

Poocephalus massaicus, sp. n., near *guelmelii*, Massailand; Fischer & Reichenow, J. f. O. 1884, p. 179.

Psittacula diophthalmica from Waigiou; Nehrkorn, Ibis, 1884, p. 467.

Psittacus galeritus, its reproduction; Dudlitz, Bull. Soc. Acclim. 1884, pp. 438-440. *P. rubrovarius* differs from *P. erythacus*; A. T. de Roche-brune, Act. Soc. L. Bord. viii. pp. 167 & 168.

Trichoglossus meyeri, Wald., var. *bonthainensis*, Meyer, var. n. from Bonthain, S. Celebes; Meyer, SB. Ges. Isis, 1884, p. 16.

STRIGES.

Bubo blakistoni [cf. Zool. Rec. xx. Aves, p. 19]; Seebohm, Ibis, 1884, pp. 42 & 183, pl. vi. *B. nigrescens*, sp. n., from Ecuador, very near *B. virginianus*, but darker above and below, &c.; v. Berlepsch & Taczanowski, P. Z. S. 1884, pp. 309 & 310. *B. orientalis* from S.E. Borneo; Blasius, J. f. O. 1884, p. 216.

Huhua nipalensis, its geographical distribution; remarks on it and some allied species; J. H. Gurney, P. Z. S. 1884, pp. 558-561, pl. lii. [cf. P. Z. S. 1878, p. 790].

Ninox scutulata, *N. affinis*, *N. lugubris*, *N. burmanica*, *N. obscura*, *N. theomacha*, *N. dimorpha*; J. H. Gurney, Ibis, 1884, pp. 169-173. *N. scutulata*?; Meyer, SB. Ges. Isis, 1884, p. 14. *N. peninsularis* distinguished from *N. connivens*; Sharpe, Rep. Voy. 'Alert,' pp. 11 & 12. *N. theomacha*, ♂ = *N. goldiei* ♀, = *N. terricolor*; id. J. L. S. xvii. pp. 407 & 408.

Sceloglaux albifacies, its habits, food, and nidification; W. W. Smith, N. Z. J. Sci. pp. 86-88 [see also BULLER, W. L.].

Scops nicobaricus; J. H. Gurney, Ibis, 1884, p. 172.

Surnia ulula, not *S. funerea*, is the correct name of the American Hawk Owl, = *S. canadensis* (Briss.); Stejneger, Auk, i. pp. 362 & 363.

Syrnium bohdorffi, sp. n., near *S. nuchale*, Equat. Africa; Sharpe, J. L. S. xvii. pp. 439 & 440. *S. uralense* nesting in E. Prussia; Altum, J. f. O. 1884, pp. 267-271.

ACCIPITRES.

CATHARTIDÆ.

Cathartes urubutinga new to Venezuela; v. Berlepsch, Ibis, 1884, pp. 437 & 438.

FALCONIDÆ.

Antenor uncinatus new to Venezuela; v. Berlepsch, Ibis, 1884, pp. 436 & 437.

Aquila boliviara, sp. n.?; E. v. Boeck, MT. orn. Ver. Wien, 1884, pp. 101 & 102. *A. chrysaetos*, *A. fulva*, *A. nobilis*, are three forms of the Golden Eagle from Russia; Menzbier, Ibis, 1884, pp. 299-301. *A. imperialis* and *A. naevia* [a correction]; Brooks, t. c. pp. 236 & 237. *A. (Nisaetus) morphnoides* in N. S. Wales; J. H. Gurney, t. c. p. 465. *A. orientalis*, *A. glitschii*, and *A. bifasciata* are three forms of the Steppe Eagle from Russia; Menzbier, t. c. pp. 303-305. *A. pennata* interbreeds with *A. minuta*; id. t. c. p. 308.

Archibuteo atricapillus of former list = young of *A. candidissimus*; remarks on *A. candidissimus* and *A. ferrugineus*; Dybowski & Taczanowski, Bull. Soc. Z. Fr. 1884, pp. 147-150 & 161. *A. lagopus* breeding in Austro-Hungary and especially in S. Hungary; A. v. Mojsisovics, Z. Ges. Orn. 1884, pp. 237-242 [see *Buteo*].

Astur atricapillus hawshawi, subsp. n., from N. America; E. W. Nelson, Auk, i. pp. 165 & 166: cancelled in favour of *A. a. striatulus*; Ridgway, t. c. pp. 252 & 253.

Buteo cooperi possibly identical with *B. harlani*; Ridgway, t. c. pp. 253 & 254. *B. lineatus alleni*, subsp. n., from Florida, ♂ and juv. described; id. P. U. S. Nat. Mus. vii. pp. 514 & 515. *B. pennsylvanicus*, its nest and eggs described from St. John, N.B.; Banks, Auk, i. p. 95. *B. vulgaris*, *B. vulpinus* (*desertorum*, auct.), in Russia; Menzbier, Ibis, 1884, pp. 296-298.

Circaetus cinereus is distinct from *C. pectoralis*; J. H. Gurney, *t. c.* p. 218.

Circus cyaneus [?] breeding in Dorset; J. C. Mansel-Pleydell, *Zool.* 1884, pp. 340 & 341. *C. melanoleucus* certainly occurs in the Philippine Is.; R. G. Wardlaw-Ramsay, *Ibis*, 1884, p. 330.

Erythrotriorchis doriae = *Megatriorchis doriae*, Salvad. & D'Alb., the type (young ♀) and the adult described; Sharpe, *J. L. S.* xvii. pp. 405-407.

Falco atriceps, 2 species included under this name; Brooks, *Ibis*, 1884, pp. 238 & 239. *F. candicans* in Donegal; More, *Zool.* 1884, pp. 31 & 115. *F. leucogenys*, adult and young described at length; Menzbier, *Ibis*, 1884, pp. 285-288. *F. melanogenys* certainly occurs in the Philippine Is.; R. G. Wardlaw-Ramsay, *t. c.* p. 330. *F. peregrinus* vars. *griseiventris*, *cornicum*, *brevirostris*; Menzbier, *t. c.* pp. 280-285. *F. puniceus* new to Italy; Salvadori, *Atti Ac. Tor.* xix. pp. 343-347: figured (juv.) [see MARTORELLI, G.]. *F. ruficollis*, description of young; Sharpe, *J. L. S.* xvii. p. 438. *F. sparverius* shot in Yorkshire; Seebohm, *P. Z. S.* 1884, p. 45.

Gypocittinia melanosternon in N. S. Wales; J. H. Gurney, *Ibis*, 1884, p. 465.

Gyps fulvus in its breeding quarters; Chapman, *t. c.* p. 68.

Haliaeetus pelagicus from Kamtschatka: Seebohm, *P. Z. S.* 1884, p. 409.

Hieracidea novæ-zealandiæ and *H. brunnea* are distinct species; W. W. Smith, *Tr. N. Z. Inst.* 1883, pp. 318-322. [See *N. Z. J. Sci.*, March, 1884, pp. 84 & 85.]

Hierofalco gyrfalco, obtained in Sussex in 1851, wrongly identified as *H. islandus*; J. H. Gurney, *Zool.* 1884, p. 271. *H. candicans* in Skye; H. A. Macpherson, *t. c.* p. 382. [See *Falco*.]

Hypotriorchis cuvieri found North of the Equator (Shoa); Salvadori, *Ann. Mus. Genov.* 1884, p. 26.

Machæramphus alcinus a resident in S.E. Borneo; W. Blasius, *J. f. O.* 1884, p. 216.

Melierax polyzonus, Rüpp., = *M. mechowii*?; Sharpe, *J. L. S.* xvii. p. 437.

Micrastur guerilla, from Ecuador, may be *M. pelzelni* of Ridgway; v. Berlepsch & Taczanowski, *P. Z. S.* 1884, pp. 310 & 311.

Milvus govinda, the specific name criticised; Brooks, *Ibis*, 1884, pp. 238 & 239.

Nisaetus spilogaster is the correct determination of *Aquila bonellii*? from Senegal [Hartl., *Orn. W. Afr.* p. 3], and not *N. fasciatus*; A. T. de Rochebrune, *Act. Soc. L. Bord.* viii. p. 131.

Pernis apivorus, not *P. ptilorhynchus*, is probably the species which inhabits Japan; J. H. Gurney, *Ibis*, 1884, pp. 275-277.

Polyboroides typicus in *Zool. Gardens*; Selater, *P. Z. S.* 1884, p. 251.

Polyborus tharus, description of nest and eggs from Concepcion; Barrows, *Auk*, i. pp. 111-113.

Rostrhamus sociabilis plumbeus, description of its nest, eggs, and breeding habits; Bailey, *t. c.* p. 95.

Rupornis ridgwayi, ♂ ♀ re-described; the immature male resembles *Buteo pennsylvanicus*; Cory, *t. c.* p. 4.

Spilornis asturinus, sp. n., loc. incert.; Meyer, SB.-Ges. Isis, 1884 p. 13.

Spizaetus coronatus has the plumage bright in the old birds, and dull in the young, as Smith asserted (*nec* Gurney); A. T. de Rochebrune, Act. Soc. L. Bord. viii. p. 133. *S. linnaetus* from S.E. Borneo; W. Blasius, J. f. O. 1884, p. 216.

Tinnunculus arthuri, sp. n., Mombasa; J. H. Gurney, List Di. Birds Prey (append.). *T. pekinensis* in Transvaal; *id.* Ibis, 1884, pp. 221 & 222.

Urospizias albiventris in Timor-Laut; H. O. Forbes, P. Z. S. 1884, p. 426: it perhaps differs from *U. albiventris* of Ké Is.; *id. t. c.* pp. 577 & 578: it is omitted from J. H. Gurney's "List of Diurnal Birds of Prey"; Salvadori, Ibis, 1884, p. 355. *U. approximans* (V. H.) var. *halmahera*, Meyer, var. n., from Halmahera, E. Ind. Archipelago; Meyer, SB. Ges. Isis, 1884, pp. 11 & 12. *Urospizias* sp. n.?; *id.* p. 10.

Urubitinga zonura new to Venezuela; H. v. Berlepsch, Ibis, 1884, p. 436.

STEGANOPODES.

PELECANIDÆ.

Pelecanus californicus, subsp. n., from Pacific Coast of America; Baird, Brewer, & Ridgway, N. A. Water Birds, ii. p. 143. *P. trachyrhynchus*, the deciduous knob of culmen of beak, with a note on the observations of American ornithologists; Selater, P. Z. S. 1884, p. 410.

Phalacrocorax, its occipital style; Jeffries, Auk, i. pp. 196 & 197. *P. africanus*? in Zool. Gardens; Selater, P. Z. S. 1884, p. 55. *P. dilophus albociliatus*, subsp. n., from Coast of California; Ridgway, P. Biol. Soc. Wash. ii. pp. 94 & 95; also Baird, Brewer, & Ridgway, N. A. Water Birds, ii. p. 150. *P. pelagicus robustus*, subsp. n., Coast of Alaska; *id. t. c.* p. 160. *P. violaceus* and *P. v. resplendens*, are they specifically distinct? [the question is answered in the affirmative in a note by Ridgway]; Goss, Auk, i. pp. 163-165.

Sula bassana, Irish breeding stations; Barrington, Zool. 1884, pp. 473-479; Ussher, *t. c.* pp. 479-482.

HERODIONES.

ARDEIDÆ.

Ardea bubulcus probably breeds on the Obedska Bara, Slavonia; W. E. Clarke, Ibis, 1884, pp. 135 & 136. *A. cocoi* new to Venezuela; H. v. Berlepsch, *t. c.* p. 438. *A. comata* added to the Persian lists; Seebohm, *t. c.* p. 429. *A. sibilatrix* new to Venezuela; H. v. Berlepsch, Ibis, 1884, pp. 438 & 439. *A. wardi*, sp. n., Oyster Bay, Florida; Baird, Brewer, & Ridgway,

N. A. Water Birds, i. pp. 10-13: its specific difference; Ward, Auk, i. pp. 161-163 [cf. Bull. Nutt. Orn. Club, vii. pp. 5 & 6].

Ardeiralla flavicollis from S.E. Borneo; W. Blasius, J. f. O. 1884, p. 219.

Ardeola prasinosceles new to Japan; Seebohm, Ibis, 1884, p. 35. *A. speciosa* from S.E. Borneo; W. Blasius, J. f. O. 1884, p. 219: its egg from S.E. Borneo, very like that of *A. grayi*; Kutter, t. c. pp. 224 & 225.

Ardetta cinnamomea from S.E. Borneo; W. Blasius, t. c. p. 219. *A. minuta* new to Norway; Collett, Förh. Selsk. Chr. 1883, No. 15.

Botaurus lentiginosus in Sussex; Borrer, Zool. 1884, p. 68.

Butorides schrenki, sp. n., Amoor-land and Ussuria; Bogdanow, Consp. Av. Imp. Ross. p. 115.

Herodias nigripes from S.E. Borneo; W. Blasius, J. f. O. 1884, p. 219.

Nycticorax gardeni new to Venezuela; H. v. Berlepsch, Ibis, 1884, p. 439.

Tigrisoma brasiliense new to Venezuela; *id. ibid.*

CICONIIDÆ.

Ciconia alba at Pevensay; Nelson, Zool. 1884, p. 489. *C. nigra* in Kent; Prentis, t. c. pp. 429 & 430.

Leptoptilos = Κελας of Greek authors; V. Ball, Rep. Brit. Ass. 1884, p. 762.

Scopus umbretta, Ciconiine or Ardeine? [see BEDDARD, F. E.]: its habits wrongly described by various authors; A. T. de Rochebrune, Act. Soc. L. Bord. viii. pp. 383-387.

Tantalus loculator new to Venezuela; H. v. Berlepsch, Ibis, 1884, p. 439.

PLATALÆIDÆ.

Eudocimus ruber and *E. albus*, their close relationship; Ridgway, Auk, i. pp. 239 & 240.

Platalæa ajaja new to San Domingo; Tristram, Ibis, 1884, p. 168. *P. leucorodia* and *Plegadis falcinellus* breeding on the Obedska Bara, Slavonia; W. E. Clarke, t. c. pp. 134 & 135.

ODONTOGLOSSÆ.

PHENICOPTERIDÆ.

Phenicopterus antiquorum, account of breeding station on the Guadalquivir, Spain; Chapman, Ibis, 1884, pp. 71, 72, & 87-89, pl. iv.: occurrence in Hampshire; Lord H. Scott, Zool. 1884, pp. 338 & 339.

ANSERES.

ANATIDÆ.

Æx sponsa in Styria; V. Tschusi zu Schmidhoffen, MT. orn. Ver. Wien, 1884, p. 30.

Anas boscas, unusual colouring; Schiavuzzi, MT. orn. Ver. Wien, 1884, p. 38: hybrid with *A. obscura*; Slade, P. U. S. Nat. Mus. vii. p. 66. *A. capensis*, from Shoa, = *A. larvata*, Cuv.; it probably is not *A. assimilis*, Forst. (which may be *A. guttata*, Licht., = *A. sparsa*, Smith); nor is it *Querquedula* (scr. *Rhynchaspis*) *capensis*, Smith, Ill. Zool. S. Afr. pl. xcvi. ; Salvadori, P. Z. S. 1884, pp. 172-175 [a note by Sclater says that Forster's original drawing shows *A. capensis* to be *A. assimilis*]. *A. caryophyllacea*, a description of its haunts in Bengal; Simson, Ibis, 1884, pp. 271-275. *A. navosa* new to Tasmania; Morton, t. c. p. 472.

Anser albatrus, Cassin, = *A. hyperboreus*, Pallas; *Chen hyperboreus nivalis*, name proposed for the larger race; Ridgway, P. Biol. Soc. Wash. ii. pp. 107 & 108. *A. indicus* breeding at Sat-scheu and Kuku-noor, Tibet; Przewalski, Reisen in Tibet, pp. 64 & 226.

Bernicla brenta nigricans in Massachusetts; Cory, Auk, i. p. 96. *B. nigricans* in Japan; Seebohm, Ibis, 1884, p. 175. *B. canadensis*; Howley, Auk, i. pp. 309-313.

Chen caerulescens, from Alaska, in Zool. Gardens; Sclater, P. Z. S. 1884, p. 476.

Clangula glaucion, sub voce "Morillon"; A. Newton, Encycl. Brit. Ed. 9, xvi.

Cygnus bewicki and *C. olor* in the Lena Delta; Bunge, Mém. Biol. 1884, pp. 45-47. *C. nigricollis*: 2 cygnets stated to be hatched from one egg; A. C. le Souef, P. Z. S. 1884, p. 390.

Dendrocygna arcuata of Cuv. = *D. vagans* of Blasius, Ver. f. Naturw. Brauns., 1883, = *D. arcuata* of Salv., Orn. d. Papuas; W. Blasius, J. f. O. 1884, pp. 219 & 220 [specimen from S.E. Borneo].

Erismatura leucocephala, new to Persia; Seebohm, Ibis, 1884, p. 429. *E. muccoa* from the Shoa district (north of the equator); Salvadori, Ann. Mus. Genov. 1884, p. 26.

Fuligula brunnea from the Shoa district (north of the equator); Salvadori, Ann. Mus. Genov. 1884, p. 26.

Hymenolemus malacorhynchus in Zool. Gardens; Sclater, P. Z. S. 1884, p. 389.

Melanetta fusca, 2nd occurrence in America, comparison with *M. velutina*; Ridgway, P. U. S. Nat. Mus. vii. p. 68.

Merganetta armata, its habits; Crawford, Across the Pampas and Andes, pp. 235 & 236.

Mergus merganser in Bosnia, its habits; E. v. Dabrowski, MT. orn. Ver. Wien, 1884, pp. 84 & 85.

Nettapus coromandelianus, a correction of David & Oustalet's description; Seebohm, Ibis, 1884, p. 270: g. & sp. new to Borneo; W. Blasius, J. f. O. 1884, pp. 220 & 221.

Oedemia perspicillata in Lancashire; Thompson, Zool. 1884, p. 29.

Plectropterus scioanus, sp. n.?, Shoa, N.E. Africa; Salvadori, Ann. Mus. Genov. 1884, pp. 25 & 26.

Querquedula capensis, Shoa district (north of the equator); *id.* t. c. p. 26.

Somateria mollissima shot near Pilsen; Fritsch, MT. orn. Ver. Wien, 1884, p. 31.

COLUMBÆ.

COLUMBIDÆ.

Carpophaga aenea, skeleton figured; Meyer, Abbild. von Vogel-skel. p. 44, pl. lviii. *C. pinon* var. *rubensis*, Meyer, var. n. from New Guinea; *id.* SB. Ges. Isis, 1884, pp. 51 & 52.

Columba intermedia? reported from Karataou and Tian-chan, *C. risoria*? from the Delta of the Danube, *C. aegyptiaca*, Lath., and *C. maculicollis*? Wagl., in Transcaucasia; Bogdanow, Consp. Av. Imp. Ross. pt. i. p. 11. *C. tabellaria*, *C. tympanizans*, *C. brevicauda*, skeletons figured; Meyer, Abbild. von Vogel-skel. pp. 44 & 45, pls. lx.-lxii.

Engyptila gaumeri, sp. n.?, from Silam, Yucatan; Lawrence, Ann. N. York Ac. iii. pp. 157 & 158. *E. wellsii*, sp. n., from I. of Grenada, W. Indies, unlike any others of the genus in colour; *id.* Auk. i. pp. 180 & 181.

Goura coronata, *G. victoria*, skeletons (fig.); Meyer, Abbild. Vogel-skel. pp. 43 & 44, pls. lvi. & lvii. *G. scheepmakeri*; Salvadori, Ibis, 1884, p. 355.

Macropygia sp.?, from Aru, *M. timorlaensis*, sp. n., from Timor-Laut; Meyer, Z. Ges. Orn. 1884, pp. 214 & 215.

Ptilopus flavovirescens, sp. n., from Tenimber and Timor-Laut; Meyer, SB. Ges. Isis, 1884, p. 50: it is identical with *P. xanthogaster* (Wagl.); H. O. Forbes, P. Z. S. 1884, pp. 430 & 431: a contrary view; Salvadori, t. c. p. 580. *P. strophium*, an sp. n.?, Meyer, SB. Ges. Isis, 1884, p. 51.

Treron schalowi omitted from Shelley's monograph of the *Columbidæ* of the Ethiopian region; Schalow, J. f. O. 1884, p. 232.

Turtur coppingeri, sp. n., Glorioso Is., Western Indian Ocean, near *T. aldabranus*; Sharpe, Rep. Voy. 'Alert,' p. 484. *T. perspicillata*, sp. n., near *T. decipiens*, Massailand; Fischer & Reichenow, J. f. O. 1884, p. 179.

Zenaida ruficauda, Bp., or *Z. vinaceorufa*, Ridg., sp. n.?, ♀ fully described from I. of Curaçoa, Venezuela; Ridgway, P. U. S. Nat. Mus. vii. pp. 176 & 177. *Z. yucatanensis*, specific differences from *Z. carolinensis* and *Z. amabilis*, it is probably a hybrid; *id.* Auk, i. p. 96.

DIDUNCULIDÆ.

Didunculus strigirostris, skeleton figured; Meyer, Abbild. von Vogel-skel. pp. 42 & 43, pl. lv.

PTEROCLIDÆ.

"*Attagen*" of the ancients supposed to be a *Pterocles*; Harting, Zool. 1884, pp. 31 & 32.

Pterocles alchata, its summer plumage; Chapman, Ibis, 1884, p. 84.
Syrnhaptis paradoxus in Bosnia; E. v. Dabrowski, MT. orn. Ver. Wien, 1884, p. 140.

GALLINÆ.

TETRAONIDÆ.

L. STEJNEGER. On the shedding of the claws in the Ptarmigan and allied Birds. Am. Nat. 1884, pp. 774-776. [The instances given are 1884. [VOL. XXI.]

Bonasa bonasia, *Tetrao urogallus*, *Lyrurus tetrix*, *Lagopus ridgwayi*, *L. albus*, and *Coturnix coturnix*.]

Attagen, Kaup. [= *Lagopus* ?], a review of the group; *Lagopus ridgwayi* (pl. v.); Stejneger, Z. Ges. Orn. 1884, pp. 86-92.

Coturnix ussuriensis, sp. n. ?, from Ussuria and Dauria; Bogdanow, Consp. Av. Imp. Ross. pp. 45-48.

Lagopus albus alleni, subsp. n.; Stejneger, Auk, i. p. 369. *L. albus* and *L. alpinus*; *id.* t. c. pp. 225-227. *L. leucurus*, moulting of its toe-nails; Drew, t. c. pp. 392 & 393. *L. ridgwayi*, sp. n., Commander Is.; Stejneger, P. Biol. Soc. Wash. ii. pp. 98 & 99 [see also *Attagen*]. *L. rupestris*, Gm., subsp. n. *insularis*, from Bering I.; Bogdanow, Consp. Av. Imp. Ross. pp. 34 & 35 [it is the same as *L. ridgwayi*, Stej.; *edd.*, Ibis, 1885, p. 224]. *L. rupestris*, *L. rupestris nelsoni*, subsp. n.; Stejneger, Auk, i. pp. 226-228.

Tetrao griseiventris [cf. Zool. Rec. xvii. *Aves*, p. 45]; Seebohm, Ibis, 1884, pp. 430 & 431, pl. xi.; *id.* P. Z. S. 1884, p. 409. *T. himalayensis* described from the Jard. d'Acclim. de Paris; La Nature, 1884, 2^{me} Semestre, pp. 342-344. *T. intermedius* killed in Saxony; Meyer, MT. orn. Ver. Wien, 1884, pp. 19-21: first occurrence in Sleswig; F., t. c. pp. 49 & 50: occurrence in Moravia; Talsky, t. c. pp. 183 & 184: rearing [with plate of four days' old bird]; V. Tschusi zu Schmidhoffen, t. c. p. 172: skeleton figured; Meyer, Abbild. von Vogel-skel. p. 41, pl. li. *T. mlokoziwiczii* [cf. Zool. Rec. xii. *Aves*, p. 85]; Seebohm, P. Z. S. 1884, p. 409: ♀ and juv. figured; Radde, Orn. Caucasica, pp. 358-364, pl. xxiii. *T. tetrix*, to rear in confinement difficult; Goetz, MT. orn. Ver. Wien, 1884, pp. 37 & 38. *T. urogalloides* var. n. *sachalinensis* from I. of Sagalien; Bogdanow, Consp. Av. Imp. Ross. p. 122. *T. urogallus*, skeleton figured; Meyer, Abbild. von Vogel-skel. p. 41, pl. lii.

PHASIANIDÆ.

Cerionis blythi, its egg; Slater, P. Z. S. 1884, p. 477.

Crossoptilon auritum, *C. mantschuricum*, *C. thibetanum*, *C. drouyni*, their distribution in Tibet, the two latter possibly identical, description of the former and of method of capture; N. Przewalski, Reisen in Tibet, pp. 204 & 205.

Francolinus altumi, sp. n., near *F. rueppelli*, from Massailand; Fischer & Reichenow, J. f. O. 1884, p. 179, pl. ii. *F. leucoparæus* (♀), sp. n., near *F. (Pternistes) nudicollis*, from E. Africa; *id.* t. c. p. 263. *F. rubricollis*, Rüpp., and *F. kirki*, H. & F., in Zool. Gardens; Slater, P. Z. S. 1884, p. 389.

Lophophorus chambanus, sp. n., Chamba, N.W. Himalayas; C. H. T. Marshall, Ibis, 1884, pp. 421 & 422.

Lophortyx californicus brunescens, subsp. n., from N. California. Ridgway, P. Biol. Soc. Wash. ii. p. 94.

Numida coronata marungensis, subsp. n., Marungu, Central Africa; Schalow, Z. Ges. Orn. 1884, p. 105. *N. vulturina* hatched in Lancashire; Slater, P. Z. S. 1884, p. 477.

Pediæcetes phasianellus campestris, subsp. n., from Montana and E. of Rocky Mts.; Ridgway, P. Biol. Soc. Wash. ii. p. 93.

Phasianus satscheunensis, *P. tarimensis*, *P. strauchi*, *P. vlangali*, spp. n., from Sa-tscheu, Tarim, Gan-su, and Zaidam, Tibet (respectively); Przewalski, Reisen in Tibet, p. 59.

Phasidus niger not correctly described hitherto; A. T. de Rochebrune, Act. Soc. L. Bord. viii. p. 356.

CRACIDÆ.

Chamapetes goudoti (Less.) of Ecuador is variable, and perhaps in part = *C. tschudii*, Tacz.; Berlepsch & Taczanowski, P. Z. S. 1884, p. 312.

MEGAPODIIDÆ.

Catheturus [= *Tallegalla*] *lathamii*, a record of the hatching of four young at the Jardin des Plantes, with remarks on the young birds; Huet, Bull. Soc. Acclim. 1883, pp. 611 & 612.

Megapodius duperreyi = *M. tumulus* = *M. assimilis*; Sharpe, Rep. Voy. 'Alert,' p. 26.

OPISTHOCOMI.

OPISTHOCOMIDÆ.

Opisthocomus cristatus from Venezuela; v. Berlepsch, Ibis, 1884, p. 440.

FULICARIÆ.

RALLIDÆ.

Crex lugens, sp. n., from Central Africa; Böhm, J. f. O. 1884, p. 176.

Eulabeornis castaneiventris, its egg figured, &c.; Meyer, Z. Ges. Orn. 1884, pp. 294 & 295, pl. xvii. fig. 3.

Fulica caribæa, sp. n., near *F. americana*, from the Lesser Antilles; ♂ ♀ described; Ridgway, P. U. S. Nat. Mus. vii. p. 358.

Gallirex cristata new to Japan; Seeböhm, Ibis, 1884, p. 178.

Gallinula chloropus, its "hairy" variety is caused by the absence of the barbules; J. H. Gurney, jun., Tr. Norw. Soc. iii. pp. 581-587, pl. *G. frontata* new to Borneo; W. Blasius, J. f. O. 1884, p. 219: its egg from S.E. Borneo; Kutter, t. c. p. 225. *G. orientalis* from Borneo; W. Blasius, t. c. p. 218: its egg from S.E. Borneo; Kutter, t. c. p. 225.

Ocydromus, gen.; A. Newton, Encycl. Brit. Ed. 9, xvii.

Ortygometra cinerea, second certain occurrence in Borneo; W. Blasius, J. f. O. 1884, p. 218: it = *Zapornia quadristrigata* of Horsf., its egg is like that of *O. minuta* and *O. pygmaea*; Kutter, t. c. pp. 225 & 226.

Porphyrio indicus from Borneo; W. Blasius, t. c. p. 219: its egg from S.E. Borneo; Kutter, t. c. p. 225. *P. melanopterus* from Timor-Laut; H. O. Forbes, P. Z. S. 1884, p. 426.

Porzana jamaicensis, its nest and eggs from Connecticut; Clark, Auk, i. pp. 393 & 394. *P. maruetta*; E. Ziemer, J. f. O. 1884, pp. 184-188.

Rallus beldingi, sp. n., from La Paz and Espiritu Santo Is., Gulf of California; Baird, Brewer, & Ridgway, N. A. Water Birds, i. pp. 356 & 357.

ALECTORIDÆ.

ARAMIDÆ.

Aramus scolopaceus new to Venezuela; v. Berlepsch, Ibis, 1884, p. 440.

EURYPYGIDÆ.

Eurypyga helias new to Venezuela; v. Berlepsch, Ibis, 1884, p. 440.

GRUIDÆ.

Balearica regulorum, notes on its reproduction; E. Rodigas, Bull. Soc. Acclim. 1884, pp. 848-850.

Grus communis in Mayo; Ussher, Zool. 1884, p. 72.

PSOPHIIDÆ.

Psophia cantatrix (Boeck, in litt.), sp. n.?, from Bolivia, compared with other species of *Psophia*; W. Blasius, J. f. O. 1884, pp. 203-210.

OTIDIDÆ.

Houbara undulata, a corrected description of its eggs; A. T. de Rochebrune, Act. Soc. L. Bord. viii. p. 363.

Otis canicollis, *O. cristata*, from Shoa, N.E. Africa (north of Equator); Salvadori, Ann. Mus. Genov. 1884, p. 26. *O. tarda* in Spain, its habits; Chapman, Ibis, 1884, pp. 69 & 70. *O. tetraz*, inflation of the gular pouch in the breeding season; *id. t. c.* pp. 95 & 96: in Cork; Donovan, Zool. 1884, p. 69.

LIMICOLÆ.

ÆDICNEMIDÆ.

Ædicnemus dominicensis, ♂ ♀ described; Cory, Auk, i. pp. 4 & 5.

PARRIDÆ.

Hydralector gallinaceus, *Hydrophasianus chirurgus*, new to Borneo; W. Blasius, J. f. O. 1884, p. 219: the egg of the former from S.F. Borneo; Kutter, t. c. p. 226.

CHARADRIIDÆ.

Ægialitis cunonica and *Æ. minuta* are distinct species; Brooks, Ibis, 1884, pp. 237 & 238. *Æ. mechowii*, sp. n., between *Æ. marginata* and

Æ. venusta; Cabanis, J. f. O. 1884, pp. 437 & 438. *Æ. semipalmatus* new to San Domingo; Tristram, Ibis, 1884, p. 168.

Charadrius fulvus breeding in New Zealand; Robson, Tr. N. Z. Inst. 1883, p. 308; Buller, t. c. p. 318. *C. squatarola* breeding in the Lena-Delta; Bunge, Mël. Biol. 1884, pp. 48 & 49. *C. venustus*, sp. n., Massailand; Fischer & Reichenow, J. f. O. 1884, pp. 178 & 179.

Cursorius gracilis, sp. n., Massailand; iid. t. c. p. 178.

Stephanibyx coronata, from Shoa (north of Equator); Salvadori, Ann. Mus. Genov. 1884, p. 26.

Streptilas interpres new to San Domingo; Tristram, Ibis, 1884, p. 168.

CHIONIDIDÆ.

Chionis alba from the S. Georgian Is.; Cabanis, J. f. O. 1884, p. 248.

SCOLOPACIDÆ.

Actodromas maculata in Alaska, its breeding habits; E. W. Nelson, Auk, i. pp. 218-221 [cf. P. Z. S. 1859, p. 130].

Eurynorhynchus pygmaeus from Yokohama, Japan; Seebohm, P. Z. S. 1884, p. 410.

Gallinago uniclava of former list = *G. scolopacina* of Bp.; Dybowski & Taczanowski, Bull. Soc. Z. Fr. 1884, p. 161.

Himantopus rufipes from S.E. Borneo = *H. leucocephalus* in Leyden Mus. ?; W. Blasius, J. f. O. 1884, p. 218.

Limicola hartlaubii, remarks on the type specimen, which is compared with *L. platyrhyncha*; the only material difference (the size of bill) is not sufficient to constitute a species; Stejneger, Z. Ges. Orn. 1884, pp. 84 & 85.

Lobipes [*Steganopus*] *tricolor*; id. Auk, i. p. 367.

Numenius longirostris, its osteology, together with notes upon the skeletons of other American *Limicolæ*; Shufeldt, J. Anat. Phys. xix. pp. 51-82, pls. iv. & v.

Phalaropus fulicarius new to the Southern Hemisphere [New Zealand]; J. v. Haast, Tr. N. Z. Inst. 1883, pp. 279 & 280. *P. hyperboreus*, occurrence in Siebenburgen; J. v. Csató, Z. Ges. Orn. 1884, pp. 22-25.

Pseudototanus [*Pseudoglossis*] *guttifer* (Nord.) differs from *Tot. nebularius*, and is identical with *T. haughtoni*, Armst.; Stejneger, t. c. pp. 223-229, pl. x.

Scolopax grisea new to Japan; Seebohm, Ibis, 1884, pp. 33 & 34.

Totanus melanoleucus new to Venezuela; v. Berlepsch, t. c. p. 441.

Tringa minuta breeding in the Lena-Delta; Bunge, Mël. Biol. 1884, p. 56.

GAVIÆ.

LARIDÆ.

Laridæ fam. [see SAUNDERS, H. Also J. W. Collins, Auk, i. pp. 236-238].

Anous gen., sub voce "Noddy"; A. Newton, Encycl. Brit. Ed. 9, xvii.

Larus affinis; Stejneger, Auk, i. p. 359. *L. atrivilla* cancelled from the Brit. list; Saunders, Hist. Brit. Birds [Yarrell], iii. pp. 666-608: correction of mistake about a specimen in Brit. Museum; *id.* P. Z. S. 1884, p. 150. *L. californicus* in the Farallones Is., Gulf of California; Gruber, Z. Ges. Orn. 1884, p. 168. *L. dominicanus* attacking sheep; Potts, MT. orn. Ver. Wien, 1884, p. 168. *L. gelastes*, its eggs; Chapman, Ibis, 1884, p. 86. *L. glaucescens*; Stejneger, Auk, i. p. 360. *L. heermanni* in the Farallones Is., Gulf of California; Gruber, Z. Ges. Orn. 1884, p. 168. *L. ichthyaetus* figured; Saunders, Hist. Brit. Birds [Yarrell], iii. pp. 609-612. *L. kumlieni*, in New York State [identified by W. Brewster], it is possibly a race of *L. glaucescens*; Park, Auk, i. p. 196. *L. leucopterus* from New York State; Lawrence, *t. c.* pp. 240-242; Stejneger, *t. c.* p. 360. *L. melanocephalus* breeding in Spain; Chapman, Ibis, 1884, p. 86. *L. minutus* new to Norway; Collett, Förh. Selsk. Chr. 1883, No. 15: in North Uist; J. A. Harvie Brown, P. Phys. Soc. Edinb. 1883-84, pp. 105-112. *L. nelsoni*, sp. n., allied to *L. kumlieni*; Henshaw, Auk, i. pp. 250-252. *L. occidentalis* in the Farallones Is., Gulf of California; Gruber, Z. Ges. Orn. 1884, p. 168. *L. philadelphia*, adult shot on Loch Lomond; Saunders, P. Z. S. 1884, p. 150. *L. schistisagus*, sp. n., from Bering I., Kamtschatka; Stejneger, Auk, i. pp. 231-233.

Pagophila eburnea, habits in Spitzbergen; Cocks, Zool. 1884, p. 13.

Rhodostelthea rossii, a pair seen in the Lena-Delta; Bunge, Mel. B. 1884, p. 57.

Rissa brevirostris, does it occur on the Okotsk Sea?; Stejneger, Auk, i. pp. 358 & 359.

Stercorarius buffoni in New England; Collins, Auk, i. pp. 237 & 238: in Vermont; Batchelder, *t. c.* p. 98: in Moravia and Tyrol; J. Talsky, Z. Ges. Orn. 1884, pp. 14-18. *S. pomatorhinus* in Moravia and Tyrol; *id. ibid.* *S. catarrhactes* in New England; Collins, Auk, i. pp. 237 & 238.

Sterna cantiaca new to Norway; Collett, Förh. Selsk. Chr. 1883, No. 15. *Sterna (Gelocheledon) nilotica* of Hasselqvist is the correct name for *S. anglica*; Stejneger, Auk, i. pp. 364-366. *S. regia*, its recurrence at Tangiers; Dalgleish, *t. c.* p. 97. *S. sinensis* new to Japan; Seebohm, Ibis, 1884, p. 32.

Xema sabinii, in adult plumage, from Mull; Bidwell, P. Phys. Soc. Edinb. 1883-84, pp. 131-135: from Dublin Bay; Dowling, Zool. 1884, p. 490.

TUBINARES.

PROCELLARIIDÆ.

Procellariide fam.; J. W. Collins, Auk, i. pp. 236-238.

Diomedea nigripes new to Japan; Seebohm, Ibis, 1884, p. 176; Blakiston, List Birds Japan, p. 35.

Oceanites oceanica at Lockport, N.Y.; Davison, Auk, i. p. 294.

Œstrelata hesitata in Hungary; Clarke, Ibis, 1884, p. 202.

Priocella tenuirostris is not a bird of Bering Sea or the Arctic Ocean; Stejneger, Auk, i. pp. 233 & 234.

Procellaria leucorrhoa breeding on North Rona ; Swinburne, P. Phys. Soc., Edinb. 1883-84, p. 64 : from the Tamar ; Gatcombe, Zool. 1884, p. 53 : in Somerset ; Cecil Smith, *t. c.* p. 145 : in Yorks ; Clarke & Roebuck, *t. c.* p. 180.

Puffinus stricklandi, sp. n., Atlantic Coast, N. Am. ; R. Ridgway, in Baird, Brewer, & Ridgway, N. A. Water Birds, ii. p. 390. *P. carneipes* new to Japan ; Blakiston, List Birds Japan, p. 36. *P. griseus*, its occurrence in Britain ; Saunders, Hist. Brit. Birds [Yarrell] iv. pp. 17-20 : in Yorks : T. H. Nelson, Zool. 1884, p. 147 ; Clarke & Roebuck, *t. c.* p. 180.

PYGOPODES.

PODICIPEDIDÆ.

Dytes nigricollis californicus, notes on its breeding habits ; Goss, Auk, i. pp. 18-20.

Podiceps infuscatus, sp. n., Shoa, N.E. Africa ; Salvadori, Ann. Mus. Genov. 1884, p. 25.

ALCIDÆ.

Alca impennis, supposed occurrence in Norway, and remains in Norwegian collections ; Collett, MT. orn. Ver. Wien, 1884, pp. 65-69 & 87-89 [see BLASIUS, W.]. *A. torda* in the Gulf of Trieste ; B. Schiavuzzi, Z. Ges. Orn. 1884, p. 243.

Brachyrhampus hypoleucus in California ; Goss, Auk, i. p. 396.

Cepphus motzfeldi (Benicken) is possibly a distinct species, = *C. unicolor* ; Stejneger, P. U. S. Nat. Mus. vii. pp. 210-229. *C. mandtii* and *C. columba* compared with *C. grylle*, the range of the first is to be considerably increased ; *id. ibid.* *C. carbo*, does it occur in North America ? ; *id. ibid.*

Lomvia californica in the Farallone Is., Gulf of California ; Gruber, Z. Ges. Orn. 1884, p. 168. *L. troile*, skeleton figured ; Meyer, Abbild. von Vogel-skel. p. 42, pl. liii.

Synthliborhampus antiquus in Wisconsin ; Sennett, Auk, i. pp. 99 & 100.

IMPENNES.

SPHENISCIDÆ.

Microdyptes serresiana from Cape Horn ; Am. Nat. [Edd.] 1884, p. 833.

CRYPTURI.

TINAMIDÆ.

Calodromas to be changed to *Calopezus* ; Ridgway, P. Biol. Soc. Wash. ii. p. 97.

RATITÆ.

APTERYGES.

APTERYGIDÆ.

Apteryx oweni, skeleton figured ; Meyer, Abbild. von Vogel-skel. p. 42, pl. liv.

Megalapteryx hectori, sp. n., figure of its leg-bones, which were found among Moa bones in the Nelson Museum ; J. v. Haast, Tr. N. Z. Inst. 1883, pp. 279 & 280.

IMMANES.

DINORNITHIDÆ.

Dinornis elephantopus, description of its sternum from Christchurch, N.Z., being the 25th memoir on the extinct birds of the genus *Dinornis* and their allies ; R. Owen, P. Z. S. 1884, p. 176. *D. quenslandiæ* from Australia ; C. W. de Vis, P. R. Soc. Queensl. i. pt. 1, pp. 23-28, pls. iii. & iv.

MEGISTANES.

CASUARIIDÆ.

Casuarius sp. ?, eggs from Aru ; Meyer, Z. Ges. Orn, 1884, p. 296.

RHEÆ.

RHEIDÆ.

Rhea americana, its reproduction, its rearing in captivity ; G. Pays-Mellier, Bull. Soc. Acclim. 1884, pp. 111-112, & 916, respectively.

STRUTHIONES.

STRUTHIONIDÆ.

Struthio : are there 3 species in Africa ? ; A. T. de Rochebrune, Act. Soc. L. Bord. viii. pp. 435-437. *S. molybdophanes*, sp. n., a pair in the aviary of Dr. Monaco at Turin ; Salvadori, Ibis, 1884, p. 116 [a note is added by the editors concerning this species] : it is an undoubted species ; O. Finsch, t. c. pp. 352 & 353 : its difference from *S. camelus* ; Reichenow, J. f. O. 1884, p. 238 : a supposed egg ; Dallwitz, t. c. pp. 245 & 246 : it is probably identical with *S. australis* ; J. H. Gurney, Ibis, 1884, pp. 465 & 466 : it is compared with *S. australis* and *S. camelus*, their supposed eggs are discussed, with plate of those of *S. molybdophanes* and *S. australis* ; Henke, Z. Ges. Orn. 1884, pp. 219-222.

SAURURÆ.

ARCHÆOPTERYX.

Archæopteryx [see DAMES, W., and PAULOW, A.].

VAILLANT

REPTILIA AND BATRACHIA.

BY

G. A. BOULENGER.

GENERAL.

C. C. ABBOTT has notes on the hibernation of Reptiles and Batrachians ; Science, iii. pp. 36-39, woodcuts.

O. BOETTGER, in Reichenow's Handwörterbuch der Zoologie, &c., iii. pp. 456-466, gives an outline of the history of Herpetology, noticing the progress in the classification and the knowledge of the geographical distribution from Linnæus to the present day.

DUNCAN, P. M. Reptiles and Batrachians in Cassell's Natural History, vol. iv. 1883, pp. 240-380, with numerous illustrations.

This popular account has unfortunately many errors of various kinds, and most of the illustrations are far from satisfactory.

FISCHER, J. v. Das Terrarium, seine Bepflanzung und Bevölkerung. Ein Handbuch für Terrarienbesitzer und Tierhändler. Frankfurt-a.-M. : 1884, 8vo, xv. & 384 pp., woodcuts.

Deals chiefly with Reptiles and Batrachians, containing copious notes on their habits, propagation, &c., in captivity, as well as a systematic list with short descriptions of the species most frequently kept in confinement.

MÜLLER, F. Dritter Nachtrag zum Katalog der Herpetologischen Sammlung des Basler Museums. Verh. Ges. Basel, vii. pp. 274-297, pl. v.

FAUNÆ.

EUROPE.

CAMERANO, L. Amphibiorum Italiæ enumeratio systematica. P. Z. S. 1884, pp. 421-425 ; also Zool. Anz. vii. pp. 497-499.

— Monografia degli Anfibi Anuri Italiani. Mem. Acc. Tor. (2) xxxv. pp. 187-284, pls. i. & ii.

Extensive descriptions, and figures of the skeletons, of all the species ; also full figures of the 4 species of *Rana*.

1884. [VOL. XXI.]

MASSA, C. Notizie intorno alla Fauna dei Vertebrati di Monfalcone.
Atti Soc. Mod. (3) iii. pp. 89-100 [Reptiles and Batrachians, pp. 89-100 & 99].

A. V. MOJSISOVICS gives a list of the (10) Reptiles and (10) Batrachians of Belye and Darda, Hungary; MT. Ver. Steierm. 1883, pp. 162-166.

LÖWIS, O. v. Die Reptilien Kur-, Liv- und Esthlands. Ein Handbüchlein für alle Naturfreunde in Stadt und Land. Riga: 1884, 8vo, xv. & 62 pp.

F. T. KÖPPEN has notes on the Herpetology of the Crimea, giving also a list of all the species. Beitr. Russ. Reiches (2) vi. pp. 63-85 [1883].

ASIA.

TRISTRAM, H. B. The Survey of Western Palestine. The Fauna and Flora of Palestine. London: 1884, 4to.

Pp. 140-161 contain a list of the *Reptilia* and *Batrachia*, which is unfortunately compiled without great care.

MURRAY, J. A. Additions to the present knowledge of the Vertebrate Zoology of Persia. Ann. N. H. (5) xiv. pp. 97-106.

8 species of Reptiles, 1 of which is new, are added to the fauna of Persia.

—. The Vertebrate Zoology of Sind. A systematic account, with descriptions of all the known species of Mammals, Birds, and Reptiles inhabiting the province; observations on their habits, &c. London & Bombay: 1884, 8vo [*Reptilia* and *Batrachia*, pp. 338-401, 5 pls.].

Although chiefly a compilation, this work contains descriptions of several new species, and others are recorded from Sind for the first time. The number of species of Reptiles known from that province is estimated at 90, and that of Batrachians at 6.

—. Additions to the Reptilian Fauna of Sind. Ann. N. H. (5) xiv. pp. 106-111.

Notes on 4 species, 2 of which are described as new.

W. THEOBALD, in F. Mason's Burma, vol. i. (Hertford: 1882, 8vo) pp. 288-344, gives a list of the Reptiles and Batrachians of British Burma. Also Appendix, pp. 497-501.

AFRICA.

ROCHEBRUNE, A. T. DE. Faune de la Sénégambie: Reptiles (22 pls.) et Amphibiens (50 pp., 10 pls.). Paris: 1884, 8vo.

The worst herpetological work that has appeared for many years.

SAUVAGE, H. E. Notice sur une Collection de Reptiles et de Poissons recueillie à Majumba, Congo. Bull. Soc. Z. Fr. ix. pp. 199-208, pl. vi.

28 Reptiles (3 new) and 10 Batrachians are recorded.

VAILLANT, L. Note sur une collection de Reptiles rapportée d'Assinie par M. Chaper. Bull. Soc. Philom. (7) viii. pp. 168-171.

A genus and 3 species are described as new.

FISCHER, J. G. Über die von Herrn Dr. G. A. Fischer im Massai-Gebiete (Ost-Afrika) auf seiner in Veranlassung der Geographischen Gesellschaft in Hamburg unternommenen Expedition gesammelten Reptilien, Amphibien, und Fische. JB. Hamb. wiss. Anst. i. pp. 3-32, pls. i. & ii.

A list of 24 species of Reptiles, of which 5 are given as new, and 4 Batrachians.

—. Über einige Reptilien von Nossi-Bé und Madagaskar. T. c. pp. 33-38, pl. iii.

2 new species described.

AMERICA.

GARMAN, S. The North American Reptiles and Batrachians. A List of the Species occurring North of the Isthmus of Tehuantepec, with References. Bull. Ess. Inst. xvi.

Remarks on this paper in Am. Nat. xviii. p. 513.

LOCKINGTON, W. N. Review of the Progress of North American Batrachology in the years 1880-83. Am. Nat. xviii. pp. 149-154.

GARMAN, S. The Reptiles of Bermuda. Bull. U. S. Nat. Mus. xxv. pp. 287-289.

5 species of Reptiles, viz., a lizard and 4 marine turtles, are all that are known to be found on the Bermudas.

Critical remarks on the Ophiological part of the 'Mission Scientifique au Mexique, Rech. sur les Reptiles'; E. D. COPE, Am. Nat. xviii. pp. 162 & 163.

BOULENGER, G. A. On a Collection of Frogs from Yurimaguas, Hualaga River, Northern Peru. P. Z. S. 1883, pp. 635-638, pls. lvii. & lviii.

18 species are enumerated, 8 of which are new.

C. BERG, in C. Holmberg's 'Viajes al Tandil y á La Tinta,' Act. Acad. Cordoba, v. pp. 93-97, gives a list of the 11 Reptiles and 3 Batrachians obtained by that expedition.

AUSTRALIA AND POLYNESIA.

CYLLAX, W. Notes on some Reptiles from the Herbert River, Queensland. P. Linn. Soc. N. S. W. viii. pp. 432-436.

A list of 3 species of lizards, 1 of which is described as new, and 7 of snakes, 3 of which are given as new.

BOULENGER, G. A. Diagnoses of new Reptiles and Batrachians from the Solomon Islands, collected and presented to the British Museum by H. B. Guppy, Esq., M.B., H.M.S. 'Lark.' P. Z. S. 1884, pp. 210-213.

PALÆONTOLOGICAL.

A. T. METCALFE reports on some very fragmentary Reptilian (?) remains from the Triassic strata of the South Coast of Devonshire; *J. G. Soc.* xl. pp. 257-262, figs.

* ROCHEBRUNE, A. T. DE. Faune Ophiologique des Phosphorites du Quercy. Châlons-s.-S.: 1884, 4to, 16 pp.

GÜRICH, G. Ueber einige Saurier des oberschlesischen Muschelkalkes. *Z. geol. Ges.* xxxvi. pp. 125-142, pl. ii.

KOKEN, E. Die Reptilien der Norddeutschen unteren Kreide. *Z. geol. Ges.* xxxv. [1883] pp. 735-827, pls. xxiii.-xxv.

TRAUTSCHOLD, H. Die Reste permischer Reptilien des palæontologischen Kabinetts der Universität Kasan. *Nouv. Mém. Ac. Mosc.* xv. pp. 1-38, pls. i.-viii.

LYDEKKER, R. Catalogue of Vertebrate Fossils from the Siwaliks of India in the Science and Art Museum, Dublin. *Tr. R. Dublin Soc.* (2) iii. [*Rept.* pp. 84-86].

COPE, E. D. The *Batrachia* of the Permian Period of North America. *Am. Nat.* viii. pp. 26-39, woodcuts, pls. ii.-v.

REPTILIA.

BRONN, H. G. Klassen und Ordnungen des Thierreichs. vi. Abth. iii. *Reptilia*, by C. K. Hoffmann.

Lief. 41-43, pp. 1265-1424, were issued in 1884. Conclusion of the systematic part and palæontological and biological chapters of the *Lacer-tilia*. Anatomical part of the *Ophidia*.

DOLLO, L. Notes erpétologiques. *Zool. Anz.* vii. pp. 547 & 548.

1. Chameleons possess a columella cranii. 2. The entepi- and ectepi-condylian canals are both present in *Hatteria*.

GENTIL, A. Erpétologie de la Sarthe. Le Man: 1884, 8vo, 32 pp. Extr. from *Bull. Soc. Sarthe*.

HOFFMANN, C. K. Beiträge zur Entwicklungsgeschichte der Reptilien. *Z. wiss. Zool.* xl. pp. 214-246, pls. xiii. & xiv.

RETZIUS, G. Das Gehörorgan der Wirbelthiere. II. Das Gehörorgan der Reptilien, der Vögel, und der Säugethiere. Stockholm: 4to, 1884.

STRAHL, H. Über Entwicklungsvorgänge am Kopf und Schwanz der Reptilien- und Säugethier-embryonen. *Zool. Anz.* vii. pp. 312-318.

ORNITHOSAURIA.

MARSH, O. C. Principal Characters of American Cretaceous Pterodactyls. Part I. The Skull of *Pteranodon*. *Am. J. Sci.* (3) xxvii. pp. 423-426, pl. xv.; also *Geol. Mag.* (2) iii. i. pp. 345-348.

A description of a nearly complete skull of *Pteranodon longiceps*, Marsh.

L. DOLLO gives a short review of the state of our knowledge of the *Ornithosauria*; Rev. Quest. Sci. viii. pp. 292-297.

Ornithocheirus hilsensis, sp. n., Koken, Z. geol. Ges. xxxv. [1883] p. 824, pl. xxiii. fig. 2, Hils of Delligsen.

? *Trematina foveolata*, g. & sp. nn., for a fragment of mandible from the Permian of Wjerchny Usslon, Kasan. The systematic position of this fossil is not clear. Trautschold, Nouv. Mém. Ac. Mosc. xv. p. 37, pl. viii. fig. 3.

DINOSAURIA.

BAUR, J. G. Note on the Pelvis in Birds and Dinosaurs. Am. Nat. xviii. pp. 1273-1275.

The upper part of the "pectineal process" forming a part of the ilium in the *Ratite* corresponds to the whole "pectineal process" of the *Carinata*, and to that part of the Dinosaurian ilium which articulates with the pubis; the lower part is homologous with the pubis of the Dinosaurs, which has become quite rudimentary in the *Carinata*. The author also gives a table showing the development of the "pubis" and "postpubis" in the series of Dinosaurians and Birds.

Also a paper on the same subject in Morph. JB. x. pp. 446-454.

DOLLO, L. Cinquième note sur les Dinosauriens de Bernissart. Bull. Mus. Belg. iii. pp. 129-146, pls. vi. & vii.

Discusses the homology of the "post-occipital" bones of Marsh, which are shown to be the "pro-atlas"; and the elevator muscles of the mandible and their influence on the shape of the skull. A figure of a mounted specimen of *Iguanodon mantelli* is appended to this memoir.

L. DOLLO indicates the principal forms actually known of the Order *Dinosauria*; Rev. Quest. Sci. viii. pp. 297-300.

MARSH, O. C. Principal Characters of American Jurassic Dinosaurs. Part VII. On the *Diplodocidae*, a new family of the *Sauropoda*. Am. J. Sci. (3) xxvii. pp. 161-168, pls. iii. & iv.; also Geol. Mag. (2) iii. i. pp. 99-107.

A description of *Diplodocus longus*, g. & sp. nn., from the Upper Jurassic beds near Cañon City, Colorado. The Order *Sauropoda* is divided into three families, viz.: 1, *Atlantosauridae*; 2, *Diplodocidae*; 3, *Morosauridae*.

Principal Characters of American Jurassic Dinosaurs. Part VIII. The Order *Theropoda*. T. c. pp. 329-340, pls. viii.-xiv.; also Geol. Mag. t. c. pp. 252-252.

Cycols chiefly with *Ceratopsus nasicornis*, g. & sp. nn. (p. 330, pls. On i.). from the Upper Jurassic of Colorado. Restorations of the pelvis of *Allosaurus* and *Celurus* (pl. xi.), of the limbs of *Allosaurus fragilis* (pl. xii.), and figures of the vertebrae of *Celurus fragilis* (pl. xiii.) and *Creosaurus atrox* (pl. xiv.), are also given. *Labrosaurus ferox*, sp. n. (p. 333, pl. ix. figs. 4-6), for a dentary bone from the same locality. The author concludes by giving the main characters of the Order *Theropoda*, which falls into three sub-orders and seven families, viz.: 1, *Megalos-*

sauridæ; 2, *Ceratosauridæ*; 3, *Labrosauridæ*; 4, *Zanclodontidæ*; 5, *Amphisauridæ*; 6, *Cæloridæ*; 7, *Compsognathidæ*; the latter constituting the sub-orders *Cæloria* and *Compsognatha* respectively.

The same author, *op. cit.* xxviii. pp. 161 & 162, woodcut, also describes and figures the metatarsal bones of *Ceratosaurus*, which are united as in birds.

VETTER, B. Zur Kenntniss der Dinosaurier und einiger anderer fossiler Reptilien. Kosmos, xv. pp. 350-365, pls. i. & ii.

A summary of Marsh's recent publications on the *Dinosauria Sauropoda* and *Theropoda*.

A review of Marsh's paper on the metatarsals of *Ceratosaurus*; L. Dollo, Rev. Quest. Sci. viii. pp. 646-648.

W. DAMES remarks on the metatarsals of a *Compsognathus*-like Dinosaur from the lithographic slates of Solenhofen; SB. nat. Fr. 1884, p. 179.

Megalosaurus dunkeri, sp. n., for a tooth from the Wealden of North Germany; Dames, t. c. p. 186.

CHELONIA.

HOWELL, W. H. Notes on the Composition of the Blood and Lymph of the Slender Terrapin (*Pseudemys rugosa*). Stud. Biol. Lab. Hopkins Univ. iii. pp. 49-62.

DOLLO, L. Première note sur les Chéloniens de Bernissart. Bull. Mus. Belg. iii. pp. 63-79, pls. i. & ii.

Gives an abstract of Strauch's classification and the diagnoses of two new genera. The *Thalassemydes* of Rutimeyer are admitted as a family.

S. GARMAN, Bull. U. S. Nat. Mus. xxv. pp. 299-303, publishes a list of the Sea Turtles, with synonymy.

J. C. COX gives the dimensions of two gigantic Land Tortoises (sp.?), living in Sydney; P. Linn. Soc. N. S. W. viii. p. 531.

Melanochelys picta, sp. n., J. A. Murray, Ann. N. H. (5) xiv. p. 107, Upper Sind.

Chitracephalus, g. n. (foss.), of the group *Thalassemydes*. *C. dumoni*, sp. n., Dollo, t. c. p. 70, pl. i., Wealden of Bernissart, Belgium.

Peltochelys, g. n. (foss.), apparently related to *Peltocephalus*. *P. duchasteli*, sp. n., *id.* t. c. p. 78, pl. ii., Wealden of Bernissart, Belgium.

Pleurosternon keneni, sp. n. (foss.), Grabbe, Z. geol. Ges. xxxvi. p. 19, pl. i., Wealden of Schaumburg, Germany.

Pelomedusa gasconi, sp. n., Rochebrune, Rept. Sénégal. p. 25, Senegambia [= *P. galeata*.—REC.].

Hydromedusa, Wagl. Günther, Ann. N. H. (5) xiv. pp. 42 ^{humeri} ^{nelus}, revises the synonymy of the species of this genus. *H. platanensis*, Gray (= *Chelodina maximiliani*, D. & B., part): a young specimen described and figured; *id.* t. c. p. 423, pl. xiv. *H. wagleri*, sp. n. (= *C. maximiliani*, Wagl., *nec* Mikán); *id.* t. c. p. 423 [= *H. tectifera*, Cope.—REC.].

Chelymys macquaria, Cuv., figured by McCoy, Prodr. Zool. Vict. Dec. ix. pls. lxxxii. & lxxxiii.

Tetrahyra vaillanti, sp. n., Rochebrune, Rept. Sénégal. p. 36, pl. iv. figs. 1 & 2, Senegambia.

Chelonia hoffmanni, Gray (foss.). The lower jaw described and figured by C. Ubachs, Ann. Soc. Géol. Belg. x. pp. 25-35, pl. i.

Protosphargis, g. n. (foss.), nearly allied to *Sphargis*, for *P. veronensis*, sp. n., *Capellini, Mem. Acc. Lincei, xviii., Upper Cretaceous of Verona [cf. Arch. Ital. Biol. v. pp. 440-442, woodcuts].

MACOLOGNATHA. Under this name, O. C. Marsh proposes to establish a new Order of *Reptilia* for a mandible from the Atlantosaurus beds of the Upper Jurassic, Wyoming Territory. The specimen is named *Macelognathus vagans*, g. & sp. nn. The rami form a long symphysis, and are edentulous anteriorly; lateral teeth implanted in sockets. "They appear to be nearest allied to the *Chelonia*." Am. J. Sci. (3) xxvii. p. 341, woodcut.

THERIODONTIA.

Brithopus priscus, Kutorga. Notes on remains from the Permian of Russia; Trautschold, Nouv. Mém. Ac. Mosc. xv. p. 27, pl. v. figs. 4-7, & pl. vi.

Zygosaurus lucius, Eichw.; *id. t. c.* p. 30, pl. vii.

Deuterosaurus biarmicus, Eichw.; *id. t. c.* p. 33, pl. vii. figs. 3-10.

ANOMODONTIA.

Oudenodon rugosus, sp. n., Trautschold, Nouv. Mém. Ac. Mosc. xv. p. 35, pl. viii. figs. 1 & 2, Permian of Butlerowka, Kasan.

ICHTHYOSAURIA.

Ichthyosaurus polyptychodon, p. 737, and *hildesiensis*, p. 761, spp. nn., Koken, Z. geol. Ges. xxxv. [1883].

PLESIOSAURIA.

Nothosaurus latifrons, sp. n., Gürich, Z. geol. Ges. xxxvi. p. 132, pl. ii. figs. 3 & 4, Muschelkalk of Silesia.

Dactylosaurus, g. n., for *D. gracilis*, sp. n., *id. t. c.* p. 125, pl. ii. figs. 1 & 2, Muschelkalk of Silesia.

Cyamodus tarnowitzensis, sp. n., *id. t. c.* p. 136, Muschelkalk of Silesia.

Or, remains of *Plesiosaurus* and *Polyptychodon*; Koken, Z. geol. Ges. xxxv. [1883] pp. 780-791.

CROCODILIA.

R. OWEN remarks on the cranial and vertebral characters of the extinct genus *Plesiosuchus*, Owen. J. G. Soc. xl. pp. 153-159, figs.

Enaliosuchus, g. n. (*Mesosuchia*), for *E. macrospondylus*, sp. n.; Koken, Z. geol. Ges. xxxv. [1883] p. 792, figs., Hills of Osterwald.

Crocodylus intermedius, Gray. Note by Lütken, Vid. Medd. 1884, pp. 61-76, pl. v.

Alligator. On the subgenera of this genus; *id. t. c.* pp. 76-79.

RHYNCHOCEPHALIA.

COPE, E. D. The Structure of the Columella auris in *Clepsydrops leptcephalus*. Am. Nat. xviii. pp. 1253 & 1254. [An abstract of a forthcoming memoir.]

V. LEMOINE has a note on *Simædosaurus*, Gerv., a fossil lizard which he regards as the type of a new family, "Simædosauriens." C.R. xcvi. pp. 697-699.

DOLLO, L. Première note sur le Simædosaurien d'Erquelinnes. Bull. Mus. Belg. iii. pp. 151-182, pls. viii. & ix.

Deals with the vertebral column and the pectoral arch of *Champsosaurus*, Cope, = *Simædosaurus*, Gervais. The species from the Lower Eocene of Erquelinnes is referred to *C. lemoinei*, Gerv. The author discusses the views of previous authors on the systematic position of this genus, and proposes to create for it a new Order, *Simædosauria*.

LACERTILIA.

The Recorder, Ann. N. H. (5) xiv. pp. 117-122, proposes a new classification of the existing *Lacertilia* :—

Sub-order I. *Lacertilia vera*.

Families—1, *Geckonidæ*; 2, *Eublepharidæ*; 3, *Uroplatidæ* (fam. n.); 4, *Pygopodidæ*; 5, *Agamidæ*; 6, *Iguanidæ*; 7, *Xenosauridæ*; 8, *Zonuridæ*; 9, *Anguidæ*; 10, *Aniellidæ*; 11, *Helodermatidæ*; 12, *Varanidæ*; 13, *Xantusiidæ*; 14, *Teiidæ*; 15, *Amphisbenidæ*; 16, *Lacertidæ*; 17, *Gerrhosauridæ* (fam. n.); 18, *Scincidæ*; 19, *Anelytropidæ*; 20, *Dibamidæ* (fam. n.).

Sub-order II. *Rhoptoglossa*.

Family—21, *Chamaeleontidæ*.

BÉRANECK, E. Recherches sur le développement des nerfs crâniens chez les lézards. Rec. Z. Suisse, i. pp. 519-603, pls. xxvii.-xxx.

DOLLO, L. Sur les Epiphyses des Lacertiliens. Zool. Anz. vii. pp. 80-84.

True epiphyses do exist in the *Lacertilia*.

ERDÖS, J. Entwicklung der Allantoishöhle bei den Eidechsen. Math. Nat. Ber. Ung. ii. pp. 227-231, pl. vii.

SCHÖBL, J. Ueber Wundernetzbildungen im Fettgewebe. 1. In der Umgebung der Schwanzwirbelsäule einiger Saurier. Arch. mikr. Anat. xxiv. pp. 92-95, pl. v.

GECKONIDÆ.

Stenodactylus dunstervillei, sp. n., Murray, Zool. Sind, p. 363, Sind [= *S. orientalis*, Blauf., in erratum].

Ceramodactylus affinis, sp. n., *id.* Ann. N. H. (5) xiv. p. 103, Tanjistan, Persia.

Pristurus rupestris, Blauf., described and figured from Sind; *id.* Zool. Sind, p. 365, pl. —, fig. 1.

Gymnodactylus scaber, Rüpp., described from Persia; *id.* Ann. N. H. (5) xiv. p. 102; noticed from Sind, *id. t. c.* p. 110. *G. kotschyi*, Steind.: on its occurrence in Italy; M. Peracca, Zool. Anz. vii. p. 572. *G. petrensis*, sp. n., Murray, Zool. Sind, p. 362, pl. —, fig. 1, Sind [= *G. kushensis*, Stol.—REC.].

Phyllurus blavieri, sp. n., Rochebrune, Rept. SÉNÉGAMB. p. 81, pl. ix. figs. 5 & 6, Senegambia.

Hemidactylus gleadowi, p. 360, pl. —, fig. 3 [= *H. maculatus*, Gthr., nec D. & B.] and *karachiensis*, p. 361, fig. 2 [= *H. turcicus*, L.], spp. nn., Murray, Zool. Sind, Sind. *H. kushmorensis*, sp. n., *id.* Ann. N. H. (5) xiv. p. 109, Upper Sind.

Lepidodactylus guppyi, sp. n., Boulenger, P. Z. S. 1884, p. 210, Solomon Islands.

Phelsuma. Remarks on a specimen from Nossi-Bé, referred to *P. cepedianum*; Fischer, JB. Hamb. wiss. Anst. i. p. 33. *P. newtoni*, sp. n., Boulenger, P. Z. S. 1884, p. 2, Rodriguez.

UROPLATIDÆ.

Uroplates battgeri, sp. n., Fischer, JB. Hamb. wiss. Anst. i. p. 33, pl. iii. fig. 9, Nossi Bé [= *U. ebenauai*, Bttgr.—REC.].

AGAMIDÆ.

Tiaris boydi, sp. n., Macleay, P. Linn. Soc. N. S. W. viii. p. 432, Herbert River, Queensland.

Agama sinaita, Heyd., figured by Tristram, Fauna of Palestine, pl. xvi. fig. 3. *A. mossambica*, Ptrs., redescribed and head figured by Fischer, JB. Hamb. wiss. Anst. i. p. 21, pl. ii. fig. 6. *A. savatieri*, p. 89, pl. xi. figs. 1 & 2, and *bocourti*, p. 91, pl. xi. figs. 3 & 4, spp. nn., Rochebrune, Rept. SÉNÉGAMB., Senegambia.

Physignathus lesueurii, Gray, figured by McCoy, Prodr. Zool. Vict. Dec. ix. pl. lxxxi.

Centrotrachelus asmussi (?) mentioned from Bushire, Persia; Murray, Ann. N. H. (5) xiv. p. 101.

Uromastix costatus, sp. n.?, F. Müller, Verh. Ges. Basel, vii. p. 294 [= *U. loricatus*, Blauf.—REC.].

AMPHISBENIDÆ.

Amphisbæna cinerea, Vaud.: on its anatomy; J. v. Bedriaga, Arch. f. Nat. l. pp. 23-77, pl. iv. *A. strauchi*, sp. n., *id. ibid.*, Smyrna; occurs in Asia Minor and Turkey, *id.* Zool. Anz. vii. p. 346.

Blanus bedriagæ, sp. n., Boulenger, Ann. N. H. (5) xiii. p. 396, Asia Minor.

LACERTIDÆ.

Lacerta viridis var. n. *gadowi*, Boulenger, P. Z. S. 1884, p. 418, pl. xxxviii., South Portugal [= *L. schreiberi*, Bedr.—REC.]. *L. hirticauda*, sp. n., Vaillant, Bull. Soc. Philom. (7) viii. p. 168, Gold Coast [= *L. echinata*, Cope.—REC.].

Latastia, g. n. Distinguished from *Lacerta* chiefly by the keeled infra-digital scales; for *Lac. samharica*, Blanf. (= ? *L. sturti*, Blanf.). *Bedriaga*, Ann. Mus. Genov. xx. p. 307. *L. doriai*, sp. n., p. 313, and var. n. *martensi*, p. 316, and *L. boscai*, sp. n., p. 322, Abyssinia, *id. t. c.*

Psammodromus hispanicus, Fitz. On its habits and reproduction in captivity; J. v. Fischer, Zool. Gart. xxv. pp. 38-44 & 75-82.

Acanthodactylus vulgaris, D. & B.: on its habits in captivity; *id. t. c.* pp. 338-340. *A. tristrami*, Gthr., figured by Tristram, Fauna of Palestine, pl. xvi. fig. 2.

Calosaura chaperi, sp. n., Sauvage, Bull. Soc. Philom. (7) viii. p. 142, Bellari, India.

GERRHOSAURIDÆ.

Gerrhosaurus dulignoni, sp. n., Rochebrune, Rept. Sénégal. p. 110, pl. xii. fig. 2, Senegambia.

SCINCIDÆ.

Scincus arenaria, sp. n., Murray, Zool. Sind, p. 353, pl. —, fig. 2, Sind [= *S. officinalis*.—REC.].

Eumeces longirostris, Cope, described by Garman; Bull. U. S. Nat. Mus. xxv. p. 287. *E. massaianus*, sp. n., Fischer, JB. Hamb. wiss. Anst. i. p. 18, pl. ii. fig. 5, Plateau of Naiwasha, 6000 feet. *E. schwartzi*, sp. n. *id.* Abh. Verh. Hamb. viii. p. 3, pl. vii. fig. 1, Bay of Campeche.

Mabuya joberti, sp. n., Thominot, Bull. Soc. Philom. (7) viii. p. 148, Itatiaba, Brazil.

Euprepes chaperi, sp. n., Vaillant, Bull. Soc. Philom. (7) viii. p. 169, Gold Coast.

Ablepharus panonicus, Fitz. On this species in captivity; J. v. Fischer, Zool. Gart. xxv. pp. 314-320.

Cophoscincus, g. n. (¶ Peters). Distinguished from *Tropidophorus* by having the tympanum concealed. *C. simulans*, sp. n., Vaillant, t. c. p. 1, Gold Coast.

Seps monodactylus, Gthr., figured by Tristram, Fauna of Palestine, pl. xvi. fig. 4.

ANELYTROPIDÆ.

Typhlothalmus, n. n. for *Typhline*, Wiegman; Rochebrune, Rept. Sénégal. p. 130 [= *Anelytrops*, Cope].

CHAMÆLEONTIDÆ.

Chamaleon biteniatus, sp. n., Fischer, JB. Hamb. wiss. Anst. i. p. 23, pl. ii. fig. 7, Plateau of Naiwasha, Massai District.

Rhampholeon kersteni, Pters., figured by Fischer, Abh. Ver. Hamb. viii. pl. vii. fig. 2.

MOSASAURIDÆ.

A short review of the state of our knowledge of the *Mososauridæ*; L. Dollo, Rev. Quest. Sci. viii. pp. 648-653.

INCERTÆ SEDIS.

Notiosaurus dentatus, g. & sp. nn., for teeth from Pleistocene Deposits, New South Wales; Owen, Phil. Tr. clxxv. p. 249, pl. xii.

OPHIDIA.

LACERDA, J. B. DE. Leçons sur le Venin des Serpents du Brésil et sur la méthode de traitement des morsures venimeuses par le Permanganate de Potasse. Rio Janeiro: 1884, 8vo, xvii. & 194 pp., 3 pls.

MACALLUM, A. B. The Nasal Region in *Eutenia*. P. Canad. Inst. i. [1883] pp. 390-404, pl. i.

A description of the organ of Jacobson and of the nasal cavity, lachrymal duct, &c.

WHITE, C. A. On the Character and Function of the Epiglottis in the Bull Snake (*Pityophis*). Am. Nat. xviii. pp. 19-21, woodcut.

C. C. HOPLEY, *tom. cit.* pp. 732 & 733, also makes remarks on this subject.

STENOSTOMATIDÆ.

Stenostoma affine, sp. n., Boulenger, Ann. N. H. (5) xiii. p. 396, Venezuela.

BOIDÆ.

Aspidoboa, g. n., of the tribe *Chondropythônina*. Characterized by the absence of premaxillary teeth; distinguished from *Chondropython* by the large shields covering the head. For *Python curtus*, Hubr. Sauvage, Bull. Soc. Philom. (7) viii. p. 143.

TORTRICIDÆ.

Leptophrura petiti, sp. n., Sauvage, Bull. Soc. Z. Fr. ix. p. 202, pl. vi. fig. 4, Congo [= *Calubaria fusca*, Gray.—REC.].

COLUBRIDÆ.

Rhynchocalamus melanocephalus, Gthr., figured by Tristram, Fauna of Palestine, pl. xvi. fig. 1.

Enicognathus joberti, sp. n., Sauvage, Bull. Soc. Philom. (7) viii. p. 146, Marajo, Amazons.

Elapoides annulatus, sp. n., *id. t. c.* p. 144, Sumatra.

Uriechis concolor, sp. n., Fischer, JB. Hamb. wiss. Anst. i. p. 4, pl. i. fig. 1, Aruscha, foot of Kilimanjaro.

Coronella girundica, Daud.: on this species in captivity; J. v. Fischer, Zool. Gart. xxv. pp. 145-148. *C. inornata*, sp. n., Fischer, *t. c.* p. 6, pl. i. fig. 2, Aruscha, foot of Kilimanjaro.

Rhinechis scalaris, Schinz. On the habits of this species in captivity; J. v. Fischer, *t. c.* pp. 364-368.

Heterodon madagascariensis. Notes on its oophagous habits; Desguez, Bull. Soc. Philom. (7) viii. pp. 180 & 181, and Vaillant, *t. c.* p. 182.

Coryphodon alternatus, sp. n., Bocourt, Bull. Soc. Philom. (7) viii. p. 133, Isthmus of Darien.

Tropidonotus davidi, sp. n., Sauvage, Bull. Soc. Philom. (7) viii. p. 144, China. *T. variegatus* and *angusticeps*, spp. nn., Macleay, P. Linn. Soc. N. S. W. viii. p. 433, Queensland.

Helicops lineofuscatus, sp. n., Sauvage, Bull. Soc. Z. Fr. ix. p. 203, pl. vi. fig. 3, Congo. *H. bifrenatus*, sp. n., Bocourt, *t. c.* p. 194, Colon, Vera Paz.

Meleophis, g. n. Homalopsid.: body slightly compressed; head little distinct; dentition opisthoglyphe; pupil vertical; nasal single; anal and caudal shields divided; scales smooth; 4 frontals + 1 internasal. *H. flavescens*, sp. n., F. Müller, Verh. Ges. Basel, vii. p. 286, pl. v. fig. 2, East Indies?.

Leptophis varius, sp. n., Fischer, JB. Hamb. wiss. Anst. i. p. 36, pl. iii. fig. 8, Madagascar.

Philothamnus, sp. affin. *irregularis*, Leach, described; *id. t. c.* p. 11, Aruscha, foot of Kilimanjaro.

Dendrophis bilorealis, sp. n., Macleay, P. Linn. Soc. N. S. W. viii. p. 433, Herbert River, Queensland.

Psammophis biseriatus, Pters., described and figured by Fischer, *t. c.* p. 13, pl. i. fig. 4, from Kilimanjaro. *P. sibilans* var. n. *intermedius*; *id. t. c.* p. 14, Aruscha, foot of Kilimanjaro.

Caelopeltis insignitus, Geoffr. M. H. Peracca & C. Deregibus have discovered this snake to be poisonous, although the effects of its bite appear to be fatal only to small animals, such as lizards, birds, mice, etc.; Arch. Ital. Biol. v. pp. 108 & 109; Biol. Centralbl. iv. pp. 48 & 49. The same species figured by Tristram, Fauna of Palestine, pl. xiv.

Rhagerrihis productus, Pters., described from Persia; J. A. Murray, Ann. N. H. (5) xiv. p. 104, woodcut.

Acontiophis paradoxa, Gthr., inhabits Sind; *id. t. c.* p. 110.

Coronella bachmanni, Weyenb., = *Oxyrrhopus rhombifer*, D. & Berg, Act. Ac. Cord. v. p. 95.

Heterolepis bicarinatus, D. & B., recharacterized by Sauvage, Bull. Soc. Philom. (7) viii. p. 145.

Herbertophis, g. n., referred to the *Coronellinae*, for *H. plumbeus*, sp. n., Macleay, P. Linn. Soc. N. S. W. viii. p. 434, Queensland [= *Lielaphis modestus*, Schleg.—REC.].

Leptognathus viguieri, p. 136, Isthmus of Darien, *sexscutatus*, p. 137,

Attitlan, Guatemala, *leucostomus*, p. 138, Yucatan, and *semicinctus*, p. 139, Alta Vera Paz, spp. nn., Bocourt, Bull. Soc. Philom. (7) viii. *L. andrei* [-*ai*], sp. n., Sauvage, Bull. Soc. Philom. (7) viii. p. 146, Colombia.

Petalognathus multifasciatus (Jan, MS.), sp. n., Bocourt, t. c. p. 139, Vera Paz. The new generic term *Asthenognathus* proposed for the latter species; *id. t. c. p. 141*.

Comastes ornatus, sp. n., *id. t. c. p. 141*, Isthmus of Darien.

Dipsadomorus fasciatus, sp. n., *id. t. c. p. 195*, Yucatan. *D. albifrons*, sp. n., Sauvage, t. c. p. 145, Brazil.

Eteirodipsas wieneri, sp. n., Sauvage, t. c. p. 146, Ecuador.

Dipsina rubropunctata, sp. n., Fischer, JB. Hamb. wiss. Anst. i. p. 7, pl. i. fig. 3, Aruseha, foot of Kilimanjaro.

ELAPIDÆ.

Hoplocephalus par, sp. n., Boulenger, P. Z. S. 1884, p. 210, Solomon Islands.

Aspidelaps bocagei, sp. n., Sauvage, Bull. Soc. Z. Fr. ix. p. 204, pl. vi. fig. 2, Congo.

Naja haje. On its occurrence in Tunis; Valery Mayet, C.R. xcvi. p. 1296.

Ophiophagus ikaheka var. n. *fasciatus*; Fischer, Abh. Ver. Hamb. viii. p. 10, pl. vii. fig. 3, Aru Islands.

HYDROPHIIDÆ.

Hydrophis bishopi, p. 391, pl. —, and *guentheri* (= *gracilis*, Shaw), p. 396, pl. —, spp. nn., Murray, Zool. Sind, Coast of Sind.

VIPERIDÆ.

Vipera aspis and *V. berus*: on the distribution of the vipers in Switzerland; F. Müller, Verh. Ges. Basel, vii. pp. 300-324. *V. xanthina*, Gray, figured by Tristram, Fauna of Palestine, pl. xv.

Echis carinata, Merr., figured by Murray, Zool. Sind, pl. —.

Bothrops atrox, Wagl., renamed *B. jararacussu*; Lacerda, Leçons sur le Venin des Serpents, p. 8. *B. urutu*, sp. n., *id. t. c. p. 11*, pl. i., Brazil.

BATRACHIA.

E. D. COPE, Am. Nat. xviii. p. 26, divides the Class *Batrachia* into the following Orders:—

1. Supraoccipital, intercalare, and supratemporal bones present.
 Propodial bones distinct. (Extinct.)
 Vertebral centra, including atlas, segmented, one set of segments
 together supporting one arch *Rhachitomi*.
 Vertebrae segmented, the superior and inferior segments each
 complete, forming two centra to each arch . . . *Embolomeri*.
 Vertebral centra, including atlas, not segmented; one to each
 arch *Stegocephali*.

- II. Supraoccipital and supratemporal bones wanting. Frontal and propodial bones distinct.

a. An os intercalare.

A palatine arch and separate caudal vertebræ. *Proteida*.

aa. No os intercalare.

A maxillary arch; palatine arch imperfect; nasals, premaxillaries and caudal vertebræ distinct. *Urodela*.

Maxillary and palatine arches distinct; nasals and premaxillaries united. . . . *Gymnophiona*.

No maxillary or palatine arches; nasals and premaxillary, also caudal vertebræ, distinct. *Trachystomata*.

- III. Supraoccipital, intercalare and supratemporal bones wanting.

Frontals and parietals connate; propodial bones and caudal vertebræ confluent. Premaxillaries distinct from nasals; no palatine arch; astragalus and calcaneum elongate, forming a distinct segment of the limb. . . . *Anura*.

The author also gives a genealogical scheme.

Remarks upon this paper by L. Dollo, Bull. Mus. Belg. iii. pp. 85-90.

G. CALMELS has further investigated the poison of Batrachians; C.R. xviii. pp. 536-539. Also an observation by A. GAUTIER & ÉTARD, *l. c.* p. 631.

CAMERANO, L. Ricerche intorno alla vita branchiale degli Anfibi. Mem. Acc. Tor. (2) xxxv. pp. 395-466, pls. i. & ii.

—. Intorno alla Neotenia ed allo Sviluppo degli Anfibi. Atti Acc. Tor. xix. pp. 84-93.

—. Sur le développement des Amphibies et sur ce que l'on a nommé chez eux la Néoténie. Arch. Ital. Biol. v. pp. 27 & 28.

—. Recherches sur la prolongation de la période branchiale des Amphibies. Arch. Ital. Biol. v. pp. 29-36.

HERTWIG, O. Über das Vorkommen spindeligter Körper im Dotter junger Froscheier. Morph. JB. x. pp. 338-343, pl. xiv.

KOLLMANN, J. Die Anpassungsbreite der Batrachier und die Correlation der Organe. Zool. Anz. vii. pp. 266-270.

On the retention of larval characters, or 'Neotenie.'

—. Das Ueberwintern von europäischen Frosch- und Tritonlarven und die Umwandlung des mexikanischen Axolotl. Verh. Ges. Basel, vii. pp. 387-398; abstract in C.R. Ass. Fr. Sci. xii. pp. 567-570, with remarks by F. Lataste, pp. 570 & 571.

—. L'hivernage des larves de Grenouilles et de Tritons d'Europe, métamorphose de l'Axolotl du Mexique. Rec. Z. Suisse, i. pp. 75-81.

SCHIEFFERDECKER, P. Zur Kenntniss des Baues der Schleimdrüsen. 1. Einzellige Schleimdrüsen in der Blase der Amphibien. Arch. mikr. Anat. xxiii. pp. 382-393, pls. xix. & xx.

SCHIFF, M. Remarques sur l'innervation des cœurs lymphatiques des Batraciens Anoures. Rec. Z. Suisse, i. pp. 319-355.

SPENGEL, J. W. Zwitterbildungen bei Amphibien. Biol. Centralbl. iv. pp. 235-241.

— Hermaphroditismus bei Amphibien. T. c. pp. 268-270.

WILL, L. Über die Entstehung des Dotters und der Epithelzellen bei den Amphibien und Insecten. Zool. Anz. vii. pp. 272-276 & 288-291.

ECAUDATA.

F. BAYER has notes on the anatomy of Müller's *Pelobatida*, which he proposes to divide according to the degree of ossification of the skull, *Bombinator* and *Alytes* forming a family, *Bombinatorida*, widely remote from the *Pelobatida* (g. *Pelobates*). Unfortunately, the author entirely ignores the researches of Cope, Lataste, and others. Abh. böhm. Ges. (4) xii. 24 pp., 2 pls. (In Bohemian, with a German résumé.)

BORN, G. Ueber den Einfluss der Schwere auf das Froschei. Breslauer ärztliche Zeitschrift, April, 1884, 14 pp.

— Ueber die inneren Vorgänge bei der Bastardbefruchtung der Froscheier. T. c. No. 16, 10 pp.

BOURNE, A. G. On certain Abnormalities in the Common Frog (*Rana temporaria*). 1. The Occurrence of an Ovotestis. 2. Abnormalities of the Vertebral Column. Q. J. Micr. Sci. xxiv. pp. 83-88, pl. iv.

GAD, —. Ueber Leistungsbahnen und Centren im Rückenmark des Frosches. SB. Ges. Würzb. 1884, pp. 52 & 53.

HILGENDORF writes on the ileo-sacral articulation in the *Aglossa* (*Pipa* and *Xenopus*); SB. nat. Fr. 1884, pp. 35-38.

LIST, H. Über Becherzellen im Blasenepithel des Frosches. Zool. Anz. vii. p. 328.

MARSHALL, A. M. On certain abnormal conditions of the Reproductive Organs in the Frog. J. Anat. Phys. xviii. pp. 121-144, pls. vi. & vii.

POHL-PINCUS, —. Ueber die Muskelfasern des Froschherzens. Arch. mikr. Anat. xxiii. pp. 500-505.

SCHWEGMANN, F. J. Entstehung und Metamorphose der Wirbelsäule von *Rana temporaria*. Z. f. Naturw. (4) iii. pp. 641-671, pls. viii. & ix.

STIRLING, W., & MACDONALD, J. F. The Minute Structure of the Palatine Nerves of the Frog, and the Termination of Nerves in Blood-vessels and Glands. J. Anat. Phys. xvii. pp. 293-307, pl. xiii.

CERATOBATRACHIDÆ.

A new family, occupying in the series *Firmisternia* the place which the *Hemiphractidæ* occupy in the *Arcifera*, and characterized by the presence of teeth in both jaws, and by the diapophyses of the sacral vertebra not being dilated. *Ceratobatrachus guentheri*, g. & sp. nn., Boulenger, P. Z. S. 1884, p. 212, Solomon Islands.

RANIDÆ.

Rana esculenta : on the origin of the edible frog in England ; Boulenger, Zool. xlii. pp. 265-269. *R. fortis*, subsp. n., *id. t. c.* p. 220, Berlin [= *R. ridibunda*, Pall.—REC.]. *R. corrugata*, Ptrs., occurs only in Ceylon ; *id. Ann. N. H.* (5) xiv. p. 387. *R. erythraea*, Schleg.: on the male's secondary sexual characters; *id. t. c.* p. 387. *R. bufoniformis*, p. 10, *guppyi* and *opisthodon*, p. 11, spp. nn., *id. P. Z. S.* 1884, Solomon Islands. *R. masoni*, sp. n., *id. Ann. N. H.* (5) xiii. p. 397, Java.

Tomopterna strachani, sp. n., Murray, Zool. Sind, p. 399, Sind.

Cornufer guppyi, p. 11, and *solomonis*, p. 12, spp. na., Boulenger, P. Z. S. 1884, Solomon Islands. *C. intermedius*, sp. n. ?, F. Müller, Verh. Ges. Basel, vii. p. 277, Fiji.

Phrynobatrachus monticola, sp. n., Fischer, JB. Hamb. wiss. Anst. i. p. 26, Massai District.

Prostherapis femoralis, sp. n., Boulenger, P. Z. S. 1883, p. 635, pl. lvii. fig. 1, Huallaga River.

DENDROBATIDÆ.

Dendrobates reticulatus, p. 635, pl. lvii. fig. 2, *fantasticus*, p. 636, fig. 3, and *hahneli*, p. 636, fig. 4, spp. nn., Boulenger, P. Z. S. 1883, Huallaga River.

ENGYSTOMATIDÆ.

Microhyla fissipes, sp. n., Boulenger, Ann. N. H. (5) xiii. p. 397, Formosa.

Rhombophryne, Boettg. The osteological characters given by Boulenger, *op. cit.* xiv. p. 388, fig.

Breviceps, Merr. Remark on the pectoral arch of a specimen figured by Parker ; *id. ibid.*

CYSTIGNATHIDÆ.

Pseudis. Remarks on the larva of this Batrachian, with special reference to Pizarro's *Batrachichthys* ; Brauner, Science, iii. p. 376.

Ceratophrys cristiceps, sp. n., F. Müller, Verh. Ges. Basel, vii. p. 279, pl. v., Brazil.

Phyllobates trilineatus, sp. n., Boulenger, P. Z. S. 1883, p. 636, pl. lviii. fig. 1, Huallaga River.

Leptodactylus gracilis, D. & B., redescribed by Boulenger, Ann. N. H. (5) xiv. p. 389. *L. rhodomystax*, fig. 2, and *discodactylus*, fig. 3, spp. nn., *id. P. Z. S.* 1883, p. 637, pl. lviii., Huallaga River.

Limnodynastes lineatus, sp. n., De Vis, P. Linn. Soc. N. S. W. ix. p. 65, [= *L. peronii*.—REC.]. *L. olivaceus*, sp. n., *id. t. c.* p. 66, Queensland.

BUFONIDÆ.

Bufo calamita and *B. viridis* : Héron Royer, Bull. Soc. Z. Fr. ix. p. 29, points out a few additional characters as distinguishing these species. *B.*

viridis, Laur.: Murray, Ann. N. H. (5) xiv. p. 105, describes specimens fr Bushire, Persia. *B. mendocinus*, Phil., = *B. arenarum*, Hens.; Boulenger, Ann. N. H. (5) xiv. p. 389. *B. andersoni*, sp. n., Murray, Zool. Sind, p. 401, Sind [= *B. andersoni*, Blgr.—REC.]. *B. amoenus*, p. 12, pl. i. fig. 2, *neglectus*, p. 16, pl. iii. fig. 1, *sauvagei*, p. 18, pl. iii. fig. 2, and *buccinator*, p. 19, pl. iv. fig. 1, spp. nn., Rochebrune, Amph. Sènegamb., Senegambia. *B. alatus*, sp. n., Thominot, Bull. Soc. Philom. (7) viii. p. 151, Panama [= *B. typhonius*.—REC.].

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Phyllomcdusa perlata, sp. n., Boulenger, P. Z. S. 1883, p. 638, pl. lviii. fig. 4, Huallaga River.

PELOBATIDÆ.

Pelobates fuscus, Laur. On its occurrence in the Province Verona; Atti Ist. Ven. (6) ii. pp. 1455–1459.

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Platyops stuckenbergi, sp. n., Trautschold, Nouv. Mém. Ac. Mosc. xv. p. 10, pls. i.-v., Permian of Akbatürowa, River Kitjak, Wjatka.

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PISCES.

BY

W. R. OGILVIE-GRANT.

GENERAL.

AGASSIZ, A., & WHITMAN, C. O. Development of Pelagic Fish-Eggs. P. Am. Ac. xx. (1884) pp. 23-75, 1 pl. [Extr. J. R. Micr. Soc. (2) iv. pp. 863-865.]

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The results of the author's researches on the lateral nerve in Fishes differ very much from those obtained by Van Wijhe and Hoffmann, who have recently published papers dealing with the same question. This difference cannot be accounted for by a difference of material, as Hoffmann worked upon the same genus. The author is led to accept the conclusion of Balfour, that the lateral nerve arises just as all other nerves do, and not as a splitting off of a portion of the epiblast. The auditory organ is, like the segmental sense organs, shown to be really a modified portion of the epiblast. Very early in development it becomes shut off in a sac from the epidermis, a condition which only arises later in the segmental sense organs.

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Contains a list of 30 species.

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5 Blennies and 1 *Gobius* are described and figured.

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Contains notes on and figures of some of the Fishes which have not yet
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ASIA.

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KLUNZINGER, C. B. Die Fische des Rothen Meeres. Eine kritische Revision mit Bestimmungstabellen. I. Thiel. *Acanthopteri veri*, Owen. Stuttgart: 1884, fol., 133 pp., pls. i.-xiii.

A new subgenus (*Hyposerranus*), and 12 new specific names are made, 5 for new species and 7 for specimens which have been incorrectly identified.

PEREIRA-GUIMARÃES, A. R. Lista dos peixes da Ilha da Madeira, Açores e das possessões d'Africa, que existun no Museu de Lisboa. J. Sci. Lisb. xxxvii. pp. 11-28.

A list of 38 species, with notes and synonymy.

SAUVAGE, H. E. Note sur des Poissons de Franceville, Haute Ogooué. Bull. Soc. Z. Fr. ix. pp. 193-198.

3 species are described as new.

——. Notice sur une Collection de Reptiles et de Poissons recueillie à Majumba, Congo. T. c. pp. 199-208, pl. vi.

2 new species are described.

VINCIGUERRA, D. Materiali per lo Studio della Fauna Tunisina raccolti da G. e L. Doria. I. Pesci. Ann. Mus. Genov. xx. pp. 393-445.

A list of 79 species is given, with more or less extensive notes and a woodcut.

AMERICA.

BEAN, T. H., & DRESEL, H. G. A Catalogue of Fishes received from the Public Museum of the Institute of Jamaica, with descriptions of *Pomadasys approximans* and *Tylosurus euryops*, 2 new species. P. U. S. Nat. Mus. vii. pp. 151-170.

A list of 100 species is given. It has not been thought necessary to

redescribe such species as are well described in the Catalogue of the British Museum; references, therefore, are simply made to that work for such.

BEAN, T. H. Notes on a Collection of Fishes made in 1882 and 1883, by Capt. H. E. Nichols, in Alaska and British Columbia, with the description of a new genus and species, *Prionistius macellus*. P. U. S. Nat. Mus. vi. pp. 353-361.

A list of 48 species. [For new genus, see *Cottidae*.]

— Notes on some Fishes collected by James G. Swan in Washington Territory, including a new species of *Macrurus*. T. c. pp. 362-364.

A list of 11 species, with notes.

— Notes on Fishes observed at the head of Chesapeake Bay in the spring of 1882, and upon other species of the same region. T. c. pp. 365-367.

Notes on 31 species.

Bulletin of the United States Fish Commission (Washington: 1884), and United States Commission of Fish and Fisheries, Commissioner's Report for 1881 (Washington: 1884). Contain a mass of valuable information about American Food Fishes, &c., &c.

DRESEL, H. G. Notes on some Greenland Fishes. P. U. S. Nat. Mus. vii. pp. 244-258.

A list of 16 species, with notes.

GILBERT, C. H. A List of the Fishes collected in the East Fork of White River, Indiana, with descriptions of 2 new species. P. U. S. Nat. Mus. vii. pp. 199-205.

A list of 47 species is given, 2 of which, *Notropis boops* and *Nocomis hyostomus*, are described as new. A new genus, *Serraria*, for *Hadropterus scierus*, Swainson, is also created.

— Notes on the Fishes of Switz City Swamp, Greene County, Indiana. T. c. pp. 206-210.

A list of 14 species is given, with notes; 1 species (*Pacillichthys palustris*) is described as new.

GOODE, G. B., & BEAN, T. H. Notes on some Florida Fishes. P. U. S. Nat. Mus. vii. pp. 42-47.

JORDAN, D. S. List of Fishes from Egmont Key, Florida, in the Museum of Yale College, with descriptions of 2 new species. P. Ac. Philad. 1884, pp. 42-46.

A list of 22 species, with notes. *Cæcula bascanium* and *Myrionogymnotis* are described as new.

— Note on a Collection of Fishes from Pensacola, Florida, obtained by Silas Stearns, with descriptions of 2 new species (*Exocætus volador* and *Gnathypops mystacinus*). P. U. S. Nat. Mus. vii. pp. 33-40.

A list is given of the species thus far found by Stearns in the stomachs of the "Snappers" and "Groupers" on the "Snapper Banks" off Pensacola.

[JORDAN, D. S.] The Fishes of Florida Keys. Bull. U. S. Fish. Comm. iv. pp. 77-80.

The author gives notes on the Fishes observed during three weeks of active work, and makes some additions to Poey's list of names in use among Spanish fishermen.

— List of Fishes collected in Lake Jessup and Indian River, Florida, by Mr. R. E. Earll, with descriptions of 2 new species. P. U. S. Nat. Mus. vii. pp. 322-324.

Contains notes on 16 species, *Heterandria ommata* and *Elassoma evergladei* being described as new.

— Notes on Fishes collected at Guaymas, Mexico, by Mr. H. F. Emeric, with a description of *Gobiosoma histrio*, a new species. T. c. pp. 260 & 261.

— Notes on Species of Fishes improperly ascribed to the Fauna of North America. P. Ac. Philad. 1884, pp. 97-103.

The author gives a list of 35 species which should, in his opinion, be dropped from the lists of species inhabiting the waters of North America north of the Tropic of Cancer.

List of Fishes collected in the vicinity of New Orleans. P. U. S. Nat. Mus. vii. pp. 318-322.

Contains a list of 26 species, with notes.

— List of Fishes collected at Key West, Florida, with notes and descriptions. T. c. pp. 103-150.

A list of 171 species, of which 49 are new to the United States' Coast, is given, with the vernacular names used among the English-speaking fishermen of Key West, colour notes, and other descriptive items. In addition to the above, a list is given of 14 species on the authority of fishermen, and 39 recorded by other authors, so that the number of species of Fishes now known from Florida Keys is in all about 220. 1 species (*Narcine umbrosa*) is described as new to science.

—, & MEEK, S. E. List of Fishes observed in Saint John's River at Jacksonville, Florida. T. c. pp. 235-237.

A list of 16 species is given. The name *Paralichthys lethostigma* is proposed for *P. dentatus*, J. & G. (*nec* Linn.), *vide* Bean.

—, & SWAIN, J. Notes on Fishes collected by David S. Jordan at Cedar Keys, Florida. P. U. S. Nat. Mus. vii. pp. 230-234.

Wootton, J. H. Notes on 41 species.

—, & JAM, C. H. The Fish of Lake Champlain. Bull. U. S. Fish. Comm. iv. pp. 287 & 288.

A list and notes on the (9) most important Food Fishes.

ROOSEVELT, R. B. The Game Fish of the Northern States and British Provinces, with an account of the Salmon and Sea-Trout Fisheries of Canada and New Brunswick. &c. New York & London : 1884, 12mo.

[ROOSEVELT, R. B.] Superior Fishing; or, the Striped Bass, Trout, Black Bass, and Blue Fish of the Northern States. London & New York: 1884, 12mo.

STEINDACHNER, F. Zur Fisch-Fauna des Cauca und der Flüsse bei Guayaquil. Denk. Ak. Wien, xlii. (1880) pp. 3-52, pls. i.-ix. [Omitted from Zool. Rec. xvii.]

Pt. i. "Fische des Cauca," the largest neighbouring river to the Magdalena.

Pt. ii. "Ueber einige Fisch-Arten aus den Flüssen und brackischen Gewässern um Guayaquil."

Contains notes on or descriptions of about 62 species, many of which are figured. 11 species are described as new.

AUSTRALIA AND POLYNESIA.

DE VIS, C. New Australian Fishes in the Queensland Museum. P. Linn. Soc. N. S. W. ix. Part i. (pp. 389-400) contains descriptions of 4 genera and 21 species supposed to be new. Part ii. (pp. 453-462), descriptions of 17 new species. Part iii. (pp. 537-547), descriptions of 23 new species. Part iv. (pp. 685-698), descriptions of 29 new species.

— . Fishes from South Sea Islands. *Op. cit.* viii. pp. 445-457.
3 genera and 29 species are described as new.

GÜNTHER, A. Report on the Zoological Collections made in the Indo-Pacific Ocean during the Voyage of H.M.S. 'Alert,' 1881-2. London: 1884, 8vo, Fishes, pp. 29-33, pl. iii.

HECTOR, J. The Fisheries of New Zealand. Bull. U. S. Fish. Comm. iv. pp. 53-55.

Contains a list of (47) species commonly met with in the market.

JOHNSTON, R. M. Notice of Recent Additions to the List of Tasmanian Fishes. P. R. Soc. Tasm. 1884, pp. 193-195.

1 species, *Olistherops brownii*, is described as new.

MACLAY, N. DE M., & MACLEAY, W. *Plagiostomata* of the Pacific. Part ii. P. Linn. Soc. N. S. W. viii. pp. 426-431, pl. xx.

A supplement to their former paper, in which the authors describe the Japanese *Heterodontus* as a distinct species, under the name *H. japonicus*.

MACLEAY, W. Supplement to the Descriptive Catalogue of the Fishes of Australia. P. Linn. Soc. N. S. W. ix. pp. 2-64.

A number of known species are added to those already given, and new ones described as new.

— . Some Results of Trawl Fishing outside Port Jackson. *Op. cit.* viii. pp. 457-462.

2 species, *Lepidotrigla mulhalli* and *Raja australis*, are described as new.

STEINDACHNER, F. Ichthyologische Beiträge (xiii.). SB. Ak. Wien, lxxxviii. pp. 1065-1113, pls. i.-vii.

I. Beiträge zur Kenntniss der Fische Australiens. II. *Caranx africanus*. III. *Macrones chinensis*. Full descriptions, and in most cases figures, are given of several species which were briefly characterized in Anz. Ak. Wien, 1883. 2 new genera, *Parapercis* (*Trachinidæ*) and *Peronedys* (*Blennidæ*), and 4 new species, are also described.

PALÆONTOLOGY.

BASSANI, F. Ueber zwei Fische aus der Kreide des Monte S. Agata im Görzischen. JB. geol. Reichsanst. xxxiv. pp. 403-406, pl. ix.

The author refers the specimens to the genera *Calodus*, Heck., and *Elopopsis*, Heck.

CLAYPOLE, E. W. Preliminary Note on some Fossil Fishes recently discovered in the Silurian Rocks of North America. Am. Nat. xviii. pp. 1222-1226.

DAVIS, J. W. On some Remains of Fossil Fishes from the Yoredale Series at Leyburn in Wensleydale. J. G. Soc. xl. pp. 614-634, pls. xxvi. & xxvii. [See *Selachoidæ*.]

SE, C. Einige seltene palæontologische Funde. Palæontogr. (3) vii. pp. 3-10, pls. i. & ii.

Descriptions and figures of fossil remains of Selachians and *Batoidei*, 2 of which are new.

JENTZSCH, —. Ueber die fossilen Fischreste des Provinzialmuseums. (Sep. copy.) Ex. SB. Ges. Königsb. 1883 (3 pp.).

KOKEN, E. Ueber Fisch-Otolithen, insbesondere über diejenigen der norddeutschen Oligocæn Ablagerungen. Z. geol. Ges. xxxvi. pp. 500-565, pls. ix.-xii.

Otoliths referred to the following species are described and figured :—

Clupea harengus, *Fierasfer acus*, *Rhombus maximus*, *Solea vulgaris*, *Merlucius esculentus*, *Lota fluviatilis*, *Gadus* sp., *Gadus morrhua*, *Perca fluviatilis*, *Lucioperca sandra*, *Serranus cabrilla*, *Apogon rex mullorum*, *Trachinus draco*, *Trigla aspera*, *Peristedion cataphractum*, *Scorpena porcus*, *Corvina nigra*, *Collichthys lucidus*, *Mullus surmuletus*, *Smaris vulgaris*, *Sargus rondeletii* and *S. annularis*, *Box boops* and *B. salpa*, *Pagellus* *yrus*, *Lepidopus caudatus*, *Gobius niger*, with many others which the No has not been able to determine specifically.

WESTER, E. R. Report on Fragments of Fossil Fishes from the Palæozoic Strata of Spitzbergen. Sv. Ak. Handl. xx. No. 9, 7 pp., pls. i.-iv.

LOHEST, M. Recherches sur les Poissons des Terrains Paléozoïques de Belgique. Poissons de l'Ampélite alunifère, des genres *Campodus*, *Petrodus*, et *Xystracanthus*. Ann. Soc. Géol. Belg. xi. pp. 295-325, pls. iii.-v.

TRAQUAIR, R. H. Notice of New Fish Remains from the Black-band Ironstone of Borough Lee, near Edinburgh. No. v. Geol. Mag. (3) i. pp. 64 & 65.

Contains a description of a new genus and species, *Aganacanthus striatulus*.

TRAUTSCHOLD, H. Ueber *Edestus* und einige andere Fischreste des Moskauer Bergkalks. Bull. Mosc. 1883, pt. 3, pp. 160-173, pl. v.

A new genus and 3 new species (*Selachoides*) are described and figured.

WOODWARD, A. S. Chapters on Fossil Sharks and Rays. Sci. Goss. 1884, pp. 172-174, 227-230, 267-272, woodcuts.

In this paper the author gives a summary of the present state of knowledge of this branch of palæontology, with references to the more important literature.

PALÆICHTHYES.

CHONDROPTERYGII.

SELACHOIDEI.

GARMAN, S. New Sharks: *Chlamydoselachus anguineus* and *Heptancha pectorosus*. Bull. Essex Inst. xvi. pp. 3-15, 1 pl.

[Recorded from a separate copy.]

HASWELL, W. A. Studies on the Elasmobranch Skeleton. P. Linn. Soc. N. S. W. ix. pp. 71-117, pls. i. & ii.

Contains descriptions of and figures of parts of the following species:—*Carcharodon rondeletii*, *Heptanchus indicus*, *Crossorhinus barbatus*, *Pristiophorus cirratus*, *Trygon pastinaca*, *Urolophus* sp. ?, *Hypnos subniger*, and *Trygonorhina fasciata*. A summary is added in which are enumerated the principal characteristics of the skeleton in such families of the *Plagiostomi* as the author has had the opportunity of examining.

LIST, J. H. Das Cloakenepithel von *Scyllium canicula*. Zool. Anz. vii. pp. 545 & 546.

ÓNODI, A. D. Ueber die Entwicklung der Spinal-ganglien und der Nervenwurzeln. Math. Nat. Ber. Ung. ii. pp. 310-336, pl. x.

With special reference to the development in the embryos of *Pristiurus melanostomus*, *Scyllium canicula*, and *Torpedo marmorata*.

PERRAVEX, M. E. Sur la Formation de la coque des œufs du *Scyllium canicula* et du *S. catulus*. C.R. xcix. pp. 1080-1082. [Extract in Mém. Micr. Soc. (2) v. p. 425.]

*ROSENBERG, E. Untersuchungen über die Occipitalregion des Craniums und den proximalen Theil der Wirbelsäule einiger Selachier. Festschrift. (F. H. Bidder's Doctorjubiläum). Dorpat: 1884, 4to, 26 pp., 2 pls.

VAILLANT, L. Remarques sur l'orientation des œufs dans l'utérus chez les poissons Elasmobranches ovipares. Bull. Soc. Philom. (7) viii. pp. 178 & 179.

Cladacanthus paradoxus, Agass. (= *Erismacanthus jonesi*, McCoy), (foss.), figured; Davis, J. G. Soc. xl. pl. xxvi. figs. 1-5.

Physonemus hamatus, Agass. (foss.), figured; *id. t. c.* pl. xxvi. fig. 6.

Gomphacanthus, g. n. (foss.), for *G. acutus*, sp. n., *id. t. c.* p. 618, pl. xxvi. fig. 9, Yoredale series, near Leyburn.

Cladodus mucronatus, Davis, fig. 10, and *hornei*, Davis, fig. 11 (foss.), *id. t. c.* pl. xxvii.

Hemicladodus, g. n. (foss.), for *H. uncuspidatus*, sp. n., *id. t. c.* p. 620, pl. xxviii. figs. 24 & 24a, Yoredale series, near Leyburn.

Pristicladodus dentatus, McCoy, pl. xxvii. fig. 4, and *concinus*, Davis, pl. xxvi. fig. 15 (foss.), *id. t. c.*

Glyphanodus tenuis, Davis (foss.), *id. t. c.* pl. xxvii. fig. 8.

Petalodopsis tripartitus, Davis (foss.), *id. t. c.* pl. xxvi. fig. 16.

Polyrhizodus colei, Dav. (foss.), *id. t. c.* pl. xxvii. fig. 13.

Pristodus falcatus, Ag. (foss.), *id. t. c.* pl. xxvi. figs. 19 & 20.

Copodus cornutus, Ag. (foss.), *id. t. c.* pl. xxvii. fig. 22.

Ctenopelatus crenatus, Dav. (foss.), *id. t. c.* pl. xxvii. fig. 18.

Diclitodus scitulus, Dav. (foss.), *id. t. c.* pl. xxvii. fig. 12.

Pleuroodus woodi, Dav. (foss.), *id. t. c.* pl. xxvii. figs. 14-17.

Petalodus acuminatus, Ag. (foss.), *id. ibid.* pl. xxvi. fig. 10.

Catodus lamelliformis, sp. n. (foss.), *id. t. c.* p. 625, pl. xxvii. fig. 23, Yoredale series, near Leyburn.

Scilodus corrugatus, Dav. (foss.), *id. ibid.* pl. xxvii. fig. 21.

Sandalodus minor, sp. n. (foss.), *id. t. c.* p. 626, pl. xxvi. fig. 17, Yoredale series, near Leyburn.

Lophodus reticulatus, Dav., pl. xxvii. fig. 2, *lavis*, Dav., pl. xxvii. fig. 19, and *bifurcatus*, Dav., pl. xxvii. fig. 6, *concinus*, p. 627, pl. xxvi. fig. 18, and *angularis*, p. 628, pl. xxvii. fig. 25, spp. nn., *id. t. c.*, Yoredale series (foss.).

Delloptychius plicatus, sp. n. (foss.), *id. t. c.* p. 628, pl. xxvi. figs. 13 & 14, Yoredale series, near Leyburn.

Astrabodus, g. n. (foss.), for *A. expansus*, sp. n., *id. t. c.* p. 630, pl. xxvi. figs. 11 & 12, Yoredale series, near Leyburn.

Cyrtanodus, g. n. (foss.), for *C. gibbus*, sp. n., *id. t. c.* p. 631, pl. xxvii. figs. 1 & 6, Yoredale series, near Leyburn.

Echinodus, g. n. (foss.), for *E. paradoxus*, sp. n., *id. ibid.* pl. xxvii. fig. 7, Yoredale series, near Leyburn.

Diplacodus, g. n. (foss.), for *D. bulboides*, sp. n., *id. t. c.* p. 633, pl. xxvii. fig. 20, Yoredale series, near Leyburn.

Macracanthus, Ag. (foss.). Notes on, with more detailed accounts

Macracanthus nobilis and *youngi*, Traquair; Traquair, Ann. N. H. (5) xiii. 18.

Macracanthus striatulus, g. & sp. nn. (foss.), *id. Geol. Mag.* (3) i. p. 64, Black-band Ironstone of Borough Lee, near Edinburgh.

Ctenacanthus costellatus, sp. n. (foss.), *id. t. c.* p. 3, pl. ii., Lower Carboniferous Rocks of Eskdale, Dumfriesshire.

Pleuracanthus (foss.). Notes by Cope, Am Nat. xviii. p. 818, pl. xxiii.

Didymodus (foss.). On the structure of the skull in this genus; *id. P. Am. Phil. Soc.* xxi. pp. 572-589, pl.

Didymodus compressus, Newb., and *platypterus*, sp. n. (foss.), noted and figured; Cope, Am. Nat. xviii. p. 818, pl. xxiii.

Chlamydoselachus, g. n. Type of a new family, *Chlamydoselachidae*, for *C. anguineus*, sp. n., Garman, Bull. Essex Inst. xvi. pp. 3-11, pl., Japanese Seas.

Chlamydoselachus, Garm., = *Didymodus*, Cope; Cope, t. c. p. 412.

Leptocarcharias = *Triacis*; Hilgendorf, SB. nat. Fr. 1884, p. 138.

Pseudotriacis microdon, from Amagansett, N.Y.; Baird, Bull. U. S. Fish. Comm. iv. p. 177.

Lamna guentheri, sp. n., Murray, Ann. N. H. (5) xiii. p. 349, Kurrachee.

Otodus woodwardi, sp. n. (foss.), Hasse, Palæontogr. (3) vii. p. 8, pl. ii. figs. 13-15, Upper Greensand, Cambridge.

Carcharodon longidens, sp. n. (foss.), Pillet, Mém. Ac. Savoie, (3) ix. pp. 277-283, 1 pl., Upper Chalk of Haute-Savoie. *C. carcharias*: notes and figure by Stevenson, Am. Nat. xviii. p. 940, pl. xxxi., woodcut.

Alopias vulpes, M. & H. Notes and table of measurements; Parona, Atti Soc. Mod. (3) i. 1883, pp. 99-104.

Selache davisi, sp. n., figs. 16 & 17, Chalk of Dorking, and *S.* sp., fig. 18, Oligocene of Palmnicken, Hasse, t. c. p. 9, pl. ii. (foss.).

Heptanchus indicus. Note on claspers; Haswell, P. Linn. Soc. N. S. W. ix. p. 381, pl. x.

Heptanchius pectorosus, sp. n., Garman, Bull. Essex Inst. xvi. p. 1, Patagonia.

Scyllium edwardsi, figs. 10 & 11, Chalk of Dorking, and *catulus*, fig. 12, Oligocene of Palmnicken, Hasse, t. c. p. 7, pl. ii. (foss.).

Campodus agassizianus, Kon. (foss.), described and figured; Lohest, Ann. Soc. Géol. Belg. xi. p. 295, pls. iii. figs. 1-3, & iv. figs. 1-4, woodcut.

Agassizodus variabilis, St. J. & Worth. (foss.). Extensive notes and woodcuts illustrating the jaw of this species restored; *id.* t. c. p. 305, three woodcuts.

Petrodus, McCoy (foss.), ? = *Ostinaspis*, Trautsch., note, p. 316; *P. patelliformis*, McC., described and figured: *id.* t. c. p. 318, pls. iii. figs. 4-6, and v. fig. 1.

Xystracanthus, Leidy (foss.). Notes on this genus, p. 319; *X. konnicki*, sp. n.: *id.* t. c. p. 322, pl. v. figs. 2 & 3, Ampélite alunifère of Belgium.

Edestus minor, Newb., *vorax*, Leidy, p. 161, woodcut, and *protopirata*, sp. n. (foss.), p. 160, pl. v. figs. 1 & 2. Notes by Trautschold, Bull. Mosc. 1883, pt. 3, Mountain chalk of Moscow.

Cymatodus reclinatus, sp. n. (foss.), *id.* t. c. p. 169, pl. v. figs. Mountain chalk of Moscow.

Pacilodus undatus, sp. n. (foss.), *id.* t. c. p. 170, pl. v. figs. 5 & 6, Mountain chalk of Moscow.

Euacanthus, g. n. (foss.), p. 171, for *E. margaritatus*, sp. n., *id.* t. c. p. 172, pl. v. figs. 7-13, Mountain chalk of Moscow.

* This specific name ought to be spelt *daviesi*, as the author says it is in honour of Mr. Davies, of the British Museum.

Heterodontus japonicus, sp. n., Macleay & Macleay, P. Linn. Soc. N. S. W. viii. p. 428, pl. xx., Japan.

Cestracion (*Acrodus*) sp. (foss.), Hasse, t. c. p. 6, pl. ii. figs. 8 & 9, Lias of Lyme Regis.

Acanthias vulgaris. Note on a female specimen devoured by *Isopoda*; Day, P. Z. S. 1884, p. 44.

Centrophorus sp. (foss.), Hasse, t. c. p. 1, pl. i. fig. 1; Chalk of Lebanon.

Echinorhinus spinosus. On its occurrence in New Zealand waters; Parker, Tr. N. Z. Inst. xvi. p. 280.

BATOIDEI.

*FRITSCH, G. Die elektrischen Fische im Lichte der Descendenzlehre. Berlin: 1884, 8vo.

*——. Ueber die vergleichende Anatomie der elektrischen Organe und Nerven. Amtl. Ber. lvi. Vers. deutsch. Naturf. u. Ärzte, Freiburg. i. Br., 1883 (1884), pp. 138-140.

——. Ergebnisse der Vergleichen an den elektrischen Organen der Torpedineen. SB. Ak. Berl. 1884, pp. 445-456.

VINCENZO, C. G. Nota sopra la terminazione delle fibre nervose motrici, ne' muscoli striati delle Torpedini condizionati col doppio cloruro d'ovo e cadmio. Rend. Acc. Bologn. 1883, pp. 18-22.

WEYL, T. Physiologische und Chemische Studien an Torpedo. Arch. Anat. Phys. (Phys.) 1884, pp. 316-324.

Squaloraja polyspondyla (foss.), Hasse, Palæontogr. (3) vii. p. 4, pl. i. figs. 2 & 3, Oligocene of Palmnicken.

Pristis woermanni, sp. n., Fischer, JB. Hamb. i. p. 39, W. Africa.

Rhinobatus halavi, Rüpp., redescribed; Doderlein, Nat. Sicil. iii. p. 169. Note by Vinciguerra, Ann. Mus. Genov. xx. p. 412.

Torpedo sp. (foss.), Hasse, t. c. p. 5, pl. i. figs. 6 & 7, Oligocene of Palmnicken. *T. nobiliana*, Bonap.; Ewart, Rep. Scot. Fisheries, ii. App. F, No. vii. p. 79, pl. xi. *T. fusca*, ? sp. n., Parker, Tr. N. Z. Inst. xvi. p. 283, pl. xxii., Dunedin.

Narcine umbrosa, sp. n., Jordan, P. U. S. Nat. Mus. vii. p. 105, Key West.

Raja australis, sp. n., Macleay, P. Linn. Soc. N. S. W. viii. p. 461, Port Jackson.

Orolophus bucculentus, sp. n., id. op. cit. ix. p. 172, Port Jackson.

Fossil remains from the Oligocene of Palmnicken, referred either to *Rhinoptera* or *Zygobates*; Hasse, t. c. p. 5, pl. i. figs. 4 & 5.

3.

GANOIDEI.

*DOGIEL, A. Bau der Retina der Ganoiden [original title in Russian]. Arb. Naturf. Ges. Kasan, xi. lief. 6, 124 pp., 3 pls. [See Arch. mikr. Anat. xxii. pp. 419-472, pls. xvii.-xix., 1883.]

14 Pisces.

PISCES.

* PELZAM, E. Biologische Untersuchungen über störrartige Fische [original title in Russian]; SB. Naturf. Ges. Kasan, 1883, Beilage No. 65 (17 pp.).

Scaphaspis nathorsti, sp. n. (foss.), Lankester, Sv. Ak. Handl. xx. No. 9, p. 5, pl. i. figs. 1-3, Upper Silurian sandstone of Dickson Bay, Spitzbergen.

Cephalaspis sp. (foss.). Remains probably referable to *C. agassizi*, Lank., and *C. (Zenaspis) salweyi*, Egert.; *id. t. c.* p. 5, pls. i. fig. 4, & ii. fig. 5, from Upper Silurian sandstone, Dickson Bay, Spitzbergen.

Fish remains from the Upper Devonian or Lower Carboniferous (?) strata of Miner's Valley, Spitzbergen:—*Scales* of a *Glyptodipterine* fish, resembling *Strepsodus*, p. 5, pls. ii. figs. 7-9, & iii. figs. 10-12; *Bony fragments*, probably of a Rhizodont Fish, p. 6, pl. iv. figs. 16-17; *Teeth*, p. 6, pl. iv. figs. 13-15 & 18: *id. t. c.*

Ceratodus fosteri. Notes on remains from the Post-Pliocene, referred to this species; De Vis, P. R. Soc. Queensl. i. pt. i. pp. 40-43.

Calacanthus tingleyensis, sp. n. (foss.), Davis, Tr. L. Soc. ii. pt. 13, pp. 427-433, pls. xlii.-xlix., Yorkshire cannel coal.

Lissolepis, g. n. (foss.), for *L. serratus*, sp. n., *id.* Ann. N. H. (5) xiii. p. 449, pl. xvi., Lias of Lyme Regis.

Crassopholis, g. n. (foss.), p. 1152, for *C. magnicaudatus*, p. 1153, *Comp. Am. Nat.* xvii., Eocene of Green River.

Megalichthys, Agassiz (foss.), remarks; *M. laticeps*, sp. n.: Traquair, *Geol. Mag.* (3), i. pp. 115-121, pl. v, and P. Phys. Soc. Edinb. viii. pp. 67-77, pl. iv., Calciferous sandstone, Burdiehouse. *M. hiberni* (foss.), Miall, J. G. Soc. xl. p. 347, figs. 1-6, and Davis, *op. cit.* pl. xxvi. fig. 8.

Dendrodus, Pander. Notes on and figure by Trautschold, *Bull. Mosc.* 1883, pt. 3, p. 162, woodcut.

Calodus sp. (foss.) described and figured by Bassani, JB. *Geol. Reichsanst.* xxxiv. p. 405, pl. ix. fig. 3, Chalk of Monte S. Agata, Goritz.

Ptycholepis gracilis, sp. n. (foss.), Davis, Ann. N. H. (5) xiii. p. 335, pl. x., Lias of Lyme Regis.

Dinichthys minor, sp. n. (foss.), Ringueberg, *Am. J. Sci.* (3) xxvii. p. 476, Portage Group of Western New York.

Elonichthys ortholepis, sp. n. (foss.), Traquair, *t. c.* p. 8, Lower Carboniferous rocks of Eskdale, Dumfriesshire.

INCERTÆ SEDIS.

Lophostracon spitzbergense, g. & sp. nn. (foss.), Lankester, *t. c.* p. fig. 6, Upper Silurian sandstone, Dickson Bay, Spitzbergen.

TELEOSTEI.

BROOK, G. On the Development of the Lesser Weever-Fish (*Trachinus vipera*). J. L. S. xviii. pp. 274-291, 4 pls.

FRITSCH, G. Ueber den Angelapparat des *Lophius piscatorius*. SB. Ak. Berlin, 1884, pp. 1145-1151, with woodcut.

GILL, T. On the Mutual Relations of the Hemibranchiate Fish. P. Ac. Philad. 1884, pp. 154-166.

Of the six families, *Gastrosteidae*, *Aulorhynchidae*, *Aulostomidae*, *Fistulariidae*, *Macrorhamphosidae*, *Amphisilidae*, recognized by the author as comprising the Order *Hemibranchii*, a synopsis and synonymy is given, and a diagnosis of the groups contained therein. In addition to the above, two families are created for extinct forms, *Urosplen fistularis* and *Rhamphosus aculeatus*, Agass. The family *Pegasidae* is also included, on the authority of Cope.

—. Three new Families of Fishes added to the Deep-Sea Fauna in a year. Am. Nat. xviii. p. 433.

The following are the names of the types, of which some preliminary notes are given:—*Derichthys serpentinus* (*Derichthyidae*), *Stephanoberyx mona* and *Acanthochanuss luetkenii* (*Stephanoberycidae*), *Aleposomus copei* (*Alepocephalidae*).

GORONOWITSCH, N. Studien über die Entwicklung des Medullarstranges bei Knochenfischen, nebst Beobachtungen über die erste Anlage der Keimblätter und der Chorda bei Salmoniden. Morph. JB. x. pp. 376-440, pls. xviii.-xxi.

—. Vorläufige Mittheilung über die Entwicklung des Centralnervensystems bei Knochenfischen. Zool. Anz. vii. pp. 270-272.

HILGENDORF, —. Ueber die Fischgattung *Amphisile*. SB. nat. Fr. 1884, pp. 52-55.

KLEIN, A. v. Beiträge zur Bildung des Schädels der Knochenfische. JH. Ver. Württ. xl. pp. 129-251, pls. ii. & iii.

KUPFER, C. [Vide *suprà*, p. 2.]

RABL-RÜCKHARD, H. Das Gehirn der Knochenfische. Biol. Centralbl. iv. pp. 499-510 & 528-541, with woodcuts.

ROHON, V. Zur Histiogenese des Rückenmarkes der Forelle. SB. bayer. Ak. 1884, pp. 39-56, pl. ii. [Extract in J. R. Micr. Soc. (2) iv. p. 546.]

SAGEMEHL, M. Beiträge zur vergleichenden Anatomie der Fische, II. Einige Bemerkungen über die Gehirnhäute der Knochenfische; pp. 457-474, pl. xxiii. III. Das Cranium der Characiniden nebst Fossileinen Bemerkungen über die mit einem Weber'schen Apparat *thinoptenen* Physostomenfamilien; x. pp. 1-117, pls. i. & ii. Morph.

—. Ueber die Pharyngealtaschen der Scarinen und das Wiederkäuen dieser Fische. Op. cit. x. pp. 193-203, with woodcut.

SÈDE DE LIÈUX, P. DE. Recherches sur la ligne latérale des Poissons osseux. Paris: 1884, 8vo, 115 pp., 4 pls. (Extract in Rev. Sci. xxxiv. pp. 467-470.)

SORENSEN, W. Om Lydorganer hos Fiske. En physiologisk og comparativ-anatomisk Undersøgelse. Kjobenhavn: 1884, 8vo, pp. iii. 245, 1, pls. i.-iv.

In this paper, the author describes and figures various anatomical structures in Fishes, such as the structure of the dorsal and pectoral fins in various genera of *Siluridæ*, *Monacanthus*, *Acanthurus*, *Triacanthus*, and *Centrus*, the dorsal and ventral spines of *Capros* and *Gastrosteus*, and the swim bladder in many other fishes, &c. and explains how, by various movements of the muscles which work these parts, they are enabled to produce sounds.

TROIS, E. F. Osservazioni sull' intima Struttura delle Branchie del *Xiphias gladius*. Atti Ist. Venet. (6) i. pp. 773-783, pl. iii.

— Ricerche sulla Struttura della *Ranzania truncata*. Op. cit. ii. pp. 1543-1559, pl. xvi.

ACANTHOPTERYGII.

PERCIDÆ.

Perca fluviatilis, L., redescribed and figured; Sundman, Finlands Fisk. pt. iii. p. 5, pl. ix.

Elassoma evergladesi, sp. n., Jordan, P. U. S. Nat. Mus. vii. p. 323, Florida.

Lucioperca lucioperca, L., pt. i. p. 9, pl. iii., and *rutilis*, L., pt. iv. p. 3, pl. xi., redescribed and figured; Sundman, t. c.

Serraria, g. n. Differing from *Hadropterus* in the wide union of the branchiostegal membranes across the isthmus and the well-developed serration of the preopercle. For *H. scierus*, Swains. Gilbert, P. U. S. Nat. Mus. vii. p. 205.

Pacilichthys borealis, p. 477, Canada, *quiescens*, p. 478, Georgia, *swaini*, p. 479, Mississippi, and *beani*, p. 479, Missouri, spp. nn., Jordan, t. c.; *P. palustris*, sp. n., Gilbert, t. c. p. 209, Switz City Swamp, Indiana.

Anthias squamipinnis, Pet., fig. 1, *gibbosus* and *teniatus*, fig. 2, spp. nn.; Klunzinger, F. d. Rothen M. p. 9, pl. iii., Red Sea.

JORDAN, D. S., & SWAIN, J. A Review of the American Species of *Epinephelus* and related genera. P. U. S. Nat. Mus. vii. pp. 358-410.

Contains a synopsis and synonymy of the genera and species (33) of *Epinephelus* known from American waters, with full descriptions of most of the species examined. The authors divide *Epinephelus* into 6 genera (or subgenera): *Mycteroperca*, *Alphestes*, *Promicrops*, *Dermatichthys*, *Epinephelus*, and *Enneacentrus*. A list of nominal species with identifications is added, and a tabular list of the 35 species with an indication of the nature of questions of doubt remaining to be solved in each case. The following varieties are described as new:—

Mycteroperca fulcata, Poey, var. n. *phenax*, p. 363, and *M. bonaci*, Poey, var. n. *xanthosticta*, p. 371, Florida.

Hyposerranus, subg. n., for *Serranus morrhua*, C. & V., *areolatus*, Forsk., and *geoffroyi*, nom. n., = *S. taurina*, Geoff., = *areolatus*, C. & V., Günth.,

&c. (*nec* Forsk.), p. 3, *S. morrhua*, C. & V., fig. 2, *areolatus*, Forsk., fig. 1, and *taurina*, Forsk., fig. 3, pl. i., *sumana*, Forsk., figs. 1 & 2, and *marmoratus*, nonn. 2., = *leucostigma*, Klz. (*nec* Ehrb.), p. 5, fig. 3, pl. ii.; Klunzinger, t. c. *S. cabrilla*, L.*; Ewart, Rep. Scot. Fisheries, ii, App. F, No. vii. p. 79, pl. xii. *Pseudoserranus cabrilla*, Klunzinger, t. c. pl. ii. figs. 4 & 5. *S. perguttatus*, p. 445, New Hebrides, and *cruentus*, p. 446, New Britain, viii., *subfasciatus*, p. 389, and *mars*, p. 390, Cardwell, *mysticalis*, p. 390, Queensland, ix., De Vis, P. Linn. Soc. N. S. W., spp. nn.

Epinephelus nigrilis (Holb.). On its occurrence off Block Island; Smiley, Bull. U. S. Fish Comm. iv. p. 240.

Roccus striatus, Mitch. Note on the occurrence of this fish in the Lower Mississippi Valley, with description and comparative table of measurements; Bean, P. U. S. Nat. Mus. vii. p. 242.

Trisotropis bonaci, Poey (= *P. aguaji*, Poey). A specimen referred to this species described and a table of measurements given; Bean & Dresel, P. U. S. Nat. Mus. vii. p. 164.

Rhypticus saponaceus, Bl., = *Eleutheractis coriaceus*, Cope; Jordan, P. U. S. Nat. Mus. vii. p. 35.

GILL, T. The Osteological Characteristics of the *Lutjaninae*. P. U. S. Nat. Mus. vii. pp. 351-355.

In this subfamily, the author recharacterizes the 7 genera adopted by Poey in 1871, and gives a diagnosis of the skeletal features by which they may be recognized.

JORDAN, D. S., & SWAIN, J. A Review of the Species of *Lutjanine* and *Hoplopagrina* found in American Waters. P. U. S. Nat. Mus. vii. pp. 427-474.

The authors accept the views of Gill as to the relationship of these forms, and place them in the family *Sparidae*. They consider the cranial character of the separation of the interorbital area from the occipital region more important than the squamation of the soft dorsal or the separation of the spinous dorsal characters by which Bleeker has arranged the groups noticed in this paper in three genera (*Lutjanus*, *Aprion*, and *Etelis*), and divide the (27) American species into 8 genera (*Hoplopagrus*, *Lutjanus*, *Ocyurus*, *Rhomboplites*, *Tropidinius*, *Aprion*, *Etelis*, and *Verilus*), of which a synonymy is given, and a synopsis by which the genera and species may be distinguished. Full descriptions are given only of those species which have been examined. A list of the nominal species, with their identifications, is added, and a table of the 27 species admitted, giving their distribution and the nature of the questions of doubt still remaining to be solved in each case.

versatus caballerote, Bl., = *L. stearnsii*, G. & B., = *caxis* (young), J. & G. and *L. campechianus*, Poey, = *blackfordi*, G. & B.; Jordan, t. c. p. 35. *L. caballerote* cannot be identified with *stearnsii*; Goode & Bean, t. c. p. 42; also Jordan, t. c. p. 193. *L. blackfordi*, G. & B., = *L. campechianus*, J. & G. (*nec* *Mesoprion compeachianus*, Poey; see Jordan, p. 35); Goode & Bean, P. U. S. Nat. Mus. vii. p. 42.

* Wrong identification. — ED.

Rhomboplites aurorubens, C. & V., = *Mesoprion elegans*, Poey, = *Aprion ariomnus*, J. & G.; Jordan, *t. c.* p. 36.

Genyorogete nigricauda, sp. n., De Vis, P. Linn. Soc. N. S. W. ix. p. 391, Queensland.

Mesoprion ehrenbergi, Pet.; Klunzinger, F. d. Rothen M. pl. ii. fig. 6. *M. flavirosea*, sp. n., De Vis, *op. cit.* viii. p. 446, New Britain.

Homodemus, g. n. Six branchiostegals, one dorsal with eleven spines, anal with three. No canines. Teeth on vomer, palatines, and jaws. Outer row of jaw teeth larger, all villiform. No teeth on the tongue. Operculum with an obtuse point, entire. Præoperculum entire. Scales small. Lower jaw the longer. For *H. cavifrons*, sp. n., *id. op. cit.* ix. p. 396, Tully River.

Dules humilis, sp. n., *id. ibid.*, Queensland.

Helotes profundior, sp. n., *id. t. c.* p. 397, S. Australia.

Therapon spinosior, p. 397, and *acutirostris*, p. 398, spp. nn., *id. t. c.*, Queensland.

Autisthes, g. n. Persistent vomerine teeth; body oblong; jaws subequal; one dorsal deeply notched, with 12 strong spines. In each jaw an outer series of stout conical teeth. All the bones of the head armed, operculum with a strong spine. Scales small, three strong anal spines, eye large, no groove behind the chin nor pores on the mandibles. For *A. argenteus*, sp. n., *id. t. c.* p. 398, Queensland.

Pomadasys chrysoptera, L., must supersede *P. fulvomaculatus*; Jordan, P. U. S. Nat. Mus. vii. p. 191. *P. approximans*, sp. n., Bean & Dresel, P. U. S. Nat. Mus. vii. p. 160, Jamaica.

JORDAN, D. S., & SWAIN, J. A Review of the Species of the Genus *Hæmulon*. P. U. S. Nat. Mus. vii. pp. 281-317.

The 20 species of this genus recognized as probably valid are divided into 5 groups or subgenera: *Hæmulon* (13 species), *Brachygenys* (2), *Bathystoma* (3), *Lythrulon* (1), and *Orthostæchus* (1). An elaborate synopsis and synonymy are given, and such species as have been collected by Professors Jordan & Gilbert are redescribed. A list is given of nominal species of *Hæmulon*, arranged in chronological order, with identifications.

Hæmulon (Bathystoma) rimator, nom. n., = *H. chrysopteron*, C. & V., &c., p. 308; see also Bean & Dresel, p. 158. *H. gibbosum*, Bl., must be used instead of *H. album*, C. & V. (= *chromis*, C. & V., = *microphthalmum*, Gthr.); Jordan, *t. c.* p. 190; see also Jordan & Swain, p. 290. *H. fremebundum*, G. & B.; note and table of measurements; Bean & Dresel, *t. c.* p. 159.

Hephaestus, g. n. Form of body rather elevated; eye rather small, mouth horizontal, the lower jaw rather the shorter. One dorsal spine, anal with 3; caudal fin emarginate. No canine, pr vomerine teeth. Præoperculum denticulated, operculum with points. Scales moderate, ctenoid; 6 branchiostegals; pseudobranchia and air-bladder (?). For *H. tulliensis*, sp. n., De Vis, *t. c.* p. 399, Queensland rivers.

Diagramma sordidum, Klz., fig. 6, and *umbrinum*, Klz., fig. 9; Klunzinger, *t. c.* pl. iii.

Gerres. On the West African species; Horst, Notes Leyd. Mus. v. Note ix. pp. 27-30. *G. octactis*, Bleek. (= *nigri*, Günth.), distinguished from *melanopterus*, Bleek.; *G. oeyena*, Forsk., figs. 1 & 1a, and *argyreus*, Forst., fig. 1b, pls. v. & xiii. fig. 3: Klunzinger, *t. c.* *G. splendens*, sp. n., De Vis, *t. c.* p. 400, Cardwell.

Scolopsis plebeius, sp. n., *id. ibid.*, Queensland. *S. inermis*, Schleg.; Klunzinger; *t. c.* pl. vii. fig. 3.

Dentex nufar, Ehrb., fig. 2, and *D. (Polysteganus) cæruleopunctatus*, Klz., fig. 1, Klunzinger, *t. c.* pl. iv.

Cæcio suevicus, sp. n., *id. t. c.* p. 46, pl. v. fig. 2.

Ambassis klunzingeri, Steind., fig. 3, and *denticulata*, Klz., fig. 4; *id. t. c.* pl. iii.

Pseudambassis nigripinnis, p. 393, Brisbane, *pallidus*, p. 393, and *convexus*, p. 394, Queensland, spp. nn., De Vis, *t. c.*

Apogon bifasciatus, Rüpp.; Klunzinger, *t. c.* pl. iii. fig. 5, juv. *A. simplex*, p. 394, Cooktown, and *rudis*, p. 395, Cardwell, spp. nn., De Vis, *t. c.* *A. conspersus*, Klunz., redescribed and figured; Steindachner, SB. Ak. Wien, lxxxviii. p. 1066, pl. i. fig. 1.

Gulliveria ramsayi, sp. n., Macleay, P. Linn. Soc. N. S. W. ix. p. 11, Port Darwin.

Apogonichthys longicauda, sp. n., De Vis, *t. c.* p. 395, Queensland; *A. utulatus*, All. & Macl., p. 1065; *A. auritus*, C. & V., = *marmoratus*, All. & Macl., = *polystigma*, Blkr., p. 1066: notes by Steindachner, *t. c.*

Priacanthus junonis, sp. n., De Vis, *t. c.* p. 392, Queensland.

Herops, g. n. Teeth on the vomer and palatine bones; in jaws villiform, without canines; eye very large; operculum spiniferous; præoperculum serrated without spines; one dorsal deeply notched; dorsal and anal sheathed; lateral line continuous; gape very oblique; habit elevated, compressed; branchiostegals six; upper surface of head naked. For *H. munda*, sp. n., *id. t. c.* p. 392, Cardwell.

Neoniphon hasta, sp. n., *id. t. c.* p. 537, Queensland.

Micropterus dolomieu and *nigricans*. Note by Dury, J. Cincinn. Soc. vii. p. 140.

SQUAMIPINNES.

Chatodon aurora and *nigripes*, p. 453, *germanus* and *townleyi*, p. 454, spp. nn., De Vis. P. Linn. Soc. N. S. W. ix., Queensland. *C. semilarvatus*, C. & V.; Klunzinger, F. d. Rothen M. pl. xi. fig. 1.

Heniochus macrolepidotus, L.; *id. t. c.* pl. viii. fig. 3, juv.

Holacanthus asfur, Forsk., fig. 2, and *maculosus*, Forsk., fig. 1; *id. t. c.*

H. sphyinx, sp. n., De Vis, *t. c.* p. 457, Queensland.

Verapophagus quadratus, p. 455, and *etate-variatus*, p. 456, spp. nn., *id.* Queensland.

MULLIDÆ.

Upeneoides rubriniger, sp. n., *id. t. c.* p. 458, no locality.

Parupeneus notospilus, nom. n., = *Upeneus spilurus*, Klz. (*nec* Bleek.); Klunzinger, F. d. Rothen M. p. 50, pl. v. fig. 3.

Mulloides erythrinus, nom. n., = *ruber*, Klz., Gthr. (*nec* Lacép.), = *barbatus*, L.; *id. t. c.* p. 50. *M. armatus*, sp. n., De Vis, *t. c.* p. 458, Queensland.

SPARIDÆ.

Lethrinus ornatus, sp. n., *id. t. c.* p. 458, Wide Bay. *L. nebulosus*, Forsk., fig. 1, *mahsenoides*, Ehrb., fig. 2, and *xanthochilus*, Klz., fig. 3, pl. vi.; *acutus*, nom. n., = *ramak*, Klz., etc. (*nec* Forsk.); and *miniatus*, Forst., fig. 2, pl. vii.: Klunzinger, *t. c.*

Sparus pagrus, L. (= *Pagrus argenteus*, G. & B.). Notes on the identity of European and American species, by Goode & Bean, P. U. S. Nat. Mus. vii. p. 46. *S. (Pagrus) megalommatus*, Klz., pl. iv. fig. 3, and *S. (Chrysophrys) berda*, Forsk., pl. xiii. fig. 1; Klunzinger, *t. c.*

JORDAN, D. S., & GILBERT, C. H. A Review of the Species of the Genus *Calamus*. P. U. S. Nat. Mus. vii. pp. 14-24.

Contains descriptions of the species *C. pennatula*, *calamus*, *bajonado*, *milneri*, and *arctifrons*, with notes and synonymy of these and the other species. Notes are also given regarding the mode of nomenclature used by various authors.

Calamus proridens, sp. n., = *C. pennatula*, J. & G. (*nec* Guichenot); *id. t. c.* pp. 15 & 150, Key West (see *id. t. c.* p. 15).

Pimblepterus fallax, nom. n., = *indicus*, Klz. (*nec* C. & V.); Klunzinger, *t. c.* p. 64.

HOPLOGNATHIDÆ.

Hoplognathus conwayii, ? Richards, described from Tasmania; Johnston, P. R. Soc. Tasm. 1884, p. 194.

CIRRHITIDÆ.

Chilodactylus fuscus, Casteln., p. 1076, and *C. nebulosus*, Klunz., p. 1078, pl. ii. fig. 1, described, and the latter figured; Steindachner, SB. Ak. Wien, lxxxviii.

Psilocranium, g. n. Most nearly allied to *Chilodactylus*, from which it is distinguished by its elongate, almost cylindrical, form of body, and naked head. For *P. coxii*, sp. n., Macleay, P. Linn. Soc. N. S. W. viii. p. 440, pl. xxii., Port Jackson.

SCORPENIDÆ.

Pterois volitans, L.; Klunzinger, F. d. Rothen. M. pl. v. fig. 5. & G.

Centropogon nitens, sp. n., De Vis, P. Linn. Soc. N. S. W. ix. p. 459, Queensland.

Tetraroge vestitus, viii. p. 466, South Seas, and *T. bellona* and *hamiltoni*, ix. p. 460, Queensland, spp. nn., *id. op. cit.*

Aploactis lichen, sp. n., *id. op. cit.* ix. p. 461, Queensland.

Pelor barbatus, sp. n., *id. t. c.* p. 547, Queensland.

NANDIDÆ.

Plesiochelys, Steind., described; Steindachner, SB. Ak. Wien, lxxxviii. p. 1089.

TEUTHIDIDÆ.

GILL, T. Synopsis of the Genera of the super-family *Teuthidoidea* (families *Teuthididae* and *Siganidae*). P. U. S. Nat. Mus. vii. pp. 275-281.

Certain changes in nomenclature, and two new generic names (*Ctenochaetus* and *Colocopus*) are proposed for sections of the genus *Acanthurus*.

MEEK, S. E., & HOFFMANN, M. L. A Review of the American Species of the Genus *Teuthis*. P. Ac. Philad. 1884, pp. 227-231.

3 species are recognized as valid; of these, notes and the synonymy are given, with an analysis of their most important specific characters.

Teuthis gibbosus, p. 461, *teuthopsis* and *flava*, p. 462, spp. nn., De Vis, P. Linn. Soc. N. S. W. ix., Queensland.

BERYCIDÆ.

Beryx borealis, Düb. & Kor., distinguished from *B. decadactylus*, C. & V.; Collett, Forh. Selsk. Chr. 1884, No. 1, pp. 1-7, pl. i.

Myripristis murdjan, Forsk.; Klunzinger, t. c. pl. iii. fig. 8, juv.

Holocentrum sammara, Forsk.; *id. t. c.* pl. iii. fig. 7, juv.

Rhynchichthys novæ-britanniæ, sp. n., De Vis, *op. cit.* viii. p. 447, New Britain.

Harpage, g. n. With two dorsals; jaws equal, villiform teeth on the jaws, vomer, palatines, and tongue; five branchiostegals; præoperculum scarcely spiniferous; caudal forked; anal with three spines, etc. Appears to be most nearly allied to *Myripristis*. For *H. rosea*, sp. n., *id. t. c.* p. 448.

KURTIDÆ.

Parapriacanthus, Steind., = *Pempherichthys*, Klz.; *Parapriacanthus guentheri*, Klz.: Klunzinger, t. c. p. 81, pl. v. fig. 4.

POLYNEMIDÆ.

Polynemus sheridani, sp. n., Macleay, P. Linn. Soc. N. S. W. ix. p. 21, Queensland.

SCIÆNIDÆ.

Micropogon furnieri, Desm. Notes by Jordan, P. U. S. Nat. Mus. vii. p. 36.

Sciæna sciera, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. vii. p. 180, Mazatlan and Panama.

Bairdiella armata, Gill, distinguished from *B. argyroleuca*, and a comparative table of measurements given; Bean & Dresel, P. U. S. Nat. Mus. vii. p. 156.

Corvina canina, *comes*, and *axillaris*, spp. nn., De Vis, P. Linn. Soc. N. S. W. ix. p. 538, Brisbane River.

XIPHIIDÆ.

Xiphias gladius, L. On the anatomy of the eye; Vincenzo, Rend. Acc. Bologn. 1883, pp. 107-109, 1 pl. On the structure of the branchiæ; Trois, Atti Ist. Venet. (6) i. pp. 773-783.

TRICHIURIDÆ.

Trichiurus auriga, pl. xii. fig. 1, and *cristatus*, pl. xiii. fig. 5, spp. nn., Klunzinger, t. c. p. 121, Red Sea.

ACRONURIDÆ.

Acanthurus zebra, sp. n., De Vis, *op. cit.* viii. p. 447, Duke of York's Group.

Naseus strigatus, sp. n., *id. op. cit.* ix. p. 539, Queensland. *N. vomer* Klz.; Klunzinger, F. d. Rothen M. pl. xiii. fig. 2.

CARANGIDÆ.

Caranx africanus, Steind., described and figured; Steindachner, SB. Ak. Wien, lxxxviii. p. 1108, pl. vii. fig. 1. *C. ruber*, Bl., and *bartholomæi*, C. & V.: notes on these species; Jordan & Gilbert, P. U. S. Nat. Mus. vii. pp. 32 & 33. *C. auriga*, p. 539, *cives* and *procaranx*, p. 540, and *eclipsifer*, p. 541, spp. nn., De Vis, t. c., Queensland. *C. (Carangoides) flavoguttatus*, Forsk., pl. xii. fig. 4, and *impudicus*, nom. n., = *talamparoides*, Klz. (*nec* Bleek.); Klunzinger, t. c. p. 99.

Decapterus jacobæus, C. & V.; Klunzinger, t. c. pl. xii. fig. 2.

Micropteryx queenslandiæ, sp. n., De Vis, t. c. p. 541, Queensland.

Seriola. A key to the species of the United States; Jordan, P. U. S. Nat. Mus. vii. p. 123.

MEEK, S. E., & GOSS, D. K. A Review of the American Species of the Genus *Trachynotus*. P. Ac. Philad. 1884, pp. 121-129.

8 species are admitted. The eighth, *T. marginatus*, C. & V., is included, the description being too brief. The 5 species occurring on Atlantic Coast are redescribed from specimens obtained at H. Lutjan & Co. Key West.

Trachynotus coppingeri, sp. n., Günther, Rep. Zool. Alert, p. 29, pl. iii. A, Percy Island.

Equula dispar, *longispina*, and *argentea*, p. 542, *decora* and *ovalis*, p. 543, *simplex*, *asina*, and *profunda*, p. 544, spp. nn., De Vis, t. c., Queensland.

STROMATEIDÆ.

FORDICUS ~~W.~~ W. A Review of the American Species of *Stromateidæ*.
P. Ac. Philad. 1884, pp. 311-317.

A synopsis of the genera and species *Stromateus* and *Leirus*, with notes and synonymy.

GILL, T. Notes on the *Stromateidæ*. P. Am. Phil. Soc. xxi. pp. 664-672.

A synopsis and synonymy, &c., is given of the groups.

NOMEIDÆ.

Cubiceps brevimanus, sp. n., Klunzinger, t. c. p. 116, pl. xii. fig. 3.

SCOMBRIDÆ.

MEEK, S. E., & NEWLAND, R. G. A Review of the American Species of *Scomberomorus*. P. Ac. Philad. 1884, pp. 232-239.

4 species are recognized as valid.

Cybium tigris, sp. n., De Vis, P. Linn. Soc. N. S. W. ix. p. 545, Queensland.

Echeneis remora. Notes on the life-colours of this fish; Vaillant, Bull. Soc. Philom. (7) viii. pp. 5-7. On the employment of this fish by native fishermen on the East Coast of Africa; Holmwood, P. Z. S. 1884, pp. 411-413, woodcut.

TRACHINIDÆ.

GRESSIN, L. Contribution à l'étude de l'appareil à venin chez les poissons du genre "Vive" (*Trachinus draco*, *T. vipera*, *T. radiatus*, *T. araneus*). Paris: 1884, 8vo, 51 pp., 1 pl.

Trachinus vipera. On development, see Brook, J. L. S. xviii. pp. 274-291.

Percis stricticeps, p. 545, and *concinna*, p. 546, spp. nn., De Vis, t. c., Queensland; *P. huackei*, sp. n., Steindachner, SB. Ak. Wien, lxxxviii. p. 1070, Gulf of St. Vincent and S. Australia.

Parapercis, g. n. (vel subg. ?). Differs from *Percis* only in having teeth on the palate. For *P. ramsayi*, Steind. *Id. t. c.* p. 1072.

Taumatilatus microps. Goode & Bean give notes pointing out the differences between this species and *C. chrysops* and *C. cyanops*; P. U. S. Polus. vii. p. 44.

BATRACHIDÆ.

Batrachus cirrhosus, Klz.; Klunzinger, F. d. Rothen M. pl. xiii. fig. 4.

Thalassophryne cæca, sp. n., De Vis, t. c. p. 546, Queensland.

Porichthys porosissimus, C. & V., = *P. plectodon*, J. & G. Note by Jordan, P. U. S. Nat. Mus. vii. p. 41.

PEDICULATI.

Antennarius ocellatus, Bl. & Schn. Note by Jordan, P. Ac. Philad. 1884, p. 45.

COTTIDÆ.

Platycephalus haackei, Stein., described and figured; Steindachner, t. c. p. 1081. *P. longispinis*, sp. n., Macleay, P. Linn. Soc. N. S. W. ix. p. 170, Port Jackson.

Lepidotrigla mulhalli, sp. n., *id. op. cit.* viii. p. 460, Port Jackson.

Prionistius, g. n. Resembling *Triglops*; from which it differs (1) in its much slenderer form; (2) the absence of a series of bony tubercles along the bases of the dorsal fins; (3) the elongation of the exerted pectoral rays, so that the lower portion of the fin is considerably longer than the upper; (4) the presence of serrations on all dorsal species and on the first soft ray; and (5) the emargination of the caudal fin. For *P. macellus*, sp. n., Bean, P. U. S. Nat. Mus. vi. p. 355, Carter Bay, Brit. Col.

PEGASIDÆ.

Notes on this family; Gill, P. Ac. Philad. 1884, p. 166.

DISCOBOLI.

Liparis barbatus. On the myology of the ventral sucker; Stuckens, Bull. Ac. Belg. (3) viii. pp. 74-84, 1 pl.

GOBIIDÆ.

Gobius wuerdemanni, Girard, redescribed by Jordan, P. U. S. Nat. Mus. vii. p. 321. *G. haackei*, Steind., described; Steindachner, t. c. p. 1074. *G. colonianus*, Risso (= *lichtensteinii*, Steind.), described and figured; Steindachner & Kolombatovic, SB. Ak. Wien, lxxxviii. p. 1199, pl. ii. figs. 1 & 1b. *G. congoensis*, sp. n., Sauvage, Bull. Soc. Z. Fr. ix. p. 205, woodcut, Congo. *G. princeps* and *watkinsoni*, p. 685, *stigmaticus* and *marginalis*, p. 686, *pauper* and *festivus*, p. 687, *annulatus*, p. 688, *concolor* and *flavescens*, p. 689, spp. nn., De Vis, P. Linn. Soc. N. S. W. ix., Queensland.

Lebetus orca, Coll. Notes and figure by Collett, N. Mag. Naturv. xvii. p. 61, pl. i. figs. 1 & 2.

Lepidogobius gulosus, Girard. Note by Jordan, t. c. p. 324.

Gobiosoma ceuthæcum, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. & G. Lujan, p. 29, Key West, Florida; *G. histrio*, sp. n., Jordan, t. c. p. 260, Guaymas, Mexico.

Gobiodon axillaris, p. 448, *G. flavidus*, *lineatus*, and *inornatus*, p. 449, Bank's Group, and *punctularum*, p. 449, South Sea Islands probably, De Vis, *op. cit.* viii., spp. nn.

Sicydium and *Lentipes*. A revision of these genera, in which the species

of *Sicydium* are divided into groups characterized by differences found in the teeth of the upper jaw ; 24 species are described as valid, of which 5 are new. - *Gt. Ent.*, P. Z. S. 1884, pp. 153-172, pls. xi. & xii.

Sicydium plumieri, Bl., p. 156, pls. xi. fig. 1, & xii. fig. 5, *acutipinne*, Guich., p. 159, and *stimpsoni*, Gill, p. 166, pl. xii. fig. 4, *id. t. c.* *S. antillarum*, p. 157, pl. xii. fig. 3, Barbadoes, *brevifile*, p. 158, pl. xii. fig. 1, Cameroons, *gymnogaster*, p. 158, pls. xi. fig. 2, & xii. fig. 6, Mazatlan, *salvini*, p. 159, pl. xii. fig. 2, Panama, *pugnans*, p. 160, pls. xi. fig. 3, & xii. fig. 7, Samoa, spp. nn., *id. t. c.*

Lentipes concolor, Gill, fig. 9, and *seminudus*, Gthr., fig. 10, described and teeth figured ; *id. t. c.* p. 171, pl. xii.

Eleotris dumerili, nom. n. for *E. maculata*, Dum. (*nec* Bloch.) ; Sauvage, Bull. Soc. Z. Fr. ix. p. 205, Congo. *E. mimus* and *humilis*, p. 690, *longicauda*, p. 691, *concolor*, *robustus*, and *laticeps*, p. 692, and *cavifrons*, p. 693, spp. nn., De Vis, *op. cit.* ix., Queensland.

Aristeus perporosus, sp. n., *id. t. c.* p. 694, Maryborough.

Leme purpurascens, sp. n., *id. t. c.* p. 698, Queensland.

Amblyopus (*Gobioides*) *peruanus*, sp. n. (= *A. broussoneti*, Gthr., *nec* Lacép.), p. 42, pl. ii. fig. 2, and *broussoneti*, Lacép., pl. iii. fig. 2 ; Steindachner, Denk. Ak. Wien, xlii. (1880), Guayaquil. *A. niger*, sp. n. ?, De Vis, *t. c.* p. 698, Queensland.

BLENNIIDÆ.

Blennius rouxii, Cocco, p. 1193, pl. ii. fig. 4, *adriaticus*, Steind. (= *B. caneveæ*, Kolomb., *nec* Vinc.), p. 1194, pl. i. figs. 2 & 2a, *caneveæ*, Vinc. (*nec* Kolomb.), p. 1197, pl. i. figs. 1 & 1a, and *dalmatinus*, Stein., p. 1198, pl. ii. fig. 2 ; Steindachner & Kolombatovic, SB. Ak. Wien, lxxxviii. *B. lupulus*, Bonap., noted and figured ; Tristram, Palestine, p. 162, pl. xix. fig. 3.

Petroscirtes wilsoni, sp. n., Macleay, P. Linn. Soc. N. S. W. ix. p. 171, Port Jackson ; *P. lineatus*, sp. n., De Vis, *t. c.* p. 698, Murray Island, Torres Straits.

Salarias griseus, sp. n., *id. op. cit.* viii. p. 450, South Sea Islands. *S. decipiens*, p. 694, *pauper*, *sublineatus*, and *belemnites*, p. 695, *furvus* and *furcatus*, p. 696, *helenæ*, *viperideus*, and *calvus*, p. 697, spp. nn., *id. t. c.*, Queensland, except the last from Murray Island, Torres Straits.

Cremnobates. A synopsis of the species found at Key West : Jordan, P. U. S. Nat. Mus. vii. p. 42. *C. nox*, sp. n., *id.* & Gilbert, P. U. S. Nat. Mus. vii. p. 30, Key West, Florida.

Polypterygium nasus, Risso, figured ; Steindachner & Kolombatovic, *t. c.* fig. 3.

Penopus lampetiformis, Walb., described and figured from the East Coast of Scotland ; Day, P. Z. S. 1884, p. 445, pl. xli. (also in Rep. Scot. Fisheries, ii. App. F, No. vi. p. 78, pl. x.).

Peronedys, g. n. Body eel-like and strongly compressed, especially in the elongate caudal portion ; head laterally convex, flattened above ; ventrals jugular, reduced to a short ray ; pectorals none ; dorsal long, almost entirely composed of spines, and confluent with the caudal and anal ; anal composed of two spines and numerous simple flexible rays ;

head scaleless (body, at least in its posterior part, covered with small rudimentary scales); six branchiostegal rays; gill membranes united inferiorly, not attached to the isthmus; vomer and palatines toothless; three lateral lines on the body. For *P. anguillaris*, sp. n., Steindachner, Anz. Ak. Wien, 1883, p. 197, and SB. Ak. Wien, lxxxviii. p. 1083, Gulf of St. Vincent.

Pataecus vincenti, sp. n. (Anz. Ak. Wien, 1883, p. 195), p. 1085, fig. 2, Gulf of St. Vincent, and *P. maculatus*, Gthr., p. 1087, fig. 3, described and figured; Steindachner, t. c., pl. vii.

Gnathypops mystacinus, sp. n., Jordan, t. c. p. 37, Pensacola.

MASTACEMBELIDÆ.

Mastacemblus marcheii, Sauv., and *niger*, Sauv., described; Sauvage, Bull. Soc. Z. Fr. ix. p. 206.

SPHYRÆNIDÆ.

MBEK, S. E., & NEWLAND, R. G. A Review of the American Species of the Genus *Sphyræna*. P. Ac. Philad. 1884, pp. 67-75.

A synopsis and synonymy of the 7 known species, with detailed descriptions of 4 out of the 5 species belonging to the Atlantic Ocean.

Sphyræna jello, C. & V., fig. 1, *kenie*, Klz., fig. 2, and *chrysotenia*, sp. n., p. 129, fig. 3, Klunzinger, F. d. Rothen M. pl. xi. *S. dubia*, Bleek., described; Guimarães, J. Sci. Lisb. xxxvii. p. 18.

ATHERINIDÆ.

Atherina pinguis, Lac., fig. 2, *forskali*, Rüpp., fig. 3, and *gobio*, nom. n., = *cylindrica*, Klz. (nec C. & V.), fig. 4; Klunzinger, F. d. Rothen M. pl. xi. *A. aræa*, sp. n., Jordan & Gilbert, P. U. S. Nat. vii. p. 27, Key West, Florida.

Atherinichthys eyresii, Steind., described; Steindachner, SB. Ak. Wien, lxxxviii. p. 1075.

Atherinosoma jamesoni, sp. n., Macleay, P. Linn. Soc. N. S. W. ix. p. 171, Bremer River.

MUGILIDÆ.

JORDAN, D. S., & SWAIN, J. A Review of the American Species of Marine *Mugilidæ*. P. U. S. Nat. Mus. vii. pp. 261-275.

A new subgenus, *Liza*, for Mugils with the adipose eyelid obsolete proposed. Type, *Mugil capito*, Cuv. Jordan & Swain, P. U. S. Nat. Mus. vii. p. 261.

Mugil hoeferi, Steind., described and figured [an *M. smithii*, Gthr., ?]; Steindachner, Denk. Ak. Wien. lxxv. p. 11, pl. iv. fig. 1. *M. crenilabis*, Forsk., fig. 2, *scheli*, Forsk., figs. 1 & 1a, *oeur*, Forsk., fig. 1b, *tade*, Forsk., fig. 3, and *lubiosus*, C. & V., fig. 4; Klunzinger, t. c. pl. x.

Querimana gyrans, sp. n., Jordan & Gilbert, t. c. p. 26, Key West, Florida.

GASTROSTEIDÆ.

A diagnosis of the groups; Gill, P. Ac. Philad. 1884, pp. 157-159.

FISTULARIIDÆ.

Gill gives diagnoses of *Aulorhynchidæ*, *Aulostomidæ*, *Fistulariidæ*, and *Macrorhamphosidæ*; t. c. pp. 159-164.

CENTRISCIDÆ.

Gill has notes on the *Amphisilidæ*; t. c. p. 164.
Amphisile fuschii, sp. n., Hilgendorf, SB. nat. Fr. 1884, p. 52, New Britain.

OPHIOCEPHALIDÆ.

Ophiocephalus insignis, sp. n., Sauvage, Bull. Soc. Z. Fr. ix. p. 195, pl. v. fig. 3, Ogooué.

LABYRINTHICI.

Trichopus cantor, Cant., described; id. t. c. p. 218.
Betta bellica, sp. n., id. t. c. p. 217, woodcut, Pérak.

TRACHYPTERIDÆ.

Trachypterus cristatus, Bonelli, described; Facciola, Nat. Sicil. iii. p. 163.
Regalecus argenteus, sp. n., Parker, Tr. N. Z. Inst. xvi. pp. 284-297, pls. xxiii. & xxiv., New Zealand.

ACANTHOPTERYGII PHARYNGOGNATHI.

POMACENTRIDÆ.

Amphiprion arion, sp. n., De Vis, P. Linn. Soc. N. S. W. viii. p. 451, South Seas.
Pomacentrus onyx, South Seas, *notatus*, New Britain, and *niomatus*, and *trifasciatus*, p. 452, probably South Sea Islands, spp. nn.,
Polka Queen *Modon pallidus*, Bank's Group, *amabilis*, South Sea Islands, id. t. c. p. 452. *G. assimilis* and *uniocellatus*, Q. & G.: on an intermediate form; id. t. c. p. 453.

LABRIDÆ.

Nesiotes, g. n. Anterior canines $\frac{4}{4}$, posterior 0; laterals confluent, with distinct serration; base of dorsal not scaly: twelve dorsal spines.

Differs from *Decodon* in the absence of a posterior canine, and from *Semicossyphus* in the serrations of the dental ridge. For *N. purpurascens*, sp. n., *id. t. c.* p. 453, South Seas.

Labrichthys (Austrolabrus) maculata, Maccl., described, and both sexes figured; Steindachner, SB. Ak. Wien, lxxxviii. p. 1100, pls. v. (♂) & vi. fig. 1 (♀).

Doratonotus thalassinus, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. vii. p. 28, Key West, Florida.

JORDAN, D. S., & SWAIN, J. Descriptions of Scaroid Fishes from Havana and Key West, including 5 new species. P. U. S. Nat. Mus. vii. pp. 81-102.

A contribution towards an exact knowledge of the American Scari. 14 species are described, and the life-colours given of each. A key is added. The following new species are described:—

Scarus virginialis, p. 88, Havana (= *S. vetula*, C. & V., = *Pseudoscarus psillacus*, Gthr., Cope, &c.).

Sparisoma lorito, p. 95, Havana, *cyanolene*, p. 98, and *xystrodon*, p. 99, Key West.

Cryptotomus beryllinus, p. 101, Havana.

Cymolutes sandeyeri, sp. n., Hector, Tr. N. Z. Inst. xvi. p. 323, Tiritiri Island, Auckland.

Xyrichtys psittacus, L. (= *Coryphæna lineata*, Gmelin): note by Goode & Bean, P. U. S. Nat. Mus. vii. p. 45. *X. rosipes*, sp. n., Jordan & Gilbert, *t. c.* p. 27, Key West, Florida.

Heteroscarus filamentosus, Casteln., p. 1092, pl. iii. fig. 1, *castelnaui*, Maccl., p. 1095, pl. iv., and *castelnaui*, Maccl., juv. or sp. n. (*H. elegans*), p. 1097, pl. iii. fig. 2, St. Vincent, described and figured; Steindachner, *t. c.*

Olistherops brownii, sp. n., Johnston, P. R. Soc. Tasm. 1884, p. 193, Tasmania.

CHROMIDES.

Chromis niloticus, Hasselq., var. *mossambicus*, Pets., described; Fischer, JB. Hamb. i. p. 27. *C. niloticus*, Hasselq., p. 164, pl. xviii. fig. 3, *andree*, Gthr., fig. 1, and *simonis*, Gthr., fig. 2, p. 165, pl. xvii., described and figured; Tristram, Palestine. *C. desfontainii* (Lac.): notes by Vinciguerra, Ann. Mus. Genov. xx. p. 429. *C. tholloni*, sp. n., Sauvage, Bull. Soc. Z. Fr. ix. p. 196, pl. v. fig. 1, Ogooué.

Melanogenes microcephalus, Bleek., described and figured; *id. t. c.* p. 196, woodcut.

Hemichromis sacra, Gthr., described and figured; Tristram, *t. c.* pl. xviii. fig. 2. *H. schwebischii*, sp. n., Sauvage, *t. c.* p. 198, pl. Ogooué.

ANACANTHINI.

GILL, T. On the Anacanthine Fishes. P. Ac. Philad. 1884, pp. 167-183.

In which the author questions the propriety of retaining this sub-order as a natural group from which he excludes the families *Gadopsidæ* and *Chiasmodontidæ* as being true *Acanthopterygii*.

GADOPSIDÆ.

Gadopsis f. *sp. n. ?*, Steindachner, SB. Ak. Wien, lxxxviii. p. 1105, pl. i. fig. 2.

LYCODIDÆ.

Lycodes esmarkii, Coll., p. 73, and *sarsii*, Coll., p. 78, pl. i. figs. 3 & 4. Notes by Collett, N. Mag. Naturv. xviii.

GADIDÆ.

Gadus aeglefinus, L. On the osteology and arthrology of this fish ; Brooks, P. R. Dubl. Soc. iv. (n.s.) pt. 4, pp. 166-196, pls. v.-ix.

Lotella maxillaris, sp. n., Bean, P. U. S. Nat. Mus. vii. p. 241, lat. 39° 55', long. 70° 28'.

Physiculus fulvus, sp. n., *id. t. c.* p. 240, lat. 40°, long. 69° 56'.

Lota lota, L., redescribed and figured ; Sundman, Finlands Fisk. pt. 4, p. 1, pl. x.

Hypsirhynchus, g. n. Pinnæ dorsi duo. Analis una. Caudalis septem. Ventrals pluribus radiis atque eminenti basi. Rictus adscendens.

Vomeris et palati lævia. Membrana branchiostega septem. Squamæ exiguæ. For *H. hepaticus*, sp. n., Facciola, Nat. Sicil. iii. p. 112, pl. ii.

MACRURIDÆ.

Macrurus globiceps (sp. n., Vaill., ined.) noted and figured by Filhol, La Nature, 1884, p. 185, fig. 2, and Nature, xxix. p. 484, fig. 1. *M. acrolepis*, sp. n., Bean, P. U. S. Nat. Mus. vi. p. 362, Port Townsend, Wash.

Krohnus filamentosus, Cocco. Extensive notes on this species ; Facciola, t. c. p. 291.

PLEURONECTIDÆ.

Rhombus maximus, Ewart, Rep. Scot. Fisheries, ii. App. F, No. vii. p. 80 pl. xiii.

Urophycis nebularis, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. vii. p. 237, Key West, Florida.

Urophycis lithostigma, nom. n. (for *P. dentatus*, J. & G., nec *Pleurophycis dentatus*, L., *fide* Bean), Jordan & Meek, P. U. S. Nat. Mus. vii. p. 237.

Solea (Achirus) haackeana, Steind., described and figured ; Steindachner, SB. Ak. Wien, lxxxviii. p. 1104, pl. i. fig. 3. *C. klunzingeri*, sp. n., *id.* Denk. Ak. Wien, xlii. (1880) p. 44, pl. ix. fig. 3, Guayaquil.

Achirus (Bæostoma) comifer, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. vii. p. 31, Key West, Florida.

neumayeri, p. 31, Ngurumán, spp. nn., Fischer, JB. Hamb. i. *B. tonkinensis*, sp. n., Sauvage, Bull. Soc. Z. Fr. ix. p. 211, pl. vii. fig. 3, Tonkin.

Leuciscus erythrophthalmus redescribed and figured; Sundman, Finland, Fisk. pt. i. p. 7, pl. ii.

Tinca tinca, L., redescribed and figured; *id. op. cit.* pt. iii. p. 3, pl. viii.

Squaliobarbus caudalis, sp. n., Sauvage, t. c. p. 211, pl. vii. fig. 2, Tonkin.

Hypargyrus (g. n., Forbes, MS.) *tuditanus*, Cope; Gilbert, P. U. S. Nat. Mus. vii. p. 200, described (= *Hybopsis tuditanus*, Cope).

Nocomis hyostomus, sp. n., *id. t. c.* p. 203, White River, Indiana.

Gymnognathus, g. n. This genus differs only from *Barilius* in the non-development of the suborbitals, leaving the greater part of the cheek uncovered, and the double row of pharyngeal teeth. For *G. harmandi*, sp. n., Sauvage, Bull. Soc. Z. Fr. ix. p. 214, pl. viii. fig. 2, Tonkin.

Hypophthalmichthys harmandi, sp. n., *id. t. c.* p. 212, pl. viii. fig. 1, Tonkin.

Abramis vimba, L., pt. i. p. 5, pl. i., *bjoerkna*, L., pt. ii. p. 15, pl. iv., and *brama*, L., pt. iii., p. 1, pl. vii., redescribed and figured; Sundman, *op. cit.*

Scardinopsis alburniformis, new name for hybrid between *Alburnus lucidus*, Heck., and *Scardinius* (*Leuciscus*) *erythrophthalmus*; L. Benck, Zool. Anz. vii. p. 228. The author does not seem to have been aware that this hybrid was named *Alburnus rosenhaueri* by A. J. Jäckel, Gart. Frankf. 1866, p. 20.

Alburnus orontis, Sauv. Notes and figure; Sauvage, N. Arch. Mus. (2) vii. p. 38, pl. i. fig. 3.

Culter balnei, fig. 4, and *recurvirostris*, fig. 3, spp. nn., *id.* Bull. Soc. Z. Fr. ix. p. 213, pl. viii., Tonkin.

Nemachilus galilæus, Gthr., fig. 2, and *insignis*, Heckel, fig. 1, noted and figured by Tristram, Palestine, p. 177, pl. xix.

CHARACINIDÆ.

Prochilodus rubroteniatus, Schomb. p. 16, and *longirostris*, Steind., p. 17, pl. vii. fig. 1; Steindachner, Denk. Ak. Wien, xlii. (1880).

Leporinus elongatus, Val., p. 18, and *vittatus*, Val., p. 19, redescribed; *id. t. c.*

Tetragonopterus caucanus, Steind., p. 20, pl. vi. fig. 2, *maculatus*, Steind., p. 21, and *rutilus*, Jenyns (= *scabripinnis*, which is the male), *id. t. c.*

Chirodon insignis, sp. n., *id. t. c.* p. 22, pl. vi. fig. 3, Cauca River.

Brycon labiatus, Steind., p. 23, pl. iii. fig. 1, *rubicauda*, Steind., p. 24, pl. viii., fig. 1, and *moorei*, Steind., p. 26, described, and two first figured; *id. t. c.*

Creagrutus affinis, sp. n.?, *id. t. c.* p. 27, R. Cauca.

Salminus affinis, sp. n., p. 28, pl. vii. fig. 2, R. Cauca, *S. curieri*, Val., p. 30, pl. ix. fig. 2, and *S. brevidens*, Cuv., p. 31; *id. t. c.*

Xiphorhamphus anomalus, sp. n., *id. t. c.* p. 32, R. Cauca.

CYPRINODONTIDÆ.

Cyprinodon ocellatus (Bonelli). Notes by Vinciguerra, Ann. Mus. Genov. xx, p. 44.

Fundulus seminolis, Girard; Jordan, P. U. S. Nat. Mus. vii. p. 322.
F. ocellaris, J. & G.: note on variation of colour, &c., in this species; *id. t. c.* p. 319.

Zygonectes chrysotus, Gthr. (= *Z. cingulatus*, J. & G. = ? *Fundulus cingulatus*, C. & V., nec *Hydrargyra lucia*, Baird): note; *id. t. c.* p. 319. *Z. zonifer*, sp. n., *id.* & Meek, P. U. S. Nat. Mus. vii p. 482, Georgia.

Rivulus elegans, sp. n.?, Steindachner, Denk. Ak. Wien, xlii. (1880) p. 33, pl. vi. fig. 6, R. Cauca.

Gambusia patruelis, B. & G. Ryder describes the development of this viviparous minnow; Science, iii. p. 769 [extr. in J. R. Micr. Soc. (2) iv. p. 712]. Note by Jordan, P. U. S. Nat. Mus. vii. p. 322.

Girardinus. Extensive notes on the anatomy, &c.; H. v. Ihering, Z. wiss. Zool. xxxviii. pp. 468-490. *G. caucanus*, sp. n., Steindachner, Denk. Ak. Wien, xlii. (1880) p. 35, pl. vi. fig. 4, R. Cauca.

Heterandria, Agass., supercedes *Girardinus*, Poey. Type, *H. formosa*, Agass., redescribed; Jordan & Meek, *t. c.* p. 236. *H. ommata*, sp. n., Jordan, *t. c.* p. 323, Florida.

Mollienesia latipinna, Le Sueur, = *M. lineolata*, Girard; *id. t. c.* p. 320.

Rhodeoides, g. n. Body compressed, elevated; rudiment of the lateral line on the first four scales of the body; lateral line replaced by a silver band; dorsal in advance of the anal, which has its origin under the middle of the former; caudal forked; lower jaw firmly united at the symphysis; teeth in both jaws in a single row recurved towards the interior of the mouth; mouth not protractile; no pharyngeal teeth. For *R. vaillanti*, sp. n., Thominot, Bull. Soc. Philom. (7) viii. p. 150, Magdalena Riv. (Bolivia).

SCOMBERESOCIDÆ.

Tylosurus euryops, sp. n., Bean & Dresel, P. U. S. Nat. Mus. vii. p. 168, Jamaica. *T. sagitta*, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. pii. p. 25, Key West, Florida.

and he, E., & Goss, D. K. A review of the American species of the These r. Hemirhamphus. P. Ac. Philad. 1884, pp. 221-226.

These r. Hemirhamphus. P. Ac. Philad. 1884, pp. 221-226. The authors recognize 5 species as valid. *Euleptorhamphus longirostris* not included, being regarded as the type of a genus distinct from Hemirhamphus. A table of comparative measurements is added.

Exocoetus volador, sp. n., Jordan, P. U. S. Nat. Mus. vii. p. 34, Pensacola. *E. longibarba*, sp. n., De Vis, P. Linn. Soc. N. S. W. viii. p. 454, New Britain.

ESOCIDÆ.

Esox lucius, L., redescribed and figured; Sundman, Finlands Fisk. pt. iv. p. 5, pl. xii.

MORMYRIDÆ.

Mormyrus (Isistius) henryi, Gill., described and figured; Sauvage, Bull. Soc. Z. Fr. ix. p. 207, pl. vi. fig. 1. *M. anchietæ*, sp. n., Guimarães, J. Sci. Lisb. xxxvii. pl. i. fig. 3, Angola.

STERNOPTYCHIDÆ.

GILL, T. Note on the *Sternoptychidæ*. P. U. S. Nat. Mus. vii. pp. 349-351, pl. ii. fig. 7.

The author is of opinion that this family should be limited to the genera *Sternoptyx* and *Argyropelecus*, and proposes the name *Iniomi* for a group, including the families *Chauliodontidæ* and *Sternoptychidæ*, characterized by the mode of articulation of the scapular arches. A synonymy of the latter family is given. The skeleton of *Sternoptyx diaphanus* is figured, pl. ii. fig. 7.

STOMIATIDÆ.

Neostoma batyphillum (g. & sp. nn., Vaill., ined.), noted and figured; Filhol, La Nature, 1884, p. 184, fig. 1.

Eustomias obscurus (g. & sp. nn., Vaill., ined.), noted and figured; id. t. c. p. 185, fig. 3, and Nature, xxix. p. 484, fig. 2.

SALMONIDÆ.

DAY, F. On Races and Hybrids among the *Salmonidæ*. P. Z. S. 1884, pp. 17-40, 376-380, & 581-593, pls. lvi. & lvii. (Extract in Am. Nat. xviii. pp. 1158-1160.)

Contains a detailed account of a series of experiments carried out at the Howietoun breeding-ponds, where various crosses between the different forms of Charr, or Charr with Trout, have been produced by artificial means. Statistics are given of mortality, monstrosities, rate of growth, &c.

Salmo levenensis, ♀, and *S. fontinalis*, ♂: hybrid, named *zebra*, described and figured; Day, P. Z. S. 1884, p. 585, pl. lvi. *S. fontinalis* and *S. alpinus*, ♂: hybrid described and figured; id. t. c. p. 586. *Salmo* and *levenensis*: notes on large specimens from Otago and Loch Lomond, with special reference to the mandibular hook of the male; id. t. c. pp. 588-593, 3 woodcuts. *S. alpinus*, L., redescribed and figured; Sundman, Finlands Fisk. pt. ii. p. 15, pl. v.

Salvelinus stagnalis, Fabr. (= *Salmo alipes*, Gthr.), distinguished from *S. naresii*, Gthr., redescribed, and a table of measurements given; Dresel, P. U. S. Nat. Mus. vii. p. 255.

FATIO, V. Les Corégones de la Suisse. Arch. Sci. nat. xii. pp. 433-437.

KLUNZINGER, C. B. Ueber die Felchenarten des Bodensees. JH. Ver. Württ. xl. pp. 105-128.

Critical remarks on Nüsslin's paper [*cf.* Zool. Rec. xix. *Pisces*, p. 28], and notes on the following species:—(1) Gangfische und Blaufelchen: *Coregonus wartmanni*, p. 116; and *exiguus*, Klunz., = *macrophthalmus*, Nüssl., = *wartmanni*, Rüpp (part). Siebold, Gthr., = *Salmo maranula*, Hartm. (*nec* Bl.), p. 117. (2) Sandfelchen und Kilchen (Kropffelchen): *Coregonus lavaretus*, L., = *fera*, Jur., p. 126, and *hiemalis*, Jur., p. 127.

NÜSSLIN, O. Ueber das Wesen der Species bei den Nordalpinen Coregonen. Amtl. Ber. lvi., Vers. deutsch. Naturf. u. Ärzte, Freiburg. i. Br. 1883 (1884) pp. 113-116.

Coregonus albula, L., redescribed and figured; Sundman, Finlands Fisk. pt. ii. p. 18, pl. vi. *C. nelsonii*, sp. n., Bean, P. U. S. Nat. Mus. vii. p. 48, Alaska.

CLUPEIDÆ.

COMBARDO, A. C. La Morfologia della colonna vertebrale dei Clupeidi (Jordanont.). Nat. Sicil. iii. pp. 336-339, pls. iv. & v., and iv. pp. 37-40.

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MATTHEWS, J. D. Report on the Sprat Fishing during the Winter of 1883-84. Rep. Scot. Fisheries, ii. App. F, No. iii. pp. 48-60, pl. iii.

Clupea sprattus and *harengus* described and figured.

EWART, J. C. Natural History of the Herring. Rep. Scot. Fisheries, ii. App. F, No. iv. pp. 61-72, pls. iv. & ix.

— On the Natural and Artificial Fertilization of Herring Ova. P. R. Soc. xxxvi. pp. 450-461, and Bull. U. S. Fish. Comm. iv. pp. 193-197. [Extract in J. R. Micr. Soc. (2) iv. p. 862.]

— Note on Deserted Spawning Grounds of the Herring. P. Phys. Soc. Edinb. 1884, pp. 270-273.

CHAPMAN, P. Habits of the Shad and Herring, as they appear in the Potomac River to one who has watched them for fifty years. Bull. U. S. Fish. Comm. iv. pp. 61-64.

shape
and he *onema oglinum*, Le S. (= *O. thrissa*, auct., *nec Clupea thrissa*, These res by Jordan, P. Ac. Philad. 1884, p. 42.

Kowalewsky *eurystole*, nom. n. (= *S. perfasciatus*, J. & G.); Swain & Meek, P. Ac. Philad. 1884, p. 35, Wood's Hall, Mass.

Dussumieria stolidifera, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. vii. p. 25, Key West, Florida.

Elopopsis. Notes on 4 known species of this genus, and figures of a specimen undetermined from the Chalk of Monte S. Agata, Goritz; Bassani, JB. geol. Reichsanst. xxxiv. pp. 403-406, pl. ix. figs. 1 & 2.

GYMNOTIDÆ.

Rhamphichthys (*Brachyrhamphichthys*) *brevirostris*, Steind., p. 37, and *mirabilis*, Steind., pl. ix. fig. 1; Steindachner, Denk. Ak. Wien, xlii. (1880).

MURÆNIDÆ.

Cæcula bascanium, sp. n., Jordan, P. Ac. Philad. 1884, p. 43, Egmont Key, Florida.

Ophichthys cobra and *naja*, spp. nn., De Vis, P. Linn. Soc. N. S. W. viii. p. 455, South Sea Islands.

Anguilla cubana, Kaup., = *rostrata*, Le Sueur. Notes by Meek, Bull. U. S. Fish. Comm. ix. p. 111.

Myrophis egmontis, sp. n., Jordan, t. c. p. 44, Egmont Key, Florida.

LEPTOCEPHALI.

Leptocephalus affinis, p. 4, fig. 1, *inornatus*, fig. 2, and *sicanus*, fig. 3, p. 5, *borelli*, p. 6, fig. 4, *inæqualis*, fig. 5, and *maurolici*, fig. 6, p. 7, *gut-turosus*, p. 8, fig. 7, *peloritanus*, fig. 8, and *zancleus*, fig. 9, p. 9, *tenuirostris*, fig. 10, and *prestandrea*, fig. 11, p. 10, *exopas*, p. 11, fig. 12, spp. nn., Facciola, Atti Soc. Tosc. vi. pl. iv., Straits of Messina; *L. oxyrhynchus*, Bellotti, Atti Soc. Ital. xxvi. p. 177, woodcut, Messina.

LOPHOBRANCHII.

SWAIN, J., & MEEK, S. E. Notes on the Pipe-Fishes of Key West, Florida, with description of *Siphostoma mckayi*, a new species. P. U. S. Nat. Mus. vii. pp. 237-239.

Contains a synopsis of the species of the Atlantic coast of the United States. The name *S. barbarea* is proposed for *S. buirdianus*, Swain. (nec Dam.). *S. mckayi*, sp. n., p. 239, Key West.

Syngnathus trachypoma, sp. n., Günther, Rep. Zool. Alert, p. 30, Thursday and Prince of Wales Islands.

Doryichthys serialis, sp. n., id. t. c. p. 30, pl. iii. fig. b, Port Moller.

PLECTOGNATHI.

GILL, T. Synopsis of the Plectognath Fishes. P. U. S. Nat. Mus. p. 411-427.

The author supplements the characters already recognized for the order *Plectognathi* as follows: "Teleost fishes with the elements of the lower jaw consolidated in single pieces representing the two rami, the supra-maxillaries and inter-maxillaries more or less closely connected, the interoperculum detached from the other opercular bones, reduced

pseudobranchiæ. Pectorals broad, fleshy, on a strong carpal. Lateral line continuous. Dorsal and anal rays few. Ventrals abdominal, rudimentary. For *T. bankiensis*, sp. n., De Vis, P. Linn. Soc. N. S. W. viii. p. 456.

Tetrodon insularum, Api, and *lavis*, South Seas, spp. nn., *id. t. c.* p. 456.

CYCLOSTOMATA.

HERMS, E. Ueber die Bildungsweise der Ganglienzellen im Ursprungsgebiete des Nervus acustico-facialis bei *Ammocoetes*. SB. bayer. Ak. 1884, pp. 333-352, 2 pls.

LEGOUIS, —. Recherches sur le pancréas des Cyclostomes et sur le pancréas et le foie dénués de canal abducteur propre chez le *Petromyzon marinus*. Ann. Soc. Sci. Brux. viii. (Mém.), pp. 187-304, pl. ii.

Part I. Concerning the pancreas in *Cyclostoma*. Part II. On the affinities of the great glands with the intestine and the absence of excretory canals in *Petromyzon marinus*. Part III. On the mode of digestion in *Petromyzon*, and its anatomical and histological relations with other species.

SACCHI, T. Nouvelles recherches sur la structure de la névroglie de la Rétine des Vertébrés. Arch. Ital. Biol. (3) vi. pp. 76-96. [*Petromyzon marinus*, p. 91.]

WELDON, W. F. R. On the Head Kidney of *Bdellostoma*, with a suggestion as to the Origin of the Supra-renal Bodies. Q. J. Micr. Sci. xxiv. pp. 171-181, pl. xv.

Petromyzon planeri = *fluviatilis*; Wajgel, Verh. z.-b. Wien, xxxiii. p. 311, pl. xvii. & 3 woodcuts.

LEPTOCARDII.

HATSCHKE, B. Mittheilung über *Amphioxus*. Zool. Anz. vii. pp. 517-520. [Preliminary notes.]

Branchiostoma. Günther gives notes on this genus supporting the views taken by Sundevall, and distinguishes the following 6 species:—*Branchiostoma elongatum*, Sund., p. 31, *belcheri*, Gray, *caribæum*, Sund., *lanceolatum*, Pall., and *cultellum*, Peters, p. 32, and *bassanum*, sp. n., p. 24, *bet.* Bass Straits; Rep. Zool. Alert.

TUNICATA.

BY

PROF. EDUARD VON MARTENS, M.D., C.M.Z.S.

LIST OF PUBLICATIONS.

- BENEDEN, E. VAN, & JULIN, C. Le système nerveux central des Ascidies adultes et ses rapports avec celui des larves Urodèles. Bull. Ac. Belg. (3) viii. No. 7, pp. 13-72, pls. i.-iv.
- , & —. La segmentation chez les Ascidies et ses rapports avec l'organisation de la larve. *Op. cit.* vii. pp. 431-447, 2 pls. (Also in Arch. Biol. v. fasc. 1, pp. 111-126, 2 pls.)
- DELLA VALLE, A. Sul Ringiovanimento delle colonie di *Diazona violacea* (Sav.). Rend. Acc. Nap. 1884. (French, in Arch. Ital. Biol. v. fasc. 3, pp. 329-332.)
- DOLLEY, C. S. On the Process of Digestion in *Salpa*. P. Ac. Philad. 1884, pp. 113-115. [Also in Ann. N. H. (5) xiv. pp. 72-74.]
- . Some observations not supporting intra-cellular digestion in *Salpa*. Zool. Anz. vii. pp. 705-708.
- DRASCHE, R. v. Ueber eine neue Synascidie (*Polyclinoides diaphanus*) aus Mauritius. Verh. z.-b. Wien, xxxiii. pp. 119-121, pl. v.
- . Ueber einige neue und weniger gekannte aussereuropäische einfache Ascidien. Denk. Ak. Wien, xlviii., 18 pp., 8 pls.
- FOL, H. Sur l'œuf et ses enveloppes chez les Tuniciers. Rec. Z. Suisse, i. pp. 91-160, pls. vii. & viii.
- , and heath, A. On the structure of the polycarp and the endocarp in the *Tunicata*. A paper read before the Lit. and Philos. Soc. of Liverpool. Zool. 8vo, 9 pp., 4 pls.
- JULIN, C. [See BENEDEN.]
- KOROTNEFF, A. Die Knospung der *Anchinia*. Z. wiss. Zool. xl. pp. 50-61, pls. iii. & iv.
- LEE, A. B. Recherches sur l'ovogénèse et la spermatogénèse chez les Appendiculaires. Rec. Z. Suisse, i. pp. 645-663, pl. xxxvi.

- LENDENFELD, R. VON. Note on the slimy coatings of certain *Boltenias* in Port Jackson. P. Linn. Soc. N. S. W. ix. p. 495.
- MAURICE, C., & SCHULGIN, —. Embryogénie de l'*Anch. B. n. prolifera*. Ann. Sci. Nat. (6) xvii., Art. 2, 46 pp., pls. ix. & x.
- ROULE, L. Sur le genre *Rhopalea*. C.R. xcvi. pp. 1294–1296.
- . Sur deux nouvelles espèces d'Ascidies simples. C.R. xcix. pp. 613 & 614.
- SABATIER, A. Sur les cellules du follicule et les cellules granuleuses chez les Tuniciers. Rec. Z. Suisse, i. pp. 423–458, pls. xxii. & xxiii. [Also in Rev. Montp. (3) iv. No. 1, pp. 106–140, 2 pls.]
- SCHULGIN, —. [See MAURICE.]
- SEELIGER, O. Die Entwicklungsgeschichte der socialen Ascidien. Jen. Z. Nat. xviii. pp. 45–120, 8 pls.
- TODARO, F. Sopra i canali e le fessure branchiali delle Salpe. Atti Acc. Rom., Trans. viii. fasc. 15, pp. 348–350.
- ULIANIN, B. Die Arten des Gattung *Doliolum* im Golfe von Neapel. (Fauna und Flora des Golfs von Neapel, herausgegeben von der Zoologischen Station zu Neapel, x.) Leipzig : 1884, 4to, 140 pp., 12 pls.
- WAGNER, N. Sur l'organisation de l'*Anchinie*. C.R. xcix. pp. 615 & 616.

ANATOMY AND PHYSIOLOGY.

Nervous System.

E. VAN BENEDEN & C. JULIN describe a ganglionic cord, composed of nervous cells, in the adult stage of *Perophora*, *Clavelina rissoana*, and *Molgula ampulloides*. It exists probably in all simple Ascidians; it starts from the hinder end of the brain or chief ganglion, extends all along the dorsal raphe, passes between the rectum and the entrance of the œsophagus, inclines then to the right, and terminates between the right and left lobes of the liver. Its homologue in the larvæ of the Ascidians is the visceral part of the myelencephalon. [Vide *suprà*.]

Nervous system of *Anchinia rubra*, by N. WAGNER, preliminarily, C.R. xcix. pp. 615 & 616; also Ann. N. H. (5) xiv. pp. 368 & 369; fully in Arch. Z. exper. (2) iii. pp. 151–188, pls. vii.–ix..

Digestion.

Controversy on the intracellular digestion of *Salpa* [vide *infra*, spec. part].

Development.

H. FOL describes the first stages of development in the eggs of the *Tunicatu*, especially the formation of the polar globules and of the

female pronucleus and the granulated corpuscles of the larval test; these and the retinuous layer of the larva have no relation at all to the mantle of the adult animal, but they form a provisional protective organ, which only attains a certain importance in the genus *Doliolum*. Rec. Z. Suisse, i. pp. 91-160, pls. vii. & viii., & pp. 317 & 318.

A. SABATIER makes some objections to this paper, defending his own views; *t. c.* pp. 423-458, pls. xxii. & xxiii.

E. VAN BENEDEN states that the segmentation is essentially the same in *Corella*, *Phallusia*, *Perophora*, *Clavelina*, and *Leptoclinum*, and therefore probably in all Ascidiæ; the first plane of segmentation remains always recognizable, and becomes the median plane of the adult. The greater part of the observations were made on *Clavelina rissoana*. *Corella parallelogramma* produces two sorts of eggs, distinguished by the colour; both develop themselves in quite the same manner, but the difference of colour remains until the hatching of the larvæ. [Title, vide *suprà*.]

Development of *Amarœcium*, by MAURICE & SCHULGIN [vide *infra*, special part].

Development of *Doliolum*; budding of *Anchinia*; development of *Appendicularia* [see also special part.]

Biology.

with *ew Gregarina* in the intestines of *Ciona* and *Salpa*; Frenzel, Arch. mikr. Anat. xxiv. pp. 557 & 565, pls. xxv. figs. 18-23, and xxvi. figs. 35-46.

GEOGRAPHICAL DISTRIBUTION.

C. P. SLUITER states that he has found 14 species of simple *Ascidia* at Blitong, or Billiton, Malayan Archipelago, but does not name them; Zool. Anz. vii. p. 373-375.

Descriptions of new exotic species of simple *Ascidia*, with several interesting notes on their structure, by R. VON DRASCHE; Denk. Ak. Wien, xlviii., 18 pp., 8 pls. [Preliminary account in Anz. Ak. Wien, 1884, No. 9, p. 66; abstract in Ann. N. H. (5) xiii. p. 424.]

4 species of *Doliolum* (1 new) found at Naples, and described by B. ULIANIN [title, vide *suprà*].

ASCIDIÆ.

These remarks—Duthiers calls attention to microscopical differences of Kowalewsky the systematic determination of *Cynthia* and allied genera; C.R. Zool. Anz. pp. 1103-1106.

Cynthia mauritiana, *sacciformis*, *nodulosa*, *castaneiformis*, and *mirabilis*, spp. nn., the last remarkable by the branchial and cloacal apertures being placed at the opposite ends of the ovate body; Drasche, *t. c.* *C. roretzii*, sp. n.; hypophysial tubercle as in *Microcosmus herdmani*, ciliated canal toothed: *id. t. c.*

Microcosmus herdmani and *julinii*, spp. nn.; hypophysial tubercle in

the former formed of two cones inclined towards each other, upon which the ciliated groove is spirally twisted: Drasche, Denk. Ak. Wien, xlviit.

Polycarpa sulcata, sp. n.; hypophysial tubercle with numerous crateriform apertures of the hypophysial canal: *id.*

Corella novaræ, sp. n., *id.* t. c.

Pleurociona, subg. n. of *Ciona*. *C. (P.) edwardsii*, sp. n., Roule, C.R. xcix. p. 613.

Ascidia elongata, sp. n., *id.* *ibid.*

Rhopalæa common at Marseilles on the bottom surrounding the *Zosteræ* in muddy sands at depths of from 25-70 metres. It approaches the *Clavelinidæ* by its general facies, but possesses a more complex organization, and does not reproduce by gemmation; the viscera are situated behind the branchia as in *Ciona*; the branchial wall has longitudinal folds, as in *Phallusia*. L. Roule, C.R. xviii. pp. 1294-1296. [Also Ann. N. H. (5) xiv. pp. 71 & 72; J. R. Micr. Soc. (2) iv. p. 552.]

R. VON LENDENFELD states that a stalked solitary Ascidian, somewhat like *Boltenia australis*, in depths between 6 & 10 fath. in Port Jackson, is covered by a slimy coating of pale brick red-colour, which consists of the eggs of the Ascidian; P. Linn. Soc. N. S. W. ix. p. 495.

SYNASCIDIÆ.

W. A. HERDMAN treats of the classification of the *Synascidiæ*; Nature, xxviii. pp. 429-431.

C. MAURICE & — SCHULGIN state that in the Mediterranean specimens of *Amarœcium proliferum* budding obtains in summer and sexual reproduction in winter, but that the individuals which produce eggs are different to those which produce buds; the eggs are fecundated in the breeding chamber; the development of the egg, as soon as the exoderm is formed, resembles very remarkably that of the bud; the gastrula is epibolic; a part of the yolk is destined for the future nourishment of the larva; there is no primary cavity between the exoderm and entoderm; the mesoderm is due to free formation of cells, and gives origin to the endostyle, to the muscles of the body and of the tail, and to the gills. *Amarœcium* is to be placed between the stoloniferous *Ascidie*, e.g., *Perophora*, and those with more differentiated colonies and a common cloaca, e.g., *Botryllus*. Ann. Sci. Nat. (6) xvii. No. 2, 46 pp., 2 pls.

Polyclinoides, subg. n. of *Aplidium*. Anal tongue far distant from the cloacal opening; form of the branchial sac and of the postabdomen. c. *Polyclinum*. *P. diaphanum*, sp. n., Mauritius and Philippines, Pl. Verh. z.-b. Wien, xxxiii. pp. 119-121, pl. v. figs. 5-10.

A. DELLA VALLE treats of the renovation of the colonies of *L. violacea* (Sav.); Rend. Acc. Nap. 1884.

CYCLOMYARIA.

B. ULIANIN gives a full historical, anatomical and embryological account of the genus *Doliolum*, which he thinks to be nearer allied to

Anchinia than to any other genus. He characterizes it, according to his researches on 4 Mediterranean species, as follows:—External mouth little developed, containing no cells; a spiral of vibratory bands anterior to the ganglion. Nurse with an oblique gill-lamella, having four pairs of clefts; oral aperture surrounded by ten marginal lobules; on the dorsal side, near the cloacal margin, a cylindrical projection; nine completely closed muscular rings, the seventh sending a diverticulum into the basis of the dorsal projection; a stolo prolifer directly beneath the heart; the ganglion in the fourth, the vibratory pit in the third intermuscular space; an otocyst in the fourth, at the left side; when the nurse is about to propagate, the nutritive and respiratory organs decay, and the muscular rings increase. The sexual generation is polymorphous, comprehending nutritive, nursing, and reproductive individuals. The nutritive individuals are unable to live independently; they remain for life fixed on the dorsal projection of the nurse, and are destined for its nourishment; they are transversely dilated, the mouth large, the gill-lamella not curved, with many clefts, cloacal cavity very flat, its aperture extraordinarily large, its base thereby forming a part of the outside of the animal; anus opening externally; only the two muscular rings near the apertures of the body well developed; genital organs rudimentary, no propagation. The nursing individuals also with rudimentary genital organs, and not propagating, but freely swimming; body tun-shaped, with eight well-developed muscular rings; gill-lamella different according to the species; the stalk by which the young animal is fixed to the nurse remains for life on the ventral side as a projection, which bears and gives nourishment to the buds of the generative individuals. These last perfectly resemble, in structure, the nursing individuals; the genital organs are situated on the left, the stalk disappears with age. The egg produces a tailed larva, which transforms itself into the nurse, the tail disappearing.

The known species of the Mediterrean Sea are the following:—(1) *D. muelleri* (Krohn, 1852), (2) *rarum* (Grobben), (3) *ehrenbergii* (Krohn), including *denticulatum* (Krohn) and *troscheli* (Gegenbaur); these 3 observed by the author at Naples. *D. nordmanni* and *troscheli* (Krohn) are nurses of the first species. *D. gegenbauri*, sp. n., from Villafranca and Messina, nurse unknown. [Title, vide *suprà*.]

Anchinia. A. KOROTNEFF describes two sorts of moving corpuscles on the surface of *Anchinia*, unicellular amœboid and multicellular pear-shaped ones, the former developing themselves gradually into the latter; and he describes the further development of them into distinct zooids. These resemble generally those which have been described by Barrois & Kowalewsky [see Zool. Rec. xx. *Moll.* pp. 103 & 104], but their genital organs were only imperfectly developed, and then produced a large number of the amœboid cells. He tries to compare this development with that of *Doliolum*, and thinks that there are three different generations:—(1) one asexual, still unknown, producing by gemmation (2) the imperfectly sexual zooids observed by himself, which produce on their surface and in their pharynx (3) another set of zooids, which become perfectly sexual, and are those observed by Barrois & Kowalewsky. Z. wiss.

Zool. xl. pp. 50-61, pls. iii. & iv. [abstract in J. R. Micr. Soc. (2) iv. p. 369].

The same defends himself against a view imputed to him by Ulianin ; Zool. Anz. vii. p. 89.

Nervous system of *Anchinia rubra* [vide *suprà*, p. 2].

SALPÆ.

C. S. DOLLEY opposes the statement of Korotneff that digestion in *Salpa* is effected by a huge amœboid cell or plasmodium carrying on a form of parenchymatous digestion; the lumen of the intestinal canal, on the contrary, is completely free throughout, but often filled with a mucous thread, which originates from the endostyle, and acts as a means for catching the food-particles from the ingurgitated water. P. Ac. Philad. 1884, pp. 113 & 114, and Ann. N. H. (5) xiv. pp. 72-74 ; also Zool. Anz. vii. pp. 705-708 [abstract in J. R. Micr. Soc. (2) iv. p. 732].

The channels and slits in the gill of *Salpa* are the subject of a paper by F. TODARO, Atti Acc. Rom. Trans. viii. fasc. 15, pp. 348-350.

W. K. BROOKS & R. M. GOODMAN discuss alternation of generations in *Salpa* ; Nature, xxx. pp. 367-370 & 463.

APPENDICULARIÆ.

A. B. LEE describes the formation of the eggs and the spermatozooids in the *Appendiculariæ*, and comes to the conclusion that both have their origin in nearly the same manner from absolutely homologous mother-cells in the same part of the common gland and by an equal number of divisions, but that the eggs are derived from the nucleus of the mother-cells ; the spermatozooids are extra-nuclear. Rec. Z. Suisse, i. pp. 645-663, pl. xxxvi.

MOLLUSCA.

BY

PROF. EDUARD VON MARTENS, M.D., C.M.Z.S.

LIST OF PUBLICATIONS.

- ANCEY, C. F. Sur les Mollusques des parties centrales de l'Asie. Nat. Sicil. ii. pp. 141, 163, 209, & 266.
- Contribution à la faune malacologique Indo-Thibétaine. Ann. Mal. i. pp. 381-397.
- Observations sur quelques *Macularia*. Nat. Sicil. i. pp. 285-295 (1882).
- Études sur quelques Mollusques terrestres inédits ou mal connus. *Op. cit.* iii. pp. 344-346.
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- ANGAS, G. F. On the terrestrial *Mollusca* of Dominica. P. Z. S. 1883, iv. [1884] pp. 594-597.
- ARANGO, R. Descriptions of new species of terrestrial *Mollusca* of Cuba. P. Ac. Philad. 1884, pp. 211 & 212, woodcuts.
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- BACHMANN, O. Die Mollusken der Umgebung Landsbergs-a.-L., Programm der Kgl. Kreis. Ackerbauschule zu Landsberg, 1883-84, shape p. and he a.
- These res. D. Die Excretionsorgane von *Cyclostoma elegans*. Zool. Kowalev vii. pp. 474 & 475.
- B. S. S. T. Sur l'introduction de l'eau dans le système circulatoire des Lamellibranches, et sur l'anatomie du pied des *Lucinidae*. Lille: 1884, 8vo, 12 pp.
- BAUDON, A. Troisième catalogue des Mollusques vivants du Département de l'Oise. Paris: 1884. J. de Conch. xxxii. pp. 193-325, pls. viii.-x.; also separately (Paris: 1884, 133 pp., 3 pls.). 1884. [VOL. XXI.] c 5

- BECHER, E. F. The Land and Fresh-water *Mollusca* of the Maltese Islands. J. of Conch. iv. pp. 229-237.
- BEDDARD, F. E. On some Points in the Anatomy of the Nervous System of the Pond Snails *Planorbis* and *Limnaeus*. P. R. Soc. Edinb. xi. 1881-82, pp. 576-583, pl. iv. A.
- BEECHER, E. C. [See CALL.]
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- WEISS, A. Ueber das Vorkommen der Gehäuseschnecken und Muscheln in der südlichen Oberlausitz. SB. Ges. Isis, 1883, pp. 102-104.
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- Journal de Conchyliologie, by H. CROSSE & P. FISCHER, vol. xxxii. (3 série, vol. xxiv.) Paris: 8vo, 435 pp., 13 pls.
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- Jahrbücher der deutschen Malakozoologischen Gesellschaft. Frankfurt-on-the-Maine: 8vo, 398 pp., 9 pls.
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- Journal of Conchology, vol. iv. Nos. 5-8. London and Leeds: 8vo, pp. 129-256, pls. vi.-viii.
- Bulletino della Società malacologica Italiana. Pisa: vol. x. pts. 1 & 2, pp. 1-28, pls. i.-v.
- Annales de Malacologie (interrupted since 1870), 8vo, vol. i. pt. 4, pp. 321-428, with 2 pls.
- Bulletins de la Société malacologique de France (président, G. Servain), tom. i. Paris: 1884, 8vo, 384 pp., 5 pls.

P. FISCHER continues his valuable manual [*cf.* Zool. Rec. xviii. *Moll.* p. 10, and xix. *Moll.* p. 13], treating in fasc. vi. & vii. of the *Opisthobranchia* and part of the *Pectinibranchia*. In the latter he subdivides the genera into subgenera, and these again into sections; the new ones will be mentioned below:

The third volume of TRYON's "Structural and Systematic Conchology" treats the *Pulmonata*, *Dentaliidae*, and Bivalves in the same manner as the preceding one the Cephalopods and marine Gastropods [*Zool. Rec.* xx. *Moll.* p. 12], giving a very complete enumeration of the known genera and subgenera, with their dates, synonyms, chief characters, geographical range, and typical species, sometimes also their etymology and notes concerning their habits, the last chiefly extracted from Jeffreys' British Conchology. The alphabetical index to vols. ii. & iii. together, 67 pp., will be very useful for the practical conchologist. The plates contain figures of all genera and many subgenera, chiefly shells, but not exclusively.

Parts 41 & 42 of SOWERBY'S Thesaurus Conch. treats of the genera *Teredo*, *Kuphus*, *Gastrochaena*, *Fistulana*, *Saxicava*, *Rotella*, *Phasianella*, *Delphinula*, *Liotia*, *Stylifer*, *Vanikoro*, *Neritopsis*, *Planaxis*, *Tridacna*, *Hippopus*, *Pleurotomaria*, *Trigonia*, *Siliquaria*, and the *Pteropoda*.

J. P. A. GRASSET has published a systematic catalogue of his rich collection of recent shells, which, being in accordance with the modern classifications, may be useful to collectors for arranging their shells; the same will also find this catalogue correct in statements of localities.

ANATOMY AND PHYSIOLOGY.

E. RAY LANKESTER gives a general account of the *Mollusca*, chiefly with regard to their anatomy and development, and proposes the following classification:—

Phylum: *Mollusca*.

- (A) *Glossophora*. . . Class 1—*Gastropoda* (incl. *Heteropoda*).
 - 2—*Scaphopoda* or *Dentalia*.
 - 3—*Cephalopoda* (incl. *Pteropoda*).
- (B) *Lipocephala*. . . . 4—*Acephala* or *Lamellibranchia*.

The *Gastropoda* are subdivided as follows:—

Sub-class 1—*Isopleura*: *Chitons*, *Neomeniidae*, and *Chaetoderma*.

Sub-class 2—*Anisopleura*.

(a) *Streptoneura*.

Ord. 1—*Zygobranchia*: *Patella*, *Haliotis*, *Fissurella*, &c.

Ord. 2—*Azygobranchia*: The majority of the shell-bearing marine Gastropods and the *Heteropods*.

(b) *Euthyneura*.

Ord. 1—*Nudibranchia*.

Ord. 2—*Pulmonata*.

Ord. 3—*Opisthobranchia*.

The new terms "gonad" for sexual organ, "osphradium" for sensory organ, and "ctenidium" for gill, are introduced. *Encyclopædia Britan-*

nica, 9th ed. xvi. pp. 632-697. [An abstract with critical remarks by F. W. Dall, Science, No. 71, pp. 730-732; see also J. R. Micr. Soc. (2) iv. p. 205.]

F. JICKEL publishes elaborate abstracts of some anatomical papers by Flemming, Blochmann, Sarasin, Griesbach, and Haller [Zool. Rec. xix. & xx.], in J.B. mal. Ges. xi. pp. 291-306.

C. GROBBEN describes the relations of the renal and genital organs in the Cephalopods. In *Sepia officinalis*, there is a pair of kidney sacs lined with epithelium, strongly glandular and opening to the exterior by proper papillæ; a ciliated opening leads into this kidney sac from a cavity lined with ciliated epithelium; this cavity contains the branchial hearts, the aortic heart, and the genital organs; the ovary is a ridge in this cavity formed of folds of peritoneal epithelium; eggs are caught up by the open end of an oviduct and conveyed through it to the mantle cavity. In *Eledone moschata*, the peritoneal space is not so large as in *Sepia*, and does not surround the heart; it is little more than a reproductive organ, its wall being almost completely occupied by the folds which give rise to the ova; but a narrow tubular channel runs from it into the kidney sac, opening there by a ciliated mouth, and lined with ciliated epithelium. In *Nautilus*, the cavity resembles that of *Sepia*; in other *Mollusca*, it is reduced to the pericardial space. *Dentalium* offers so many important points of affinity that the author pronounces it to be the remnant of the astral forms of the *Cephalopoda* (pp. 224-232, with woodcuts). The Pteropods, on the contrary, are regarded by him as much nearer to the *Gastropoda* than to the *Cephalopoda*, the suckers of *Pneumodermon* being a new acquisition, and the spirally twisted forms of the Pteropods, as *Limacina* and *Spirialis*, the oldest, the regular symmetry of the others an adaptation to the free-swimming habits, because the disposition of the internal organs is asymmetrical as in the *Gastropoda*. Finally, the author states that all *Mollusca* have a secondary cavity of the body, which communicates by a ciliated funnel with the renal organ, and is lined by a peritoneum, the organs within it being enveloped by a reflexed portion of the same; it is therefore homologous in all points of importance to the secondary cavity of the body in Annelids and Vertebrates. Arb. z. Inst. Wien, v. pp. 179-252, with 3 pls. (Abstract in Am. Nat. xviii. pp. 1271-1273.)

H. WEGMANN gives an anatomical description of *Haliotis tuberculata*, and points out many points of resemblance with the Bivalves. There are two organs of Bojanus which are very different from one another, but resemble the two sacs of Bojanus in the Bivalves; the genital organs consist only of the male and the female gland, which open both in the cavity of the organ of Bojanus; the auricle of the heart, the gill, and the sorta are double, as in the Bivalves, and the ventricle of the heart is perforated by the intestine; the situation of the organs is somewhat altered by the strong development of the shell muscle. Arch. Z. exper. (2) ii. pp. 289-378, pls. xv.-xix. [preliminary account in C.R. xeviii. pp. 1387-1389; abstract in J. R. Micr. Soc. (2) iv. p. 730].

1. *Shell and Integument.*

E. EHRENBAUM describes in detail the structure of the shell in several Bivalves; *Z. wiss. Zool.* xli. pp. 1-47, pls. i. & ii.

Note on the chemical constitution of the beaks of Cephalopods, the periostracum of *Modiola*, and the horny shell of *Velutina coriacea*, by W. H. DALL, *Am. Nat.* xviii. pp. 777-778.

F. HOUSSAY describes the structure, formation, and fastening of the operculum, and the pedal glands in a considerable number of *Pectinibranchiata* [see special part], and comes to the conclusion that the operculum is homologous neither with the second valve of the Bivalves, nor with the byssus, but is quite a peculiar organ, distinct from both by its place and its mode of growth; he distinguishes two kinds of pedal glands, the pedal proper and the suprapedal; the latter are very complicated in the genera which have an operculum, and are the organs by which the operculum is formed. *Arch. Z., expér.* (2) ii. pp. 171-288, pls. vii.-xiv. [preliminary account in *C.R.* xcviii. No. 4, pp. 236-238; translated into English in *Ann. N. H.* (5) xiii. pp. 304-306; abstract in *Rev. Sci.* (3) iv. No. 11, p. 343, and *J. R. Micr. Soc.* (2) iv. pp. 207 & 208].

The epithelium and gelatinous tissue, muscles, and nerves of *Cymbulia* and *Tiedemannia*, *Carinaria*, and *Pterotrachea* are the subject of histological researches by J. PANETH; he agrees with Gegenbaur that the gelatinous tissue corresponds to the mucous tissue of the *Vertebrata*; the skin on the edges of the fins in *Cymbulia* and *Tiedemannia* has a cubical or cylindrical epithelium, provided with many nerves and sensitive bristles; in *Pterotrachea*, there are organs, probably sensitive, and perhaps analogous to those in the lateral line of fishes. *Arch. mikr. Anat.* xxiv. pp. 230-262, pls. xiv. & xv.

2. *Muscular System.*

PLATEAU's paper concerning the force of the adductors in Bivalves [*Zool. Rec.* xx. *Moll.* p. 13] is also contained in *Arch. Z. expér.* (2) ii. pp. 145-170.

The histological structure of the muscles in *Cymbulia* and *Tiedemannia*, *Pterotrachea* and *Carinaria*, described by J. PANETH, *Arch. mikr. Anat.* xxiv. pp. 262-269, pls. xv. & xvi.

3. *Digestion.*

E. BOURGUELOT publishes a separate pamphlet on the digestive bearing *Cephalopoda* [vide *suprà*].

The microscopical structure of the digestive organs of *Helix pomatia* is the subject of a paper by E. BONARDI in *Atti Acc. Tor.* xix. pp. 33-46, pl. i. [abstract in *J. R. Micr. Soc.* (2) iv. p. 549]. The same author examines the action of the digestive fluid of some land snails on starch and allied substances; *Boll. scient.* vi. No. 2, pp. 40-53 [abstract in *J. R. Micr. Soc.* (2) iv. p. 459].

F. FRENZEL continues his researches on the microscopical contents of the "mitteldarmdrüse" (gland of mid-intestine), or the so-called liver of the *Mollusca*: he describes the cells which contain granules, and these granules themselves, which differ in colour and size in different genera; treats of their chemical properties; describes further the club-like cells, the aspect of which is also very different according to the genera; and, finally, the lime-cells. The granular cells are found in all *Mollusca*, except the *Cephalopoda*, the club-shaped cells are absent only in *Chiton*, *Patella*, probably also in *Fissurella* and Pteropods, perhaps also in some Bivalves; the lime-cells are probably absent from all Bivalves and *Heteropoda*, and in some genera of the *Gastropoda*. Arch. mikr. Anat. xxv. pp. 48-84, pl. ii.

R. ROESSLER gives a preliminary account of his researches on the formation of the teeth of the radula by epithelial cells, "odontoblasts," in the different orders and classes of the *Mollusca*; Zool. Anz. vii. pp. 540-543.

4. Circulation.

A. NALEPA describes the vascular system of *Zonites algirus* (L.); SB. Ak. Wien, 1883, pp. 237 *et seq.* [abstracts in J. R. Micr. Soc. (2) iv. p. 208, and JB. mal. Ges. xi. pp. 291-297].

A. GRIESBACH's elaborate paper on the existence of distinct lacunar Ptees and pori aquiferi in the Bivalves, Z. wiss. Zool. xxxviii pp. 1-44, pl. i., was registered in the preceding Record, *Moll.* p. 5, but was by inadvertence omitted on p. 14; an abstract of it is in J. R. Micr. Soc. (2) iii. pp. 353 & 354. Some notes by the same concerning statements made by other authors; Zool. Anz. vii. pp. 169-171.

W. FLEMMING has defended, in Z. wiss. Zool. xxxix. pp. 137-144, the existence of what he calls mucous cells as being really closed cells with a distinct nucleus, which cannot be filled by injections.

P. SCHIEMENS recapitulates the question whether the *Mollusca* are able to take in water from outside by distinct apertures, and states by some experiments that *Natica josephinia* really takes in a considerable quantity of water in very short time in order to extend itself, probably by pores at the border of the foot, and that this water remains separated from the blood, as it is again ejected by the contraction of the animal. MT. z. Stat. Neap. v. pp. 509-543.

T. BARROIS treats once more the question concerning the entrance of water from outside into the blood-vessels of the Bivalves [vide *suprà*].

R. HANITSCH on the same with regard to *Cyclas* and *Anodonta* [vide *suprà*].

5. Respiration.

The gill of *Mollusca* is the subject of a paper by H. L. OSBORN, J. Hopk. Univ. Circ. No. 32, July, 1884, p. 128; and those of the Prosobranchiate *Mollusca* of another in Stud. Biol. Lab. Hopkins Univ. iii. pt. i. pp. 37-48.

6. *Excretion and Secretion.*

D. BARFURTH confirms the presence of two kinds of excretory organs in *Cyclostoma elegans*, which were described by E. Claparède in 1858, and states that one of them, the so-called concretory gland, contains granules of uric acid, but that the so-called kidney contains neither this nor an allied chemical substance, and rather resembles in structure and function the organ of Bojanus of the Bivalves; Zool. Anz. vii. pp. 474 & 475.

According to P. DE MEURON, the kidney of *Helix* is formed partly by an ectodermal invagination and partly by mesodermal structures, the two uniting early and so closely that they cannot be distinguished; J. R. Micr. Soc. (2) iv. p. 279, and Am. Nat. xviii. pp. 833 & 834.

H. v. ILLERING states that in *Vaginulus* and in *Bulimus oblongus* the ureter is wanting, and the kidney opens directly into the pulmonary cavity; in *Bulimus auris-leporis* and *papyraceus*, that part of the pulmonary cavity which communicates with the kidney is distinct from the other, and an imperfect ureter is present; in *Bulimus blainvillianus*, the ureter is perfect. Z. wiss. Zool. xli. pp. 259-283, pl. xvii.

A lecture on the structure and function of the renal organ in the *Mollusca* by Dr. LANDSBERG, Schr. Ges. Königsb. 1884, pt. 2, p. 41.

7. *Nervous System.*

The histological structure of the nerves in the larger *Pteropoda* and *Heteropoda* is described by J. PANETH; the muscular nerves terminate in a plexus, but a direct coalescence of a nervous fibrilla with a muscular one could not be seen: Arch. mikr. Anat. xxiv. pp. 269-286, pls. xv. & xvi.

The nervous system of *Parmophorus australis* is described by BOUTAN, C.R. xcvi. pp. 1385-1387 [abstract in J. R. Micr. Soc. (2) iv. p. 730].

The central nervous system of *Onchidium* is incidentally described by R. BERGH, Ann. N. H. (5) xiv. pp. 263 & 264.

F. E. BEDDARD has made some observations concerning the nervous system of *Planorbis* and *Limnæa*; the former has a small unpaired ganglion between the pedal ganglia; the whitish body lying in the cerebral ganglion, unpaired in *Planorbis*, and forming a pair in *Limnæa*, is probably a gland. P. R. Soc. Edinb. xi. 1881-2, pp. 576-583, pl. iv.a.

L. BÖHMIG describes the microscopical structure of the central nervous system of *Helix pomatia* and *Limnæa stagnalis*; the brain of *Helix pomatia* is higher developed than that of *Limnæa*, the ganglion cells being more differentiated in size and polarity, and distinct regions distinguishable in it, which is not the case in *Limnæa*. [Title, vide *supra*.]

The microscopical structure of the nerves in the peritoneum of *Doris tuberculata* is the subject of a paper by B. HALLER, Arb. z. Inst. Wien, v. pp. 253-270, 1 pl.

8. Organs of Sense.

The retina of the *Cephalopoda* is the subject of a treatise by H. GRENACHER, *Abh. Ges. Halle*, xvi. pp. 207-256, with 1 pl.

B. SHARP states that there are no distinctly differentiated eyes in *Ostrea virginica*, *edulis*, *Anomia ephippium*, *Lima squamosa*, *Avicula sterna*, *Arca incongrua* and *americana*, *Cardium muricatum*, *edule*, *magnum*, or *Tellina tenta*. Pigmented epithelial cells, with a fine homogeneous highly refractive cuticle at the free end, are scattered more or less over the whole mantle, but principally at the posterior end, in *Ostrea virginica* and *edulis*, and their power of vision is proved by experiment; the same pigment cells are found in many other *Asiphoniata*. In *Dreissenia polymorpha*, *Venus mercenaria*, *verrucosa*, and *Tapes decussata*, these pigment cells are concentrated on that part of the mantle (siphon) which extends farthest from the shell; they are without any particular protection, the siphon being able to be retracted wholly within the shell; but in *Mya arenaria*, in which it is scarcely retractile, the pigment cells are placed in grooves at the base of the tentacles and form an intensely black band at both siphonal apertures, but other pigment cells are scattered for quite a distance below the end. A higher step is offered by *Solen vagina*, *ensis*, and *Mactra solidissima*, the pigmented grooves being only at the bases of the tentacles, and the grooves more or less specialized in number and complexity; they approach somewhat the eyes of *Patella*, which are also without a lens and open, bathed with the surrounding medium. The larvæ of some of the *Lamellibranchiata* have also eyes at the oral extremity of the body, but these disappear in the progress of development, that part of the body not being exposed to the light; the *Lamellibranchiata* exhibit therefore the obliteration by disuse of true eyes, and the formation of adaptive visual organs in different steps of specialization. With regard to *Pecten*, the author thinks that the organs which have been generally described as eyes, and which are provided with a distinct retina and a metallic tapetum, but devoid of a true pigmented layer in any direct relation to either the nerve or the retina, may be the organs of some other sense, and that only the pigmented cells with refractive ends answer to the limited vision which this genus possesses, and which seems not to surpass that of other *Asiphoniata*. *MT. z. Stat. Neap.* v. pp. 447-470, pl. xxvi.

Several genera of *Chitonidae* exhibit microscopical eyes in the shape of highly refractive, convex, circular spots, surrounded by a narrow zone of dark pigment and placed in pyriform pits, excavated in the substance of the shell; they have a calcareous cornea and a distinct optic nerve, which penetrates to them in a strand of soft tissue by the channels within the shell; they are found only in the *area laterales* or in the line of demar-

ation between these and the *area centralis*, and are very numerous—at least 8500, and probably more, in a large *Corephium aculeatum*; they are surrounded by a number of smaller pores or pits, in which also a dice-box shaped plug of soft tissue and the end of a finer branchlet of nerves are situated, and which are probably organs of touch. Such eyes have been observed and are described here of *Schizochiton incisus*, *Acanthopleura*

spiniger, *Corephium aculeatum*, *Tonicia marmorata*, and *Onithochiton*; no eyes, but the same organs of touch have been found in *Chiton* s. str. (*magnificus* and *marmoratus*), in *Chitonellus*, and probably also in *Molytricia*, *Maugeria*, *Lorica*, and *Ischnochiton*. MOSELEY, Ann. N. H. (5) xiv. pp. 141-147 [abstracts in J. R. Micr. Soc. (2) iv. p. 726, and Nature, xxx. No. 780, p. 575].

For sensitive organs in the skin of *Pteropoda* and *Heteropoda*, see J. PANETH, *suprà*, p. 16.

9. Organs of Generation.

M. VON BRUNN states that he has found two kinds of spermatozooids in *Ampullaria*, *Murex*, *Cerithium*, *Nassa*, *Fusus*, Arch. mikr. Anat. xxiii. pp. 413-499, 2 pls.; and in *Columbella*, *Marsenia*, *Aporrhais*, *Cassidaria*, *Dolium*, *Tritonium*, and *Vermetus*, Zool. Anz. vii. pp. 546 & 547.

A. SCHNEIDER states that he has found spermatophors, containing active spermatozooids, within the ovaries of *Anodonta cygnea* in August and in those of *Ostrea edulis* in November: he surmises that the eggs are fecundated before they have reached their full size, and that after fecundation a year elapses before the segmentation and further development begins. Schneider's Zool. Beitr., i. pt. 2, pp. 127-129, pl. xix. fig. 16.

10. Development.

Note on the development of *Limax* by S. JOURDAIN, C.R. xcvi. pp. 308-310 [abstract in J. R. Micr. Soc. (2) iv. p. 209].

Preliminary account of the development of *Cyclas cornea* by H. E. ZIEGLER, Zool. Anz. vii. pp. 595-598 (cf. Z. wiss. Zool. xli. 1885, pp. 524-569, pls. xvii. & xviii.).

Development of the digestive tube of *Limax*; S. JOURDAIN, C.R. xcvi. pp. 1553-1556 [abstract in J. R. Micr. Soc. (2) iv. p. 731].

Note on the kidney in the embryo of *Helix* by P. DE MEUDON, C.R. xcvi. pp. 693-695.

Abstract of JOUBIN's paper on the development of the gills in the *Cephalopoda* in Ann. N. H. (5) xiii. pp. 67 & 68.

J. CARRIÈRE states that the embryonal byssal gland of *Anodonta* described by himself and M. Braun has nothing to do with the so-called byssal filament, or rather adhesive filament, by which the very specimens of *Anodonta* and *Unio* attach themselves to fish; the byssal gland is also found in *Cyclas* [*Sphaerium*] and other Bivalves. *Ann. N. H.* (5) xiii. pp. 41 & 42.

J. BROCK publishes some observations concerning the development of the genital organs in *Limax agrestis*; he comes to the conclusion that the oviduct and vas deferens have, probably, a common origin with the hermaphrodite gland itself, and that their outer orifice is not formed by an invagination of the ectoderm; the atresia observed by C. Magenot [Zool. Rec. xx. Moll. p. 20] is consequently to be interpreted as want of full development. Nachr. Ges. Götting. No. 12, 1884, pp. 499-504.

11. *Stray Biological Notes.*

Influence of food on the color of the shell, *Helix aspersa* darkening by feeding exclusively on lettuce; Miss HELE, Nachr. mal. Ges. 1884, p. 109 (abstract from Science).

E. SCHUMANN tried to nurse newly-hatched specimens of *Helix nemoralis* in flower-pots of *Myosotis* and *Lysimachia*; within three months the few survivors had reached the size of $3\frac{1}{2}$ mm.; with regard to the bands, seven of them resembled the father, one the mother: the time from the fecundation to the spawning amounts to twenty-eight days, and from thence to the hatching again twenty days. Schr. Ges. Danz. (2) vi. p. 2.

Note on ducks transporting fresh-water clams by J. W. FEWKES in Auk, i. p. 195.

Bulinus eremita from Turkestan, after having been kept dry for $2\frac{1}{2}$ years, revived and ate, but died after 3-4 days; Goldfuss, Z. ges. Naturw. (4) iii. p. 196.

A *Gregarina* in the intestine of *Pterotrachea*; Frenzel, Arch. mikr. Anat. xxiv. p. 575, pl. xxvi. figs. 57-60.

12. *Abnormalities.*

H. SIMROTH states the existence of female, not hermaphrodite, specimens of *Limax levis*; SB. Ges. Leipzig, 1883, p. 74.

Arion empiricorum. Respiratory orifice sinistral; Baudon, J. de Conch. xxxii. p. 320.

Limax levis (Müll.) without tentacles; *id. t. c.* p. 209.

A. LOCARD treats of albinism and melanism in terrestrial and fresh-water Mollusca of France. He states that both are found in the shell and in the soft parts, but that the pigment of the eye is black even in albinos. Melanism is rare, and is found more in the South; albinism is not very rare in the North and in mountainous regions. [Title, vide *suprà*.]

Albino specimens of *Ferussacia subcylindrica* (L.), [*lubrica* (Müll.)], *Clausilia nigricans*, *Planorbis corneus* and *complanatus*; Baudon, J. de Conch. xxxii. pp. 256, 266, 321, & 322. Do. of *Valvata piscinalis* from Chumber Lake, Nottinghamshire; Taylor, J. of Conch. iv. p. 173. Of *Zonites radiatulus* in Yorkshire; Nelson, *t. c.* p. 223. Of *Clausilia rugosa* in South Hants, and of *Planorbis contortus* at York; Taylor, *t. c.* p. 228. Of *Clausilia* ^{highly dark} *P. corneus*, in Warwickshire; *id. t. c.* p. 228. Of *Clausilia* ^{dark pigment} *radiatus septemspiralis*; Tschapeck, Nachr. mal. Ges. 1884, the shell; the ^{dark pigment} *radiatus septemspiralis*; Tschapeck, Nachr. mal. Ges. 1884, penetrates to the ^{dark pigment} *radiatus septemspiralis*; Tschapeck, Nachr. mal. Ges. 1884, xxx. pl. viii. figs. 6 & 7.

Abnormal forms of *Limnaea stagnalis* described and figured as *varr. un. pleurotoma*, *cochlearia*, and *retusa*, by ROSENDAEL, in a separate pamphlet [title, vide *suprà*].

Keeled deformity of *Limnaea palustris* at Bromley; Taylor, J. of Conch. iv. p. 146, pl. i. fig. 6.

Scalar and scalaroid varieties of several species of *Helix*, *Succinea*, and

Planorbis; Baudon, J. de Conch. ^{h.} xxxii. pp. 320 & 322, pls. viii.-x. Of *Placostylus ouveanus*; Crosse, t. c. p. 329, pl. vii. fig. 4.

Sinistral specimen of *Helix hispida* and *Limnaea ovata*; Baudon, J. de Conch. xxxii. pp. 247, 248, 321, & 322, pl. ix. figs. 8 & 16. Of *Placostylus ouveanus*; Crosse, t. c. p. 328, pl. vii. fig. 3. Of *Valvata piscinalis* observed in Derbyshire; Taylor, J. of Conch. iv. p. 145.

Sinistral parents with dextral issue in *Helix aspersa*; Miss HELE, Nachr. mal. Ges. 1884, p. 109 (abstract from Science).

Buccinum undatum. Abnormal shell; Lovett, Zool. (3) viii. p. 490.

GEOGRAPHICAL DISTRIBUTION.

a. LAND AND FRESH-WATER MOLLUSCA.

1. Palæarctic Region generally.

H. JORDAN publishes a very interesting treatise on the geographical distribution of the Palæarctic land and fresh-water *Mollusca*. He discusses the conditions of the soil which are favourable or unfavourable to their life, and urges that calcareous soil is favourable for many of them, not so much on account of its chemical quality, as because it offers to them a great variety of light and shadow, open air and humidity, at the same place, in opposition to the greater uniformity of the primitive rocks; basalt is also favourable to the land snails. For the same reasons he distinguishes the species of land shells which are found chiefly on the sea-shore, those living in woods, those of stony hills, those found in houses, &c., and compares these categories with analogous cases among plants. In the more strictly geographical part, he re-introduces the circumpolar arctic province, which is wanting in the zoo-geographical systems of Selater & Wallace, and discusses at length its peculiarities:—*Pupa arctica* (Wallenb.), *shuttleworthiana* (Charp.) = *alpestris* (Alder), and *Helix harpa* (Say), are endemic, or at least very characteristic of it; others are more widely distributed in the temperate latitudes of Europe, Asia, and America, e.g., *Margaritana margaritifera*, *Physa hypnorum*, *Succinea patris*, *Pupa muscorum*, &c. Jordan excludes the Sahara, the Arabian Desert, Beluchistan, China proper, and the chief islands of Japan, from the Palæarctic province. The subdivisions which he adopts or proposes are the following:—

1. Germanic region. (A) North Sea and Baltic district, including Scotland, a part of Ireland, the southern half of Scandinavia and the Baltic provinces of Prussia and Russia; (B) Northern Russia to about 60° N. lat., and Siberia; (C) Celtic district, comprehending Ireland, England, and France; (D) The high mountains of Central Europe; (E) Carpathian-Caucasian district; (F) The mountains of moderate elevation in Germany, the land snails of which have generally a wide distribution over many parts of Europe.
2. Mediterranean region. (A) Turkish district; (B) Italian district; (C) Spain and Algeria.

3. The Atlantic Islands.

4. Central-Asiatic region. (A) Altaic-Baikalian district; (B) Turkestan; (C) Thibet.

Finally, also a malacological sketch of the tropical Asiatic (oriental of Wallace), and the Australian Provinces, including the Pacific islands, is given. There are 14 tables of distribution. *Nova Acta Ac. L.-C. Nat. cur.* xlv., No. 2, pp. 181-402.

P. FAGOT on the distribution of the European land and fresh-water *Mollusca*, in a separate pamphlet [title, vide *suprà*].

W. KOBELT describes and figures, in the fifth and sixth parts of the new series of the continuation of Rossmässler's Iconographic, several new species and interesting varieties of the genera *Limnea*, *Margaritana*, and *Unio*, from various parts of Europe, N. Africa, and Transcaucasia.

C. A. WESTERLUND gives a review of the known Palæarctic species of *Balea* and *Clausilia*, with descriptions [title, vide *suprà*].

2. Scandinavia and Northern Russia.

C. A. WESTERLUND publishes a little book on the land and fresh-water shells of Sweden, Norway, Denmark, and Finland [title, vide *suprà*], containing (in Swedish) short descriptions of the genera and species and indications of their geographical range within these countries. There are:—*Limax* 8 sp., *Arion* 5, *Hyalinia* 13, *Helix*, subgg. *Patula*, *Acanthinula*, *Gonostoma*, *Vallonia*, *Petasia*, *Trichia*, *Striatella*, *Helicella*, *Bradybæna*, *Eulota*, *Chilotrema*, *Monacha*, *Arionta*, *Tachea*, and *Helicogena*, in all 27 species, *Buliminus* 2, *Cochlicopa* 2, *Pupa* 25, *Balea* 1, *Clausilia* 12, *Succinea* 5, *Carychium* 1, *Limnea* 8, with several varieties, *Amphipeplea* 1, *Physa* 2, *Planorbis* 20, *Ancylus* 2, *Cyclostoma* 1, *Acme* 1, *Valvata* 8, *Paludina* 2, *Bythinia* 2, *Hydrobia* 1, *Neritina* 1, *Sphærium* 5, *Pisidium* 14, *Unio* 3, *Margaritana* 1, *Anodonta* 2, and *Dreissena* 1.

Baltic provinces of Russia. M. BRAUN enumerates 65 species of terrestrial and 51 of fresh-water *Mollusca*, known from the Baltic provinces of Russia, and refers also to their distribution in other parts of Russia. Finally, a list of 38 publications concerning the Russian land and fresh-water *Mollusca* is given [not quite complete; the Recorder's publications concerning the *Mollusca* found by Ehrenberg in the Ural and near Moscow (SB. nat. Fr. 1875), and concerning those collected by Polenoff in the gouv. Tambow (*op. cit.* 1878), Middendorff's paper in Bull. Soc. nat. Mosc. 1848, and Krynicki's first paper (*op. cit.* 1833), are omitted]. The same enumerates 21 terrestrial and 25 fresh-water species collected at Merreküll, Dubbeln, and gouv. Pskow (Baltic provinces of Russia), among which are *L. alvata antiqua* (Sow.), *Lithoglyphus naticoides* (Sow.), and *Sphærium solidum* (Norm.). SB. Ges. Dorp. 1884, pp. 47-51.

3. British Fauna.

Tables showing the numbers of known slugs, land shells and fresh-water shells for each county of the United Kingdom, in J. of Conch. iv. pp. 174-183.

Caithness. 30 species of land and fresh-water shells enumerated by C. W. PEACH, J. of Conch. iv. pp. 225-228.

Durham. List of land and fresh-water shells, by B. HAYSON, Naturalist (2) x. p. 112.

Yorkshire. Conchological notes from Hatfield Chase; *op. cit.* ix. pp. 115 & 116. List of 38 fresh-water shells, with some varieties, extracted from the Record of the Conchological Society; J. of Conch. iv. pp. 188-194. *Paludina contecta* in Yorkshire; W. NELSON, *t. c.* p. 214.

Nottinghamshire. Large-sized *Anodonta* and *Unio*; C. T. MASSON, Naturalist (2) x. p. 112, and TAYLOR, J. of Conch. iv. p. 224.

Northamptonshire. 177 land and fresh-water species, from the Records of the Conchological Society; J. of Conch. iv. pp. 247-258. 72 collected at Peterborough by A. W. NICHOLS, *t. c.* pp. 185-188.

Somersetshire. 53 species; J. PONSONBY, *t. c.* pp. 245-247.

Llandudno and *Denbighshire*, in *North Wales*. 35 species; W. D. ROEBUCK, *t. c.* pp. 206-214.

Preston-Candover, North Hampshire. 42 species, by P. FITZGERALD, *t. c.* pp. 203-205.

Helix villosa (Dr.) at Cardiff, new for the United Kingdom; COLLIER, J. of Conch. iv. p. 214.

Helix cantianiformis, supposed sp. n., from Folkestone; ANCEY, Bull. Soc. mal. Fr. i. p. 158.

British localities and new varieties of slugs, by ROEBUCK, J. of Conch. iv. pp. 134, 140, 150, 152, 158, 217, & 222, and Scot. Nat. (2) i. pp. 105 & 106.

Testacella maugei var. *viridans*, Waterford, in Ireland; *id. t. c.* p. 151.

Var. *scutulium* (Sow.), Kew and Welbeck Abbey, Nottinghamshire; R. A. ROLFE, *t. c.* p. 216.

Bulinus acutus var. *elongata*, Isle of Wight; TAYLOR, *t. c.* p. 216.

Pupa secale var. *minor* in Sussex; *id. t. c.* p. 134.

Cyclostoma elegans var. *fasciata* in Kent and Moumouthshire; *id. t. c.* p. 158.

Several varieties of *Limnaea* at Faversham and Malham; *id. t. c.* pp. 134 & 149.

English localities for various land and fresh-water shells, by C. ASHFORD, E. COLLIER, HILL EVANS, BAKER HUDSON, W. JEFFREY, R. M. CHRISTY, E. PICKARD, W. B. WATERFALL, W. BAILLIE, &c., in J. of Conch. iv. pp. 151, 153, 154, 171, 216, & 224.

4. France.

New species of *Helix* and *Hyalina*: ANCEY, Bull. Soc. mal. Fr. i. pp. 157-159; BERENGUIER, *t. c.* p. 285; BERTHIER, pp. 353-354; BOURGUIGNAT, p. 357; FLORENCE, pp. 359-366; LOCARD, Ann. Soc. L. Lyon xxxi. 28 pp.; and FAGOT [title, vide *supra*]. *Helix obvoluta*, *holoserica*, and *desmoulinsi*: occurrence in France; Locard, Bull. Soc. mal. Fr. i. pp. 197 & 207. French species of *Vivipara*; Bourguignat, *t. c.* pp. 183-188, pl. iii. New *Valvata*; Locard, *t. c.* p. 208.

Dep. Oise. A. BAUDON has published a third list of the Mollusks of

this department (the first 1853, the ^{ev} second 1862), enumerating 79 terrestrial and 59 fresh-water species, with several varieties and anomalies. *Helix aspersa*, *carthusiana*, and *Cyclostoma elegans* are common; the genus *Clausilia* is only represented by 4 species, viz., *laminata*, *rolphii*, *nigricans*, and *parvula*; the sub-genus *Torquilla* of *Pupa* not at all; *Paludina* only by one species, *P. vivipara* (*achatina*, Lam.). Of *Unio* we find *sinuatus*, *rhomboideus*, *batavus*, *requienii*, and *tumidus*. J. de Conch. xxxii. pp. 193-325, pls. viii.-x.

Dep. Aube. Two new species of *Bithynia*; J. RAY, Bull. Soc. mal. Fr. i. pp. 155 & 156.

Dep. Nièvre. Four new species of *Anodonta*; PECHAUD, t. c. pp. 189-196.

5. Central Europe.

*W. EBEN publishes a treatise on the *Mollusca* of Belgium.

S. CLESSIN publishes a new edition of his "Deutsche Excursions-Mollusken-Fauna" [see Zool. Rec. xiv. *Moll.* p. 15], describing the land and fresh-water species of the German Empire and Bohemia; special attention is given to the varieties and to the geographical distribution.

N.W. Germany. F. BORCHERDING makes some additions to his former list [Zool. Rec. xx. *Moll.* p. 23], containing chiefly some slugs, *Clausilia biplicata*, and *Margaritana margaritifera*; Abh. Ver. Brem. ix. 2, pp. 141-166, pl. iii. The same enumerates 43 land and 36 fresh-water species found at and near Lüneburg; JH. Ver. Lüneb. ix. pp. 71-100. An anonymous list of 66 terrestrial and 52 fresh-water species found at Hanover, in J.B. Ges. Hannov. Nos. 31 & 32, 1883, pp. 33-43.

Hamburg. Several forms of *Vivipara* distinguished as species by G. SERVAIN, Bull. Soc. mal. Fr. i. pp. 173-182.

Eastern and Western Prussia. Notes on the occurrence of several terrestrial and fresh-water shells, by E. FRIEDEL, Mal. Bl. (2) vii. pp. 49-52, 54, & 57 [see in the special part, *Helix austriaca*].

Helix nemoralis (L.) on the left bank of the Vistula, near Thorn, *austriaca* (Mhlf.) on the right, one excluding the other; Friedel, Mal. Bl. (2) vii. pp. 49 & 50.

Silesia. List of 99 land and 56 fresh-water species, with full historical account of former works in which the *Mollusca* of Silesia are treated; *Helix carthusiana*, cited by Scholtz as Silesian, was probably a whitish variety of *H. carpatica* (Friv.): E. MERKEL, JB. mal. Ges. xi. pp. 263-289. Some additions, including *Hyalina alliaria*, by the same, Nachr. mal. Ges. 1884, pp. 174-178.

A. WEISS treats of the land and fresh-water *Mollusca* of Upper *Posen*; SB. Ges. Isis, 1883, pp. 102-104.

Helix faustina (Ziegl.), near Kösen; Goldfuss, Z. Naturw. lvii. p. 78.

Thuringia. *Clausilia orthostoma* on the Ochsenberg; Strubell, Nachr. mal. Ges. 1884, p. 97.

Rhön (northern borders of Bavaria). Notes on its terrestrial *Mollusca*, by S. CLESSIN, Nachr. mal. Ges. 1884, pp. 186-188.

Schaumburg in Nassau. 40 terrestrial and 1 fresh-water species enumerated by J. BLUM, Nachr. mal. Ges. 1884, pp. 180-182.

The Mollusca of the Grand-Duché of Luxembourg; Jeffreys, *l. c.* pp. 341-372, pls. 1-17. The Mollusca of the Grand-Duché of Luxembourg; Jeffreys, *l. c.* pp. 341-372, pls. 1-17. A popular introduction concerning the Mollusca of the Grand-Duché of Luxembourg; Jeffreys, *l. c.* pp. 341-372, pls. 1-17.

Limax variegatus (Dr.) found in Württemberg; O. KIMMEL, JH. Ver. Württ. xl. p. 326.

Bavaria. O. BACHMANN enumerates 67 land and 32 fresh-water shells observed at Landsberg, on the banks of the Lech, and near the Ammersee [title, vide *suprà*].

Berne. 72 terrestrial and 33 fresh-water species, among which *Arion empiricorum* (Fer.) mostly brown, and *A. hortensis* (Fer.), *Helix sylvatica* (Dr.), *Buliminus detritus* (Müll.), *Clausilia parvula* (Stud.), and *plicatula* (Drap.), are most common, and some notes on the shells of the "Bernese Oberland," by T. STUDER, MT. Ges. Bern, 1884, 18 pp., partly from his own observations, partly from the collections of the late S. Studer, Shuttleworth, and Blauner.

Berne and Interlaken. 53 terrestrial and 22 fresh-water shells enumerated by G. REGELSPERGER. No slugs mentioned. The author distinguishes the fauna of the plains and great valleys (*Zonites glaber*, *cellarius*, *Helix hispida*, *fruticum*, *hortensis*, *nemorialis*, *pomatia*, &c.) ; that of the lower mountains, below 1000 metres (*Vittrina pellucida*, *diaphana*, *Helix obvolvata*, *personata*, *lapicida*, *sylvatica*, *Bulimus montanus*, *Clausilia lamellata*) ; and finally, that of the rocks exposed to the south (*Helix pumilio*, *costata*, *Pupa avenacea*, *muscorum*, *Vertigo pygmaea* and *pusilla*). The higher mountains have not been explored by him. The following fresh-water species have been found by him in the Lake of Thun:—*Limnaea stagnalis*, *auricularia*, *limosa*, *palustris*, *Planorbis carinatus*, *contortus*, *albus*, *Bythinia tentaculata*, *Valvata piscinalis*, *Anodonta unatina*, *Unio crassus*, *Pisidium amnicum* and *casertanum* ; in the Lake of Brienz, only *Limnaea limosa*, *Planorbis carinatus*, *contortus*, and *Ancylus fluviatilis* ; in a small lake near Interlaken, *Anodonta gallica*. MT. Ges. Bern, 1883, pp. 31-42 ; also separately [title, vide *suprà*].

Cottian Alps, from Grenoble to Susa. 29 terrestrial shells collected by H. SIMON, determined by O. BÖTTGER, among which *Helix glacialis* at Mont Cenis and Monte Viso, *H. alpina* (Fer.) var. at Col du Lantaret, and only 2 species of *Clausilia* ; Nachr. mal. Ges. 1884, pp. 33-49. Earlier observations concerning the same country, by the same ; Ber. offenb. Ver. xxii. & xxiii. pp. 157-161.

Styria. *Clausilia dubia* var. *schlechtii* (Zeleb.) common on the Semmering ; *Pomatias septemspirale*, localities in Upper Styria, and a new variety of *Limnaea palustris* : Tschapeck, Nachr. mal. Ges. 1884, pp. 17-21.

Carinthia and Curniolia. 58 terrestrial and 5 fresh-water species from the environs of Tarvis and Kronau, among which are 16 species of *Clausilia*, by J. STUSSINER & O. BÖTTGER, Nachr. mal. Ges. 1884, pp. 1-184, & 185.

6. Southern Europe and Shores of the Mediterranean. 7

Spain. G. HIDALGO continues his work on the terrestrial shells of Spain [title, vide *suprà*], treating the genera *Parmacella* and *Helix* in

Sicil. iii. pp. 102-111 (some new names), species of *Helix*, by ANCEY, Nat. tioned in the preceding Record, p. 8.

Valvata Rissoidae, t. c. pp. 137-14 57 terrestrial species, among which are *Helix villosa*, and subgen~~er~~^{us} *ericeorum*, *striata* (Müll.), *caperata*, *apicina*, *conspurcata*, *lactea*, *punctata* (Müll.), *vermiculata*, *nemoralis* and *hortensis*, *splendida*, *limbata*, *laticida*, *Bulimus quadridens*, *decollatus*, *acutus*, *ventrosus*, *Azeca tridens*, *Pupa dolium*, *polyodon*, *secale*, *granum*, *Clausilia dubia*, *rugosa*, and *solida*, and only 6 fresh-water species, *Physa acuta*, *fontinalis*, *Limnaea truncatula*, *limosa*, *peregra*, and *Ancylus fluviatilis*, enumerated by J. SALVANA [title, vide *suprà*].

Mirando de Ebro. Note by BOURGUIGNAT, An. Soc. Esp. xiii. 1, pp. 126 & 127.

Majorca and Minorca. New species of *Helix*; ANCEY, Bull. Soc. mal. Fr. i. pp. 161 & 163.

Gibraltar. 10 terrestrial species added to Kobelt's list [Zool. Rec. xx. Moll. p. 25], by J. PONSONBY, Nachr. mal. Ges. 1884, pp. 107 & 108. 24 known terrestrial species enumerated from the collections made by A. MORELET, W. KOBELT, J. PONSONBY, G. DANTEZ, and P. HESSE, by H. CROSSE, J. de Conch. xxxii. pp. 105-112. Slugs from Gibraltar and Tangiers; P. HESSE, Mal. Bl. (2) vii. pp. 9-17.

Berlingas Islands, coast of Portugal. 6 species of land shells, all known from the mainland; FISCHER, J. de Conch. xxxii. p. 378.

Italy. The species allied to *Helix striata* (Drap.) and *spadæ* (Calcare) reviewed, and many new names introduced, by FAGOT, Bull. Soc. mal. Fr. i. pp. 107-131. Critical review of the Italian species of *Paludina*, from studies in the collection of Signora Marchese Paulucci, by C. CAROTI, Bull. Soc. mal. Ital. ix. pp. 266-293. List of Italian *Anodonta*, by BOURGUIGNAT, Nat. Sicil. iii. 1882, pp. 20-24.

Apuan Mountains, Tuscany. C. DE STEFANI continues his treatise on the *Mollusca* of this region, describing several species and varieties of *Hydrobia* and of *Pisidium*, and adding general considerations on the whole fauna; Bull. Soc. mal. Ital. ix. pp. 193-253.

Sardinia. Note concerning earlier collections of land shells made in that island, and especially on the last, by FORSYTH MAJOR, adding several species (2 new), to these enumerated by Mad. Paulucci [Zool. Rec. xix. Moll. p. 9], by E. v. MARTENS, SB. nat. Fr. 1884, pp. 195-197.

Sicily. Notes on its terrestrial shells, with some new species, by C. CAFICI, Nat. Sicil. ii. 1882, pp. 1-6, 29-33, & 49-52, pl. i., and Bull. Soc. mal. Fr. i. pp. 305-309. Some new fresh-water shells; *id. op. cit.* iii. pp. 215 & 216. The species of slugs known from Sicily enumerated, abstracted from LESSONA and POLLONERA [Zool. Rec. xix. Moll. p. 22], by M. PALUMBO, *op. cit.* ii. 1883, pp. 110-115.

Malta. 6 fresh-water, 30 terrestrial, and 1 submarine species, enumerated by E. F. BECHER, among which may be mentioned here, *Pisidium pusillum*, *Paludina melitensis* (Benoit), [*Hydrobia*], *Physa melitensis* (Mamo), *Limnaea truncatula*, *Ancylus fluviatilis*, *Helix schembrii* (Scacchi), *spratti* (Pfr.), *meda* (Porro), *candidissima* (Drap.), *erdellii* (Roth.), *Clausilia scalaris* (Pfr.), *mamotica* (Gulia), *Pupa granum* and *avenacea*. The

author refers to a little-known paper by GIUSEPPE MAMO, 1867. J. of Conch. ¹² *Acridæ*, 51 *Pyramidellidæ*, and 17 *Unionidæ*; Jeffreys, t. c. pp. 341-372, pls.

Dalmatia. On the localities of some of the French [part].

Servia. The known *Unionidæ*, 22 species of the *Unionidæ*, 4 among which are new, 7 figured, and 10 of *Anodonta*, *U. savensis*, *pancici*, and *bosnensis*, *Anodonta savensis*, *mæsica*, and *complanata* being the prevailing and characteristic forms; H. DROUET, Suppl. aux *Unionidæ* de la Serbie, 1884, 16 pp., 2 pls. A paper by DOKIC, in Belgrade, "Mollusques lamellibranches de la Serbie" (Belgrade: 1882), and another of more general contents, "Tableau analytique et systematique des animaux vivants de la Serbie, 1883," have not been seen by the Recorder.

Transsylvania. M. v. KIMAKOWICZ continues his list of Transylvanian *Mollusca* [Zool. Rec. xx. *Moll.* p. 25], treating of the *Succineæ* and the fresh-water species, and giving some additions to the former part; Verh. siebenb. Ver. xxxiv.

Thessalia. New *Campylæa*; THIESSE, Bull. Soc. mal. Fr. i. p. 271.

Santorin. 20 terrestrial species, among which 9 regarded as new, collected by A. LETOURNEUX, Bull. Soc. mal. Fr. i. pp. 287-304.

Crete and Rhodes. Critical notes on some species of *Helix* and *Clausilia*, by H. v. MALTZAN, Nachr. mal. Ges. 1884, pp. 73-75.

Asia Minor, N. coast. Several new species of *Brephulus*; Galland, Bull. Soc. mal. Fr. i. pp. 272-284.

Abchasia, Caucasus. 44 species of terrestrial and 2 of fresh-water *Mollusca*, 4 of the former new, collected by O. RETOWSKI, determined by O. BÜTTGER; Ber. senck. Ges. 1884, pp. 146-155.

Algeria. Account of malacological excursions by W. KOBELT, Nachr. mal. Ges. 1884, pp. 121-168, and by J. PECHAUD, from La Calle to Algiers and Tangiers, in a * separate pamphlet. Some new species of *Helix*; ANCEY, Bull. Soc. mal. Fr. i. pp. 160-172, and Nat. Sicil. i. pp. 285-295. Species of *Clausilia* and *Valvata*, by HAGENMÜLLER, Bull. Soc. mal. Fr. i. pp. 209-216. [See also Gibraltar, p. 25.]

Egypt. 37 species of *Planorbis*, among which 18 new, and 12 of *Valvata*, among which 5 new, enumerated by W. INNES, Bull. Soc. mal. Fr. i. pp. 329-352.

Mesopotamia. New genus, *Sesteria*; Bourguignat, Bull. Soc. mal. Fr. i. p. 136, pl. iii.

7. Africa.

Abyssinia. New terrestrial species, by W. INNES, Bull. Soc. mal. Fr. i. pp. 103-106.

Socotra. H. CROSSE enumerates its land and fresh-water shells from the papers of GODWIN-AUSTEN and v. MARTENS [Zool. Rec. xx. *Moll.* n. 28], adding some valuable notes on them, and a list of the terrestrial shells of the neighbouring island of Abd-el-Goury, from the collection made by GUILLAIN in 1848; J. de Conch. xxxii. pp. 341-375.

Canary Islands. 14 known species of land shells collected during the 'Challenger' Expedition; E. A. Smith, P. Z. S. 1884, p. 276.

Cape Verde Islands. On the island Branco, the home of the large

Sicil. iii. pp. 102-111 (some new name-terrestrial shells have been found tioned in the preceding Record, p. 5, ' *Buliminus subdiaphanus* (King) a. the *Rissoide*, t. c. pp. 137-141g also on other islands of the same group; Fischer, 3. and subgen xxxii. pp. 379-381.

Niger. A new species of *Unio*; WATTELED, J. de Conch. xxxii. p. 132, pl. vii. fig. 1.

Island St. Thomas, Gulf of Guinea. GREEFF recapitulates his notes on its terrestrial *Mollusca* [see Zool Rec. xix. *Moll.* p. 23], and insists on the specific distinctness of some of them, in SB. Ges. Marb. No. 2, pp. 51 & 52.

Madagascar. 14 new species of *Helix*; Mabille, Bull. Soc. mal. Fr. i. pp. 139-153.

8. Central and Eastern Asia.

Central China and Thibet. The terrestrial shells collected by A. DAVID in Moupin and Shensi, enumerated by F. ANCEY, Nat. Sicil. ii. 1883, pp. 141-144, 163-168, 209-211, & 266-270. The same describes several species of *Helix* and *Bulimus* [*Buliminus*] collected by DESGODINS & BIET between Bathang, Yerkalo, and Tsekou, most of them new: Ann. mal. i. pp. 381-397.

China. O. v. MÖLLENDORFF enumerates the known species of *Helix* and *Patula*, with synonymy and critical notes concerning the localities and systematic position, and adds some new, making up their number to 122; JB. mal. Ges. xi. pp. 307-390, pls. vii.-ix. The same on the genera *Amphidromus*, which is found only on Formosa, *Buliminus*, and *Pupa*; t. c. pp. 162-181. Some critical notes concerning the names and distinctness of a few species by the same; Nachr. mal. Ges. 1884, pp. 103-106. Also M. HEUDE proposes new names for some species, which he had described in his former works, but the names of which are preoccupied; J. de Conch. xxxii. pp. 19 & 20.

V. GREDLER publishes some critical remarks on Heude's work [see Zool. Rec. xix. *Moll.* pp. 6 & 25], describes several new species collected by K. FUCHS and his pupils in the provinces Kuangsi and Hunan, and gives some new localities, and additions to the descriptions of others; JB. mal. Ges. xi. pp. 129-161, pl. iii.

Provinces Hunan, Hupe, and Schensi. New or little-known terrestrial and fresh-water shells, collected by K. & L. FUCHS, determined by V. GREDLER, Arch. f. Nat. l. pp. 257-280, pl. xix.

Hainan, Formosa, and some other parts of the Continent of Southern China. New terrestrial species by O. v. MÖLLENDORFF, Nachr. mal. Ges. 1884, pp. 169-174.

9. Southern Asia.

Cochin China. Some new species from Long-Xuyen, by G. WATTELED, J. de Conch. xxxii. pp. 125-131, pl. vi.

Cambodia. Several new terrestrial and fresh-water species collected by M. PAVIÉ, described by L. MORLET, J. de Conch. xxxii. pp. 386-403, pls. xi.-xiii.

Siam and Cambodia. Some land, 2 new genera; ROCHERBONE, *Burm. Ocean.* 102-118.

British India. H. H. GODWIN-AUSTIN, *Ancillaria, Cypræa*, &c. the 5th part of his *Land and Fresh-water Moll. of India*, pls. xliii.-li., many species of *Alycaeus*, *Diplommantina*, and *Raphaulus*. The letterpress will be published next year.

10. *Malayan Archipelago and Papua.*

South-Eastern Borneo. Note on some land and fresh-water shells collected by GRABOWSKI, 1 new, by E. v. MARTENS, *SB. nat. Fr.* 1884, pp. 198 & 199.

Amboina, Aru Islands, and Philippines. Land and fresh-water shells from the 'Challenger' Expedition, enumerated by E. A. SMITH, *P. Z. S.* 1884, pp. 259-262.

Philippines. New *Cyclophoridae* from C. SEMPER's collection, by W. KOBELT, *Nachr. mal. Ges.* 1884, pp. 49-52.

New Guinea. Synonymy and emendation of locality of some species of *Helix*; BRAZIER, *P. Linn. Soc. N. S. W.* ix. pp. 804-806.

Admiralty Islands, Api Island (New Hebrides), and Fiji Islands. Land and fresh-water shells collected during the 'Challenger' Expedition, enumerated by E. A. SMITH, several new; *P. Z. S.* 1884, pp. 263-271.

11. *Australia.*

Australia. A new genus, *Parmacochlea*, from Cape York, and some species from Sydney, collected during the 'Challenger' Expedition; E. A. SMITH, *P. Z. S.* 1884, pp. 272-274.

New South Wales. Some new fresh-water shells by W. F. PETTERD, *J. of Conch.* iv. pp. 159 & 160.

New Zealand. F. W. HUTTON gives a critical list of all the terrestrial New Zealand *Mollusca*, with several new genera, with short descriptions, *Tr. N. Z. Inst.* xvi. pp. 186-212; and descriptions of radulae of many species, *t. c.* pp. 161-174, pls. ix.-xi.; shells of new species, pp. 174-184. 2 new species of *Unio*, *id. t. c.* p. 216. Several new *Limnæida*, *id.* *N. Z. J. Sci.* ii. p. 175. 2 new species of land shells by E. A. SMITH, *P. Z. S.* 1884, pp. 272 & 273.

12. *North America.*

Anticosti, Gulf of St. Lawrence. 17 terrestrial and 8 fresh-water species, among which 10 European, collected by Prof. MASON, and enumerated by F. R. LATCHFORD, *Am. Nat.* xviii. p. 1052.

Behring Island. *Limax hyperboreus* (West.), *Vitrina exilis* (Mor.), *Hyalina radiatula* (Ald.), *Conulus pupula* (Gould), *Patula floccula* (Mor.), *Pupilla decora* (Gould), *Limnea ovata* (Drap.) and *humilis* (Say), and *Pisidium aquilaterale* (Prime), collected by L. STEINER, enumerated by W. H. DALL, *P. U. S. Nat. Mus.* vii. pp. 341, 343, & 348.

varieties critically enumerated by the ^{ies} of *Sphaerium* and *Pisidium* in list of New Zealand *Patellidae* with ⁵ U. S. Nat. Mus. vii. pp. 102 & 103. gives a revised list of

13. West Indies.

Cuba. A new *Chendropoma* and 6 new species of *Cylindrella*; ARANGO, P. Ac. Philad. 1884, ii. pp. 211 & 212, woodcuts.

Porto Rico. A list of sea shells, determined by the late W. Dunker and by the Recorder, published by J. GUNDLACH, An. Soc. Esp. xii. pp. 441-484.

St. Thomas. 4 terrestrial and 2 fresh-water shells collected during the 'Challenger' Expedition; E. A. SMITH, P. Z. S. 1884, p. 277.

Dominica. 16 non-operculated and 4 operculated terrestrial species collected and enumerated by G. F. ANGAS, P. Z. S. 1883, pp. 594-597; among them 3 species of *Succinea*, 1 *Amphibulima*, 4 *Bulimus* [*Bulinulus*], and 4 *Helix* subg. *Dentellaria*.

14. Central and South America.

Costa Rica. New species of *Sphaerium*; T. PRIME, P. U. S. Nat. Mus. vii. p. 102.

Juan Fernandez. 10 terrestrial species, 1 new, collected during the 'Challenger' Expedition; E. A. SMITH, P. Z. S. 1884, pp. 279-281.

15. Antarctic Islands.

Falkland Islands. A new species of *Succinea* and *Chilina patagonica* (Sow.); *id. t. c.* pp. 280 & 281.

Tristan d'Acunha. *Limax canariensis* (Orb.) and *gagates* (Dr.), *Hyalinia exulata*, sp. n., and 2 species of *Balea*; *id. t. c.* pp. 278 & 279.

Prince Edward's Island. *Helix hookeri* (Reeve) var.; *id. t. c.* p. 277.

b. MARINE MOLLUSCA.

1. Deep Sea Researches.

NORMAN's address to the meeting of the Tyneside Naturalist's Field Club, 1881, concerning the deep-sea fauna of the North Atlantic, is translated in *Nachr. mal. Ges.* 1884, pp. 75-81.

P. FISCHER's paper on intertropical deep-sea *Mollusca* [*Zool. Rec.* xx. Moll. p. 31] abstracted in J. R. Micr. Soc. (2) iv. p. 206.

The late J. GWYN JEFFREYS enumerates 42 species of *Rissoa*, including *Alvania*, *Onoba*, and *Cingula*, 2 *Hydrobia*, 1 *Bithynia*, 1 *Barleeia*, 1 *Hemalogyra*, 1 *Siliquaria*, 1 *Stilbe*, g. n., 2 *Turritella*, 1 *Mesalia*, 21 *Scalaria*, and 1 *Acirsa*, several of which new, procured during the 'Lightning' and 'Porcupine' Expeditions in the Mediterranean and Atlantic, and gives a supplement to his former lists on this subject, including also the shells found on the French expedition of the 'Talisman'; P. Z. S. 1884,

pp. 111-149, pls. ix. & x. 4 spp.
Eulimidae, from the same expedition *Ocean*.
 xxvi.-xxviii.

A few notes on the *Mollusca* dredged by the expedition of the 'Talisman' in the Sargasso Sea, by A. MILNE-EDWARDS, in his preliminary report in the *Bull. hebdom. de l'Ass. scient. de la France*, Dec. 23, 1883; separately published, 1884, 8vo, p. 27. *Mollusca* of the gulf-weed; *op. cit.* p. 25.

24 species of *Nudibranchiata* collected by H.M.S. 'Challenger' described, with numerous anatomical notes, by R. BERGH; only one abyssal, *Bathydoris*, g. n. [vide *infra*]: *Zool. Challeng.* x. *Nudibr.* 154 pp., 14 pls.

2. Seas of Northern Europe.

JEFFREYS gives a list of 35 North American deep-sea species, identifying 30 of them with European ones, and comes to the conclusion that the deep-sea *Mollusca* have a much wider geographical range than the littoral; *Rep. Brit. Ass.* 1884, pp. 553 & 554.

The sea-shells on the coast of Yorkshire enumerated by W. G. HEY, *Naturalist* (2) x. pp. 25-31.

Ilfracombe. 72 species enumerated by J. W. CUNDALL, *J. of Conch.* iv. pp. 147-149.

Scheldt. 24 species of *Mollusca*, by M. SCHEPMAN, *Tijdschr. Nederl. Dierk. Ver.*, Suppl. D, pp. 503-515.

Jutland. 159 species found in the south-eastern part of the German Ocean, on the coast of Jutland, and 172 from the Cattegat, enumerated by J. COLLIN, *Limfjorden's Mar. Fauna*, pp. 145-160.

Baltic. *Mytilus edulis*, *Cardium edule*, *Tellina baltica*, *Mya arenaria*, *Littorina rudis*, and *Hydrobia baltica* are the only true marine shells found in the Finnish inlet between Dragö and Papenwick, besides several fresh-water shells of the genera *Unio*, *Cyclas*, *Neritina*, *Linnaea*, and *Bithynia*; M. Braun, *Arch. Nat. Liv.* (2) x. pp. 102-107, 112, & 113. The marine shells and *Neritina fluviatilis* to depths of 15-20 fath., the others only ½-3 fath.; *t. c.* p. 118. On the shells found on the beach in Eastern Prussia; E. FRIEDEL, *Mal. Bl.* (2) vii. pp. 51-56.

3. Coast of Portugal.

Berlingas Islands, Coast of Portugal. 6 species of sea shells, all Mediterranean; northernmost locality of *Siphonaria algesivæ* (Q. G.) and *Argonauta argo* (L.); FISCHER, *J. de Conch.* xxxii. pp. 375-377.

Portugal. *Panopæa aldrovandi* and *Cymbium papillarum* [olla, L.] at the mouth of the Tagus; *Argonauta argo* north of Lisbon: CHOFFET, *Nachr. mal. Ges.* 1884, p. 188 (abstract from *Le Nat.*).

4. Mediterranean.

MONTEROSATO continues to enumerate the littoral shells of the Mediterranean; he treats of the *Patellidae*, *Fissurellidae*, and *Trochidae*, *Nat.*

varieties critically enumerated by the ²es here proposed are already mentioned in the list of New Zealand *Patellidae* with ²0, 159-163, 227-231, & 277-281, with many new genera ²era; *Jeffreysia*, *Truncatella*, *Skenea*, and allied genera, further the *Cæcidae*, *op. cit.* iv. pp. 21-24; the *Vermetidae*, *t. c.* pp. 60-63. These lists contain several new species, much valuable information concerning the synonymy, and a rather large number of new subgenera and genera characterized only by the shells.

A. DE GREGORIO reviews several genera and many species of Mediterranean shells, distinguishing many new varieties by rather strange names, and comparing them with postpliocene, pliocene, and even miocene forms from Italy, Austria, and France, for example *Ostrea*, *Murex*, &c.; he describes also several new species and even subgenera and genera found in sponges which are said to come from the coast of N. Africa, but this appears somewhat doubtful. *Bull. Soc. mal. Ital.* x. pp. 36-288.

W. KOBELT continues his work on the marine shell-bearing *Mollusca* of Europe, treating in pts. 2 & 3 the rest of *Murex*, *Typhis*, *Trophon* (8 species), *Meyeria*, *Purpura*, *Coralliophila* (5 species), *Fusus* (7 species), *Troschelia*, and 17 species of *Neptunea*, with very good figures [title, *vide supra*].

R. DEL-PRETE enumerates 46 species obtained from coral-fishers at Sciacca, Sicily, which are not mentioned in Monterosato's list from that place; *Bull. Soc. mal. Ital.* ix. pp. 254-265.

The *Cephalopoda* of the Adriatic are enumerated by A. P. NINNI in a separate pamphlet [title, *vide supra*], with 1 pl.

Some Nudibranchs from Naples and Trieste, several new, described by R. BERGH, in Semper's *Reis. Arch. Phil.* ii. 2, pt. 15.

ROCHEBRUNE on *Cypræa moneta* and *annulus*; *Bull. Soc. mal. Fr.* i. pp. 96 & 97 [*vide infra*].

5. East Coast of North America.

Newfoundland. A new *Buccinum* and some other species; VERKRÜZEN, *Nachr. mal. Ges.* 1884, pp. 98-103.

A. E. VERRILL gives a second list of 66 deep-sea *Mollusca* added to the fauna of the New England coast; *Tr. Conn. Ac.* vi. pt. 1, pp. 139-294, 5 pls. There are several new genera of Cephalopods.

6. Tropical Atlantic.

Cape Verde Islands. 22 species of marine Gastropods and 10 Bivalves, collected by C. DOELTER, determined and compared with tertiary European species by L. TAUSCH, *J.B. mal. Ges.* xi. pp. 181-188.

ROCHEBRUNE on the occurrence of *Monetaria* on the N.W. coast of Africa, by ROCHEBRUNE [*vide infra* : *Cypræidae*].

Senegambia. 22 new marine species or varieties, by H. v. MALTZAN, *Nachr. mal. Ges.* 1884, pp. 65-73.

New and little-known Cephalopods from the West Indies; VERRILL, *Bull. Mus. C. Z.* xi. No. 5, pp. 105-114, pls. i.-iii.

7. *India Ocean.*

Red Sea. The known species of *Ancillaria*, *Cypræa*, and *Pleurotoma* enumerated, partly from his own collections, by C. F. JICKELI, JB. mal. Ges. xi. pp. 189-217. 22 species of *Pyramidellidæ* and 20 of the genus *Rissoina*, by the same, t. c. pp. 245-263; three of the latter figured, pl. vi.

Amirantes, Seychelles, and Mascarenes. 101 species of Gastropods, 20 of Bivalves, collected by R. COPPINGER, enumerated by E. A. SMITH, Zool. Coll. Alert, pp. 487-508, pl. xlv.

N.W. Coast of Australia. 50 species of marine shells, collected at Dampier's Land Peninsula, enumerated by J. BRAZIER, P. Linn. Soc. N. S. W. ix. pp. 793-803.

3 *Cephalopoda*, 137 *Gastropoda*, and 77 *Bivalves* from Arafura Sea, Torres Straits, and Queensland, some new, with numerous critical remarks, enumerated by E. A. SMITH, Zool. Coll. Alert, pp. 34-116, pls. iv.-vii.

New Caledonia. 19 species of *Triforis*, most of them new; JOUSSEAUME, Bull. Soc. mal. Fr. i. pp. 269 & 270.

8. *Northern Pacific.*

Behring Sea, Avatcha, Petropaulowsk, and Behring Island. 2 species of Cephalopods, 2 Nudibranchiata, 4 Chitonids, 17 other marine Gastropods, and 13 Bivalves: 22 species of them are Arctic, all of which occur on the Aleutian Islands, 14 found in Northern Japan, 13 in California, 2 peculiar. W. H. DALL, P. U. S. Nat. Mus. vii. pp. 340-349. [Among the 13 Bivalves, 7 are also found on the Arctic shores of Europe; among the 23 Gastropods, only 5.]

9. *Australian Seas.*

Tasmania. 37 new species described by W. F. PETTERD, J. of Conch. iv. pp. 135-145.

New Zealand. F. W. HUTTON gives a critical review of the known Rhachiglossate sea shells of New Zealand, with synonymy and short descriptions, enumerating 9 *Muricina*, 6 *Purpurina*, 1 *Ancillaria*, 1 *Columbella*, 2 species of *Marginella*, 3 of *Voluta*, 1 *Turricula*, 3 *Fusidæ*, 18 *Buccinidæ*, and 1 *Nassa*, in all 45 species, and eliminating several species which had been wrongly credited to New Zealand; Tr. N. Z. Inst. xvi. pp. 216-233. 6 species of *Tritonidæ*, 3 *Doliidæ*, 2 *Lamelliariidæ*, 2 *Naticidæ*, 3 *Turbonillidæ*, 1 *Pyramidellidæ*, 2 *Cypræidæ*, among which *Trivia europæa* (Mont.), 1 *Cancellariidæ*, 1 *Trichotropidæ*, 8 *Cerithiæ*, 2 *Struthiolariidæ*, 6 *Calyptræidæ*, 7 *Turritellidæ*, 9 *Rissoidæ*, 3 *Litorinidæ*, 4 *Vermetidæ*, 3 *Scalaridæ*, 1 *Onustidæ*, 1 *Solaridæ*, and 3 *Ianthinidæ*, from New Zealand, enumerated; id. P. Linn. Soc. N. S. W. ix. pp. 932-944. 1 sp. of *Neritidæ*, 40 of *Trochidæ*, 2 *Pleurotomariidæ*, 3 *Haliotidæ*, 6 *Fissurellidæ*, 7 *Acmaidæ*, and 11 *Patellidæ*, with several

varieties critically enumerated by the same, *t. c.* pp. 354-378. Critical list of New Zealand *Patellidae* with synoptical table; *id. t. c.* pp. 374-378.

The same gives a revised list of the New Zealand Bivalves, containing 108 species, with synonymy and critical notes, and indicates a number of other species which have been wrongly attributed to New Zealand; *t. c.* pp. 512-533.

Some species of New Zealand shells by the same; *Tr. N. Z. Inst.* xvi. pp. 212-216.

PALEONTOLOGY OF RECENT MOLLUSKS.

We may mention that two important manuals concerning the fossil *Mollusca* have appeared in this year—R. HÖRNES' *Elemente der Paläontologie* (Leipzig: 1884, 8vo), *Mollusca*, pp. 208-337, with many woodcuts, chiefly of Austrian species; and K. A. ZITTEL's *Handbuch der Paläontologie* (München und Leipzig, 8vo), still in progress, the *Mollusca* in vol. i., second division, pts. 2-3, 1884, pp. 1-140, also with many woodcuts.

The first occurrence of terrestrial *Mollusca* in the carboniferous beds of N. America is corroborated by the discovery of two fresh water shells, *Physa prisca* and *Ampullaria ? powelli*, and of a new genus, *Zptychius*, belonging probably to the *Auriculidae*, in the Lower Carboniferous beds of Nevada: C. WALCOTT, in *Science*, ii. p. 808 (abstract in *Nachr. mal. Ges.* 1884, pp. 61 & 62, with woodcuts).

JEFFREYS has examined the original shells of Brocchi's *Conchiologia Fossile Subappennina*, and gives some notes concerning their synonymy; *J. G. Soc.* Febr. 1884.

J. DEFONTAILLIER treats of the Pliocene species of *Murex* of the environs of Cannes, 31 species, among which 8 are still living in the Mediterranean, and others nearly allied to them; *J. de Conch.* xxxii. pp. 26-76.

The Pliocene land and fresh-water *Mollusca* of Italy are treated of by C. DE STEFANI in *Atti Soc. Tosc.* iii. & v. 196 pp., 3 pls. The following species from among them are still living in Italy:—*Valvata piscinalis* (Müll.), *Peringia ulvae* (Penn.), *Bythinia tentaculata* (L.), *Truncatella truncatula* (Dr.), *Planorbis complanatus* (L.), *Alexia myosotis* (Drap.), *Helix obvolata* (Müll.), *Hyalinia hiulca* (Jan.), *obscurata* (Porro), *olivetorum* (Gm.), and *Succinea putris* (L.). The presence of *Dreissenia* and *Melania*, the more general range of *Melanopsis*, the greater number of *Auriculida* (genera *Ophicardelus* and *Cassidula*), and the relatively small number of land shells (*Clausilia* 1, *Helix* 10 species) are to be noted.

E. FRIEDEL states that no Mollusks are to be found within amber, and ascribes this to the circumstance that the woods of that period consisted only of firs and oaks; *Mal. Bl.* (2) vii. pp. 57-60. S. CLESSIN states that he has seen a specimen of *Helix lamellata* in amber; *t. c.* p. 59, f.n.

List of the Post-tertiary shells from the Basement Clay at Bridlington Quay; Jeffreys, *J. G. Soc.* xi. pp. 319-322 (83 species enumerated, 5 new described and figured).

On subfossil shell deposits in Nottinghamshire containing recent British species; C. T. MUSSON, *J. of Conch.* iv. pp. 161-163.

Diluvial marine shells from Eastern Pomerania; FRIEDEL, Nachr. mal. Ges. 1884, pp. 22-25.

List of Quaternary shells found at Rizzolo, Prov. of Syracuse, Sicily; G. SEGUENZA, Nat. Sicil. ii. pp. 88-90 & 100-104.

A. KRAUSE has found 8 species of shells in Quaternary beds at Behring Straits, all recent Arctic; SB. nat. Fr. 1884, pp. 14 & 15.

38 recent species of marine shells from layers of clay on the MacLay Coast, New Guinea, enumerated by J. BRAZIER, P. Linn. Soc. N. S. W. ix. pp. 988-992.

Vulvata macrostoma in diluvial beds in Moravia; Verh. Geol. Reichsant. 1884, No. 5, p. 75.

HISTORICAL CHANGES AND ACCLIMATISATION.

J. COLLIN publishes his researches concerning the fauna of the Limfjord in Jutland, which was formerly nearly fresh-water, and opened only into the Cattegat, but was changed into salt-water in 1825 by the destruction of the barrier which formerly separated it from the German Ocean; 83 species of marine *Mollusca* are now found in it. The upraised banks of the Fjord contain also beds of shells, which represent its fauna before the irruption of the sea, and here the author could find only 56 species, all of which are also found living in the Cattegat, but 23 of them are not now to be found living in the Limfjord. The surplus of living species appears thereby to be due to the immigration from the west coast since the irruption; they are:—*Loligo breviceps* and *media*, *Lamellidoris proxima*, *Polycera lessoni*, *Æolis glauca*, *Matharena oxyacantha*, *Tectura testudinalis*, *Chiton marginatus* and *marmoreus*, *Teredo norvegica*, *Mactra solida*, *Solen pellucidus*, *Tellina fabula* and *pusilla*, *Cardium fasciatum*, *Nucula nucleus*, *sulcata*, and *nitida*, *Modiolaria discors* and *marmorata*, and *Anomia squamula*. The author enumerates further 74 species which may be expected to immigrate into the fjord in future. Om Limfjorden's marine Fauna, 169 pp.

Helix carthaginiensis found alive on the moor at Cardiff, and *lactea* introduced with ballast; WOTTON, J. of Conch. iv. p. 151. Also *Helix villosa* probably casually introduced there; E. COLLIER, t. c. p. 214.

Planorbis dilatatus (Gould) still lives at Gorton, where it was found by T. Rogers fourteen years ago; *id.* t. c. p. 217.

W. BAILLIE has tried to acclimatise some land shells in East Sutherlandshire, and T. D. A. COCKERELL others at Chiselmhurst; J. of Conch. iv. pp. 160 & 238.

Successful acclimatisation of *Helix silvatica* and *Cyclostoma elegans*, unsuccessful of *Buliminus detritus* and *Pomatias septemspiralis* at Landberg-a.-L., in Bavaria; BACHMANN, Moll. v. Landsb. pp. 15, 18, & 26.

Helix aspersa (Müll.) acclimatised at Berne since the beginning of the century; STUDER, MT. Ges. Bern, 1884, p. 10. *H. aspersa* (Müll.) from Ireland, transferred to Wood's Holl, Massachusetts, Aug. 1883, by E. A. ANDREWS & B. F. KOONS, Bull. U. S. Fish. Comm. iv. p. 87. *H. aspersa* in Tasmania; PETTERD, J. of Conch. iv. p. 133.

Helix aspersa and *hortensis* (Müll.), *Zonites cellarius* (Müll.), *Arion*

fuscus (Müll.), *Limax maximus*, *flavus*, and *agrestis* (L.), introduced into New Zealand; HUTTON, Tr. N. Z. Inst. xvi. pp. 211 & 212.

Limax gagates (Drap.) and *Helix aspersa* (Müll.) acclimatised in S. Africa; E. A. SMITH, P. Z. S. 1884, p. 276. The former also acclimatised at the Bermudas and Tristan d'Acunha; *id. t. c.* pp. 276 & 278.

USE BY MAN.

A. T. DE ROCHEBRUNE has published a second part of his work, "De l'emploi des Mollusques chez les peuples anciens et modernes" [see Zool. Rec. xx. *Moll.* p. 37]. The same on the use of *Cypræa annulus* and *moneta* as ornaments and money by different nations; Bull. Soc. mal. Fr. i. pp. 99-101.

Oliva caldania (Duclos) and a similar species used as ornaments by the natives of New Guinea and the Polynesians, the shell being placed on red-hot ashes to render it entirely white; BRAZIER, P. Linn. Soc. N. S. W. ix. p. 795.

A. LOCARD treats of the employment of shells and other parts of the *Mollusca* in prehistoric and in the older historic times as food, as ornaments, and for other purposes. The tsjanko of the Hindoos, *Turbinella turris*, is the subject of a separate former publication of the same author, the contents of which are reproduced in the later more general book. [Both titles, vide *suprà*.]

Notes on the fishery of shells in North America by W. KOBELT, in "Humboldt," 1884, pp. 440-443.

Note on the pearl fishery in California, in "Neue Pfade in fernen Westen," Kansas; abstract in Nachr. mal. Ges. 1884, p. 189.

Note on the pearl fishery on the Aru Islands, by ROSENBERG, Der malayische Archipel, p. 343; abstract in Nachr. mal. Ges. 1884, p. 29.

Note concerning the culture of land snails in Europe, and advice to try it in N. America, by R. HENSEL, Bull. U. S. Fish Comm. iv. p. 166.

Advice for transportation of clams and oysters, by E. C. STEARNS, Bull. U. S. Fish. Comm. iv. pp. 219 & 220.

Account of a newly-discovered shell heap at Ipswich, Massachusetts, containing *Venus mercenaria*, *Ostrea edulis*, *Helix albolabris* and *alternata*, &c., by J. ROBINSON, Bull. Essex Inst. xiv. pp. 158-162.

RULES FOR SYSTEMATIC CLASSIFICATION AND NOMENCLATURE.

A. LOCARD treats somewhat diffusely on the characters of the species in the *Mollusca*, and on the best method of distinguishing and describing them; he defends the multiplication of species in which the "new French school" indulges, and judges that figures can be dispensed with in many cases: Bull. Soc. mal. Fr. i. pp. 17-72. [The last sentence will probably be agreed to only by few practical conchologists.—REC.]

P. FAGOT protests against the principle that we should prefer names of species which had been too vaguely described and badly figured, on

account of their priority over those by which the species was clearly described and figured; for example, *H. lineata* (Oliv.) to *maritima* (Drap.), *Pupa quinquedentata* (Born) to *similis* (Brug.) or *cinerea* (Drap.): Bull. Soc. mal. Fr. i. pp. 367-374.

A. DE GREGORIO pleads for keeping the names of species given by Linné, even if they are identical with that of the genus in which they are now placed, e.g., *Vulsella vulsella* (L. sp.), *Lima lima* (L. sp.), *Triton tritonis* (L. sp.), &c.; Bull. Soc. mal. Ital. x. pp. 33-35.

CEPHALOPODA.

Some general considerations concerning the mutual affinity of the genera, the place of the hectocotyized arm being of no value for the classification, and the existence of parallel series of generic modifications both in the *Decapoda* and *Octopoda*, urged by J. BROCK, Z. wiss. Zool. xl. 1884, pp. 108-120.

The suctorial cup is the subject of a paper by P. GIROD, who describes its structure and action. In *Octopus* the wall of the cup is active; in *Sepia* the wall is rigid and the central piston is the most essential part. Arch. Z. expér. (2) ii. pp. 379-401, pl. xx.; abstract in Am. Nat. x. p. 637.

H. FOL reviews the paper on the suctorial cups of *Sepiula* by NIEMIĆ, in Arch. Sci. nat. (2) xi. pp. 100-102; abstract also in J. R. Mier. Soc. (2) iv. p. 548.

OCTOPODA.

Octopus tuberculosus (Blainv. ?), off Barbadoes, 69 fath., and *pictus*, sp. n., Flannegan Passage and off Barbadoes, 27 and 69 fath., only 2 young specimens; Verrill, Bull. Mus. C. Z. xi. pp. 111 & 112, the latter pl. iii. fig. 3. *O. punctatus* (Gabb, 1862), from San Francisco to Sitka, and *bimaculatus*, sp. n., Panama and S. Diego, Calif.; *id. t. c.* pp. 117-123, pls. iv.-vi.

Octopus polyzenia (Gray), Torres Straits and Port Essington, *tenebricus*, sp. n., Port Denison, and *maculosus* (Hoyle), Port Jackson; E. A. Smith, Zool. Coll. Alert, pp. 34-36, pl. iv. figs. a-c.

Eledone cirrhosa (Lam.) found on the coast of Holland, and critical notes concerning, by C. Kerbert, Tijdschr. Nederl. Dierk. Ver. pp. 6-14, pl. i.

Leptoteuthis and *Eledonella*, gg. nn., Verrill, Tr. Conn. Ac. vi. pt. i., New England.

Eledonenta, g. n., Rochebrune, Bull. Soc. Philom. (7) viii. p. 152.

Opisthoteuthis, g. n. Near *Stauroteuthis* and *Cirroteuthis*, but body the head closely adnated to the brachial membranes, so as to entirely conceal the ventral portions; siphon projecting from the posterior end of the body, directed backwards; arms subequal, webbed to near their tips; suckers in a single row, a row of small tapered cirri alternating with them on the inner side of the arm. *O. agassizii*, sp. n., off Grenada,

West Indies, 291 fath. Verrill, Bull. Mus. C. Z. xi. pp. 113 & 114, pls. i. & ii.

Argonauta from Lord Howe's Island; Wilkinson, P. Linn. Soc. N. S. W. Feb. 1884.

CEGOPSIDÆ.

Loligopsis cyclura (Lesueur). 2 new specimens examined by J. Brock; they corroborate Steenstrup's view that *L. ellipsoptera* (Ad. & Rv.) is not specifically distinct: Nachr. Ges. Götting., No. 12, 1884, pp. 504-508.

Phasmatopsis, *Dictydiopsis*, *Doratopsis*, *Zygenopsis*, *Entomopsis*, and *Pyrgopsis*, gg. un. of *Loligopsidæ*; Rochebrune, Bull. Soc. Philom. (7) viii. pp. 7-28.

Cheireuteuthis lacertosa (Verrill), from off St. Vincent, West Indies, 230 fath.; Verrill, Bull. Mus. C. Z. xi. p. 107.

Abralia megalops (Verrill). Immature specimen from Barbadoes, 137 fath.; *id. t. c.* p. 105, pl. iii. fig. 4.

Sthenoteuthis bartramii (Les.). Fragment of an arm from 607 fath., West Indies; *id. t. c.* p. 106.

A gigantic squid, body about 50 feet long, seen floating on the surface off the Grand Bank of Newfoundland, by Capt. Keene, Bull. U. S. Fish. Comm. iv. p. 15.

MYOPSIDÆ.

Loligo subulata (Lam.) found on the coast of Holland; Kerbert, Tijdschr. Nederl. Dierk. Ver. p. 14, pl. ii.

Rossia brachyura, sp. n., Verrill, Bull. Mus. C. Z. xi. No. 5, p. 110, pl. iii. fig. 2, off St. Kitts, W. Indies, 208 fath.

Sepioloidea lineolata (Q. G.). Male described; the left arm of the ventral pair hectocotylised, as in *Sepiadarium* and *Idiosepius*; no trace of internal shell: Brock, Z. wiss. Zool. xl. pp. 105-107, woodcut.

Nectoteuthis, g. n. Near *Stoloteuthis*; distinguished by the free dorsal edge of the mantle, by the ventral shield projecting much farther forward, and by the very minute conical suckers, sessile on the end of stout tapering or conical pedicels, in the distal part of the sessile arms. *N. pourtalesii*, sp. n., only one specimen observed, probably a male, off Barbadoes, 180 fath. Verrill, Bull. Mus. C. Z. xi. pp. 108-110, pl. iii. fig. 1.

Diphtherosepion, *Rhombossepion*, *Lophossepion*, *Spathidosepion*, *Doratosepion*, *Ascarosepion*, and *Acanthossepion*, gg. un. of *Sepiade*; Rochebrune, Bull. Soc. Philom. (7) viii. pp. 74-112. *Hallia*, g. n., *id. t. c.* p. 113.

the

Procalistes, g. n. Based on a young Cephalopod with pedunculate eyes, taken by the 'Challenger' expedition; Ray Lankester, Q. J. Micr. Sci. xxiv. pp. 311-318, woodcuts.

PTEROPODA.

The shells of 9 genera and 47 species described and figured by Sowerby, Thesaur. Conch. pts. 41 & 42, pp. 139-148, pls. cccclxxiii. & cccclxxiv. (including *Atlanta*).

Cleodora lobata, sp. n., *id. t. c.* p. 143, pl. cccclxxiii. fig. 31, Atlantic.

HETEROPODA.

Pterotrachea coronata (Forsk.) with a pink coloured variety, *P. mutica* (Les.), and *hippopus* (Phil.), observed at Villafranca, the second prevailing from November to January, the third in February and March; by far the greater number of the male specimens are provided with a cup at the fin, but a few are without it; the majority of females have no cup. [For sensitive organs, vide *supra*, p. 18.] J. PANETH, Arch. mikr. Anat. xxiv. pp. 231-233.

Atlanta. The shells of 3 species in Sowerby, Thesaur. Conch. pts. 41 & 42, p. 148, pl. cccclxxiv.

GASTROPODA.

PECTINIBRANCHIA.

MURICIDÆ.

Murex brandaris and *inflatus*: operculum; Houssay, Arch. Z. expér. (2) ii. pp. 225-228, pls. x. figs. 7, 8, & 10, and xi. fig. 2. *M. scalaroiles* (Blainv.) = *distinctus* (Jan.); *edwardsii* (Payr.), *hybridus* (Arad.), *hellerianus* (Brusina), = *weinkauffianus* (Crosse); and *aciculatus* (Lam.) = *corallinus* (Scacchi), Mediterranean: Kobelt, Iconogr. europ. meer.-conch. pt. 2, pp. 17-20, pls. v. & vi. *M. coppingeri*, sp. n., Arafura Sea, *acanthostephes* (Watson), same locality, and notes on some other species; E. A. Smith, Zool. Coll. Alert, pp. 42-46, pl. v. figs. a-c. *M. (Ocinebra) pumilus* (A. Ad., 1853), *infans* and *darrosensis*, spp. nn., Amirantes; *id. t. c.* pp. 491 & 492, pl. xlv. figs. d-f.

Trophon. 8 European species (6 Northern, 2 Mediterranean) described and figured by Kobelt, Iconogr. europ. meer.-conch. pt. 2, pp. 24-30, pl. vi. *T. laminata*, *tumida*, *eburnea*[-us], spp. nn., Petterd, J. of Conch. iv. pp. 137, 141, & 142, Tasmania. *T. stangeri* (Gray, *Fusus*): many synonyms, among which *Purpura rugosa* (Q. G.) and *quoyi* (Rv.); Hutton, Tr. N. Z. Inst. xvi. p. 219.

Kalydon. Distinct from *Trophon* by the absence of varices; from *Urosalpinx* by the ovate operculum, with subapical nucleus. Type, *Trophon duodecimus* (Gray, *Fusus*); Hutton, Tr. Phil. Inst. Canterbury

(N. Z.), 1883, p. 216, and Tr. N. Z. Inst. xvi. p. 220, where also *Fusus plebejus* and *inferus* (Hutt.) are referred to this genus.

Trosalpinx contracta (Rv., *Buccinum*). Operculum similar to that of *Purpura*, Torres Straits; E. A. Smith, Zool. Coll. Alert, p. 47.

Meyeria alba (Jeffr.), German Sea, belongs, on account of its radula, to the *Muricidæ*; Kobelt, Iconogr. europ. meer.-conch. pt. 2, p. 31, woodcut, and pl. vi. fig. 21.

PURPURIDÆ.

Purpura lapillus and *hæmastoma* (L.): operculum; Houssay, Arch. Z. expér. (2) ii. pp. 206-214, pls. ix. figs. 8-11, 15, & 16, & x. figs. 2 & 3. *P. hæmastoma* (L.): varieties from the Cape Verde Islands; Tausch, JB. mal. Ges. xi. p. 185.

Lepsia, subg. n. of *Polytropæ*. Aperture ovate, rounded posteriorly; canal nearly obsolete, not recurved; columella excavated; operculum typical. *P. haustum* (Martyn). Hutton, Tr. N. Z. Inst. xvi. p. 223.

Concholepas peruviana. Operculum; Houssay, Arch. Z. expér. (2) ii. p. 214, pl. ix. fig. 12.

Coralliophila. 5 species from the Mediterranean described and figured by Kobelt, Iconogr. europ. meer.-conch. pt. 2, pp. 40-46, pl. viii. *C. amirantensis*, sp. n., E. A. Smith, Zool. Coll. Alert. p. 497, pl. xlv. fig. m, *amirantes*.

Rapa papyracea (Lam.). Operculum resembling that of *Purpura*; Fischer, J. de Conch. xxxii. p. 9, pl. ii. fig. 1. Literary history of this genus, and list of the 5 known species, by Crosse, t. c. pp. 11-14.

BUCCINIDÆ.

Semifusus, correction for *Hemifusus* (Swains.); Fischer, Man. de Conch. p. 624.

Megalatractus, subg. n. of *Semifusus*. Shell inflated, with strong spiral keels, umbilicated. *Fusus proboscidiiferus* (Lam.). *Id. t. c.* p. 625.

Pyrula (Lam.). P. Fischer points out how the species of this Lamarckian genus are to be distributed into different families and genera, by the radula and operculum; J. de Conch. xxxii. pp. 1-11.

Neptunea, including *Sipho*. 17 European species described and figured by Kobelt, Iconogr. europ. meer.-conch. pt. 3, pp. 60-80, pls. x.-xii.

Strombella callorhina (Dall) var. n. *stejnegeri*, sp. n., Dall, P. U. S. Nat. Mus. vii. p. 346, pl. ii. figs. 5 & 6, Behring Island.

Siphonalia mandarina (Duct., = *Fusus*) = *F. zealandicus* (Q. G.) = *F. reevianus* (Sow.); *S. dilatata* (Q. G., *Fusus*) = *F. adustus* (Phil.); *S. spodosa* (Martyn) = *rapphanus* (Lam.); all in New Zealand: Hutton, Tr. N. Z. Inst. xvi. pp. 228 & 229.

the union, subg. n. of *Siphonalia*. Last whorl angulated, spirally furrowed, with longitudinal ribs. Type, *Fusus dilatatus*, Quoy & Gaimard. Fischer's Man. de Conch. p. 625.

Euthria cornea (L. Wienk.) varr. nn. *crassilabrum* and *bellurdii*, Gregorio, Bull. Soc. mal. Ital. x. p. 226, Mediterranean. *E. flavescens*, sp. n.,

New Zealand, = *lineata* var. (Hutton, Manual of New Zealand Mollusca, 1880, p. 51); radula differs from that of *lineata*, both described and figured: Hutton, Tr. N. Z. Inst. xvi. p. 213, pl. xi. figs. 3 & 4.

Pisania maculosa (Gm.): operculum; Houssay, Arch. Z. expér. (2) ii. p. 216, pl. ix. figs. 4 & 17. List of New Zealand species: *P. lineata* (Martyn), with var. *pertinax* (Martens) and *traversi* (Hutt.); *vittata* (Q. J., *Fusus*) = *Bucc. trilineatum* (Rv.) = *Fusus bicinctus* (Hutt.), New Zealand: *id. t. c.* pp. 229 & 230.

Tritonidea curtisiana, sp. n., E. A. Smith, Zool. Coll. Alert, p. 47, pl. v. fig. e, Port Curtis.

Cantharus (Pollia) turricula, *subsiniatus*, and *multigranosus*, spp. nn., Maltzan, Nachr. mal. Ges. 1884 pp. 67 & 68, Gorée.

Buccinum undatum. Operculum; Houssay, Arch. Z. expér. (2) ii. p. 218, pl. x. figs. 5 & 6. Variability in the radula; Collin, Limfjordens mar. fauna, pp. 81-86, pl. i. figs. 1-14. A recent specimen from Sicily, somewhat corroded; Gregorio, Bull. Soc. mal. Ital. x. p. 115. *B. meridionale*, sp. n., with var. *album* and other varieties; Verkrüzen, Nachr. mal. Ges. 1884, pp. 98-103, Southern part of Newfoundland bank.

Cominella. List of known species: *C. testudinea* (Chemn.) = *cataracta* (Chemn., vol. x. fig. 1455); *C. virgata* (A. Ad.) = *Bucc. quoyi* (Rv.) = *Bucc. lineolatum* (Q. G.) = *Bucc. levigatum* (Hutt.); *C. nassoides* (Reeve, *Bucc.*) = *Bucc. zealandicum* (Hutt.) = *C. nodicincta* (Martens, *Bucc.*) = *Bucc. zealandicum* (Hutt.) = *C. nodicincta* (Martens, *Bucc.*) = *Bucc. costatum* (Q. G.) = *C. quoyana* (Ad.) = *C. lurida* (Hutt.); *C. lurida* (Phil.) = *Bucc. funereum* (Gould) = *zealandicum* (Hombr. & Jacq.): Hutton, Tr. N. Z. Inst. xvi. pp. 231-233.

Fulmentum, subg. n. of *Macron*. A strong lamella placed on the pillar closing the aperture behind. *Buccinum sepimentum* (Rang). Fischer, Man. de Conch. p. 654.

Phos nodicostatus (Sow.) var. from Amirantes; E. A. Smith, *t. c.* p. 496. *Nassaria suturalis* (A. Ad.). Synonymy; *id. t. c.* p. 49.

NASSIDÆ.

Nassa pachychilus, *muelleri*, *crossei*, *goreensis*, *heyneimanni*, spp. nn., and *argentea* (Marrat) var. n. *multicostata*, *incrassata* (Müll.) var. n. *senegalensis*, all from Gorée, Senegambia; Maltzan, Nachr. mal. Ges. 1884, pp. 68-70. *N. stigmatica* (A. Ad.), var. *densigranata* (A. Ad.), Amirantes; E. A. Smith, *t. c.* p. 496.

OLIVIDÆ.

Oliva caldania (Duclos) = *australis* (Duclos); Brazier, P. Linn. Soc. N. S. W. ix. p. 794. *O. lamberti*, sp. n., Jousseume, Bull. Soc. Z. Fr. ix. p. 180, New Caledonia.

Dactylidia petiti, sp. n., *id. t. c.* p. 179, Mayumba, W. Africa.

Ancillaria. 14 species from the Red Sea, about the third of all known, enumerated by Jickeli, J.B. mal. Ges. xi. pp. 189-193.

Baryspira, new section of *Ancilla*. The whole spire covered by the callosity of the pillar lip. *A. australis* (Sow.). Fischer, Man. de Conch. p. 600.

Sparellina, new section of the same genus. Suture covered, polished.
A. candida (Lam.). *Id. t. c.* p. 600.

FUSIDÆ.

Fusus. 7 species from the Mediterranean described and figured; *F. longurio* (Weink.) defended as distinct species: Kobelt, *Iconogr. europ. meer.-conch.* pt. 3, pp. 50-58, pls. viii., ix., & xv. *F. boettgeri*, sp. n., Maltzan, *Nachr. mal. Ges.* 1884, p. 67, Gorée. *F. cereus*, sp. n., E. A. Smith, *t. c.* p. 46, pl. v. fig. d, Port Curtis.

Taron (Hutt. 1882, *Zool. Rec.* xx. *Moll.* p. 42) belongs to the *Fusidæ*. Shell fusiform; canal short, slightly retroverted; columella smooth, aperture oval, the outer lip simple, no posterior canal. Radula resembling that of *Leucozonia*. Hutton, *Tr. N. Z. Inst.* xvi. p. 227; operculum and radula, *op. cit.* xv. pl. xiii. fig. e. *Fusus coreanicus* (Smith, 1879) is nearly allied.

Pleuroploca, subg. n. of *Fasciolaria* for the species provided with a tuberculated keel, as *F. trapezium* (L.). Fischer, *Man. de Conch.* p. 616.

Polygona clathratula (Martens, MS.), Gundlach, *An. Soc. Esp.* xii. p. 441, Porto Rico.

Latirus angustus, sp. n., E. A. Smith, *Zool. Coll. Alert*, p. 52, pl. v. *S. f.* Queensland.

Meyeria [see end of *Muricidæ*, p. 39].

TURBINELLIDÆ.

Turbinella, subg. *Tudicula* (H. & A. Adams). No generic value: emended description of *armigera* (A. Ad.) and *spinosa* (H. & A. Ad.): E. A. Smith, *t. c.* pp. 53 & 54, pl. v. figs. g & h.

Melapium (Ad.), allied to *Tudicula* (Bolten) and *Strepsidura* (Swains.); Fischer, *J. de Conch.* xxxii. p. 10.

MITRIDÆ.

Mitra tenuis (Sow.), Seychelles; E. A. Smith, *t. c.* p. 498, pl. xlv. fig. n. *M. proscissa* (Rv.), var. from Queensland, and note on *peasei* (Dohrn); *id. t. c.* pp. 54 & 55, the former pl. v. fig. f. *M. (Volutomitra) exigua* and *separanda*, spp. nn., and (*Costellaria*) *strictecosta*, sp. n., Maltzan, *Nachr. mal. Ges.* 1884, pp. 72 & 73, Senegambia.

Turricula (Callithea) bipartita, sp. n., E. A. Smith, *t. c.* p. 499, pl. xlv. fig. o, Providence Reef and Cerf Island, Mascarenes.

Cylindromitra. New name for *Cylindra* (Schumacher, 1817, *nec Cylindrus*, Montf., 1810); median tooth multicuspidate. Type, *Mitra crenulata* (Chemn., Lam.); Fischer, *Man. de Conch.* p. 614.

VOLUTIDÆ.

Voluta volva (Chemn.) var. from Torres Straits; E. A. Smith, *t. c.* p. 56, pl. v. fig. k.

COLUMBELLIDÆ.

Columbella seychellensis, Seychelle Islands, *cinninata* (Martens), *pupipiperata*, and *amirantium*, Amirantes, *albocaudata*, Providence Reef, Mascarenes, spp. nn., figured, *moleculina* (Duclos), Amirantes, Marquesas, and Solomon Islands, description, and *conspersa* (Gask.), colour described : Smith, t. c. pp. 493-495, pl. xlv. figs. g-l. *C. (Mitrella) triangulifera*, sp. n., and *broderipi* (Sow.) var. n. *lutea*, (*Anaëhis*) *freytagi*, sp. n., Maltzan, Nachr. mal. Ges. 1884, pp. 71 & 72, Gorée.

MARGINELLIDÆ.

Marginella picturata (Nevill) ; E. A. Smith, t. c. p. 499, pl. xlv. fig. p, Amirantes. *M. mixta*, *beddomei*, *johnstoni*, and *minima*, spp. nn., Petterd, J. of Conch. iv. pp. 143 & 144, Tasmania : *M. (Gibberula) liliputana* and *boettgeri*, spp. nn., Maltzan, t. c. p. 71, Gorée ; *M. hahni*, sp. n., Mabilie, Bull. Soc. mal. Fr. i. p. 131, Southern extremity of America ; *M. lucani*, Mayumba, W. Africa, and *gloriosa* (loc. ?), spp. nn., Joussemaume, Bull. Soc. Z. Fr. ix. pp. 175 & 176, pl. iv. fig. 7.

Gibberula lutea, sp. n., *id.* t. c. p. 177, pl. iv. fig. 6.

Volvaria lubrica, sp. n., Petterd, J. of Conch. iv. p. 143, Tasmania.

CONIDÆ.

The sixth volume of TRYON's Manual of Conchology deals with the *Conidæ* and *Pleurotomidæ*. Pt. 1 contains the generalities of *Conus*, and the descriptions and figures of about 200 species, arranged in the same manner as by Weinkauff, with many varieties, pp. 1-64, pls i.-xvi.

Notes from natives from New Britain concerning the poisonous bite of *Conus geographus*, by B. Hinds, P. Linn. Soc. N. S. W. ix. pp. 944 & 945.

Conus martensi and *articulatus*, spp. nn., Providence Reef, Mascarenes, E. A. Smith, t. c. pp. 488 & 489, pl. xlv. figs. a & b.

Cylindrus gillei, sp. n., Joussemaume, t. c. p. 188, pl. iv. figs. 1 & 2.

PLEUROTOMIDÆ.

Pleurotoma. 15 species from the Red Sea enumerated by Jickeli, JB. mal. Ges. ix. pp. 213-217. *P. multistriata*, sp. n., Jeffreys, J. G. Soc. xi. p. 321, pl. xv. fig. 4, Basement clay, Bridlington. *P. (Drillia) portia*, Persian Gulf, *amæna*, New Zealand, *auriformis*, locality unknown, *pupiformis*, Persian Gulf, (*Crassispira*) *hebes*, locality unknown, spp. nn., E. A. Smith, Ann. N. H. (5) xiv. pp. 317-319 ; *P. (Drillia) torresiana*, sp. n., Torres Straits, *laterculata* (Sow.), China Sea, with var. from Queensland, *spurca* (Hinds), N. and N.W. Australia, and *P. gracilentu* (Rv.), N. Australia, *id.* Zool. Coll. Alert, pp. 37-39, the three former pl. iv. figs. d-f ; *P. (Daphnella) arafurensis*, sp. n., *id.* t. c. p. 40, pl. iv. fig. g, N. Australia ; *P. (Daphnella ?) arcta*, sp. n., Japan and Persian Gulf, *id.* Ann. N. H. (5) xiv. p. 325 ; *P. (Defrancia ?) grisea*, sp. n., *id.* Zool. Coll. Alert, p. 489, pl. xlv. fig. c, Amirantes ; *P. (Clathurella) perinsignis*, Japan, *gemma* and *helenensis*, St. Helena, *lucida*, Bombay,

adamii, *jamaicensis*, and *graciliclathrata*, Jamaica, *horneana*, *crebrilirata*, Persian Gulf, spp. nn., *id.* Ann. N. H. (5) xiv. pp. 322-325; *P. (Mangilia) denticulata*, Mauritius, *grata*, locality unknown, *goodingii* and *sinclairii*, New Zealand, *albolabiata* and *scitula*, Persian Gulf, spp. nn., *id. t. c.* pp. 219-221. *P. (Cithara) guestieri* (Souv.) has no spiral striæ; Soubervie, J. de Conch. xxxii. p. 133.

Bela ampla, Arctic Seas, and *obliquigraduta*, locality unknown, spp. nn., E. A. Smith, Ann. N. H. (5) xiv. pp. 325 & 326.

Gymnobela, g. n., Verrill, Tr. Conn. Ac. vi. pt. 1, New England.

Cithara vitiensis and *matakuaana*, Viti Islands, *striatella* and *elevata*, Persian Gulf, *waterhousei* and *typica*, locality unknown, *seychellarum*, Seychelles, spp. nn., E. A. Smith, Ann. N. H. (5) pp. 326-329. *C. cylindrica* (Rv.) var.; *id.* Zool. Coll. Alert, p. 41, pl. iv. fig. h, Port Curtis.

Eucithara. New name for *Cythara* (Schumacher, *nec* Klein). Type, *Mangelia stromboïdes* (Reeve). Fischer, Man. de Conch. p. 593.

Bellardiella. New name for *Bellardia* (Bucquoy, *nec* Mayer). Type, *Mangelia gracilis* (Mont.). *Id. t. c.* p. 594.

Lienardia, g. n. Near *Clavatula* and *Clathurella*. Type, *Clav. rubida* (Hinds). *L. ocellata* and *marchei*, spp. nn., Indian Seas, Jousseau, Bull. Soc. Z. Fr. ix. pp. 184-188, pl. iv. figs. 4 & 5.

TEREBRIDÆ.

Terebra beddomei, sp. n., Petterd, J. of Conch. iv. p. 142, Tasmania.

CERITHIOPSIDÆ.

Cerithiopsis stejnegeri, sp. n., Dall, P. U. S. Nat. Mus. vii. p. 345, pl. ii. fig. 1, Unalashka, Aleutian Islands, and Behring Island.

Cerithiopsis johnstoni, sp. n., Petterd, J. of Conch. iv. p. 142, Tasmania.

CASSIDIDÆ.

Triton cutaceus and *nodiferus*: operculum: Houssay, Arch. Z. expér. (2) ii. pp. 220-224, pls. ix. figs. 13 & 14, x. figs. 1 & 9, & xi. fig. 1. *T. parthenopum* (Salis, 1793) varr. nn. *milonum* and *peribrantum*, Palermo, some Pliocene varieties of *T. corrugatum* (Lam.), *T. gyronoides* (Brocchi) = *nodiferum* (Lam.), varr. nn. *inflectilabrum*, *labroplitum*, *imperans*, and *singillum*; Gregorio, Bull. Soc. mal. Ital. x. pp. 95-101.

Tritonium kobelti, sp. n., Maltzan, Nachr. mal. Ges. 1884, p. 66, Gorée.

Persona smithi, sp. n., *id. t. c.* p. 65, Gorée.

Ranella reticularis (L., Born) = *gigantea* (Lam.), synonymy, and varr. nn. *bicanalata*, *mediterranea*, *parviraricata*, Mediterranean, var. n. *meneghini*, Miocene in the basin of Vienna; Gregorio, *t. c.* pp. 101-111.

Ranella pusilla, var. from Seychelles; E. A. Smith, Zool. Coll. Alert, p. 500.

Colubrellina. New section for *Ranella candidata* (Lam.), not defined; Fischer, Man. de Conch. p. 656.

Cassid. undulata (Gm.) var. n. *levilabiata*, Gregorio, *t. c.* p. 119, Mediterranean.

Plesioniscia. New section for *Oniscia tuberculosa* (Sow.), not defined ; Fischer, *Man. de Conch.* p. 660.

Dolium galea (L.) varr. nn. *spirintrorsum*, *tardina*, and *epidermata* from the Mediterranean ; Gregorio, *Bull. Soc. mal. Ital.* x. pp. 114 & 115.

CYPRÆIDÆ.

F. JOUSSEAUME divides them into 36 so-called genera, among which the following appear to be new :—

Gisortia. Type, *Opula gisortiana* (Val.) ; the recent *Cypræ mus* (L.) and *leucostoma* (Gask.) are included in it.

Zoila. *C. scottii* (Brod.), *thersites* and *marginata* (Gask.).

Mauxiena. *C. mauritiana* (L.).

Trona. *C. stercoraria* (L.), *gibba* (G.), and *thatcheri* (Cox).

Umbilia. *C. umbilicata* (Sow.).

Vulgusella. *C. tigris* (L.), *lynx* (L.), *mappa* (L.), &c.

Arabica. *C. arabica* (L.), *reticulata* (Martyn), *eglantina* (Ducl.), &c.

Luria. *C. lurida* (L.), *spudicea* and *reevei* (Gray), &c.

Zonaria. *C. punctatu* (L.), *pyrum* (Gm.), *physis* (Brocchi), &c.

Adusta. *C. nympha* (Ducl.), *onyx* (L.), *clandestina* (L.), &c.

Stolida. *C. stolida*, *hirundo*, *asellus* (L.), &c.

Cribraria. *C. becki* (Gask.), *cribraria* and *punctata* (L.), &c.

Ponda. *C. achatina* (Soland.), *arenosa* and *sulcidentata* (Gray).

Staphylæa. *C. staphylæa* (L.), &c.

Tessellatu. *C. tessellata* (Swains.).

Ipsa. *C. childreni* (Gray).

Nuclearia. *C. nucleus* (L.), *granulata* (Stearns), *madagascariensis* (Gm.).

Jenneria. *C. pustulata* (L.) and *duclosiana* (Bast.).

Pusula. *C. radians* (Lam.), *pediculus* (L.), *sanguinea* (Gray), &c.

Triviella. *C. oniscus* (Lam.), *ovula* (Lam.) *vesicularis* (Gask.), *carnea* (Gray), *australis* (Lam.), *formosa* (Gask.).

Niveria. *C. nivea* and *globosa* (Gray), *brevissima* (Sow.).

Trivirostra. *C. scabriuscula* (Gray), *oryzu* (Lam.), *subrostrata* (Gask.).

The name *Cypræa* is restricted to *C. cervus* and *exanthema* (L.) and *cervinella* (Kien.) ; the division containing *C. argus*, *testudinaria*, *talpa*, *carneola*, and *isabella* (L.), is called *Porcellana* (Klein.) ; *Trivia* (Gray) is restricted to *europæa* (Mont.), *pulex* (Sol.), *multilirata* (Sow.), and *rubescens* (Gray) ; all the genera are characterized. *Bull. Soc. Z. Fr.* ix. pp. 81–100.

Monetaria (Troschel). A. T. de Rochebrune restricts this generic name to the type of *Cypræa moneta* and *annulus* (L.), but multiplies the species ; *M. ethnographica*, Red and Indian Seas, *mercatorum*, Seychelles, Japan, and Islands Lavezzi on the coast of Corsica [?], *vestimenti*, N.W. Coast of Africa, Red Sea, and Zanzibar, *atava*, Cape Verde Islands, *Quaternary*, *pleuronectes*, Seychelles and Tongatuba, *camelorum*, N.W. Coast of Africa, *plumaria*, Sandwich Islands, *hamyi*, Red Sea and Zanzibar, *harmandiana*, Cochinchina and Japan, *perrieri*, Seychelles, Tongatuba, and Sandwich Islands, all spp. nn. ; further, *M. barthelemyi* (Bernardi), *icterina* (Lam.), *noumeensis* (Marie), and *obvelata* (Lam.) admitted as distinct species ; all figured ; the geographical distribution discussed ; the

occurrence on the N.W. Coast of Africa defended by the fact that one form is found in Quaternary beds of the Cape Verde Islands; the occurrence in the Mediterranean may be possibly ascribed to casual introduction [?]; the empty ^{shell} ~~valve~~ as ornament by several nations alluded to. Bull. Soc. mal. Fr. i. pp. 73-102, pls. i. & ii.

Cypræa. 30 species from the Red Sea enumerated by Jickeli, JB. mal. Ges. xi. pp. 194-213.

Trivia europæa. Living animal, pedal furrow, pore, and glands; Houssay, Arch. Z. expér. (2) ii. p. 272, pl. xiv. fig. 4.

PEDICULARIIDÆ.

Pedicularia. The known species enumerated and compared by C. T. Ancey, Nat. Sicil. ii. pp. 45-48.

NATICIDÆ.

Natica ampullaria (Lam.): operculum; Houssay, Arch. Z. expér. (2) ii p. 203, pl. vii. figs. 13 & 14. *N. limpidu*, sp. n., E. A. Smith, Zool. Coll. Alert, p. 57, pl. v. fig. 1, Torres Straits. *N. aimei* and *fabella*, spp. nn., Jousseau, Bull. Soc. Z. Fr. ix. pp. 181 & 183, pl. iv. figs. 10 & 11 (loc.?).

APORRHAIIDÆ.

Aporrhais pes-pelecani (L.) varr. nn. *panormitanus* and *viator*, Gregorio, Bull. Soc. mal. Ital. x. p. 118, Mediterranean.

CERITHIIDÆ.

Cerithium morus (Lam.), with varieties *moniliferum* (Dufr., Kien.) and *carbonarium* (Sow.), distinct from *tuberculatum* (L.), with varieties *variegatum* (Q. G.), *pupa* (Sow.), and *petrosus* (Wood), and from *patiens* (Bayle) = *rugosus* (Wood, nec Lam.); *C. nigrobalteatum* and *torresi*, spp. nn., Torres Straits, and *C. macrostoma* (Hinds), varieties and synonymy: E. A. Smith, Zool. Coll. Alert, pp. 63-67, the two new, pl. v. figs. n & o. *C. albovaricosum*, new name for *gracile* (Pease, nec Lam.), Providence Reef, Mascarenes, *C. amirantium*, sp. n., Amirantes, and *C. (Rhynoclavis) acutodulosum*, sp. n., Seychelles and Cerf Island, Mascarenes; *id. t. c.* pp. 501 & 502, pl. xlv. figs. q.-s.

Clava (Martyn) reintroduced for *Pyræzus*, including *Cerithium palustre* (L.). *Cl. caledonica*, sp. n., Jousseau, *t. c.* p. 191, pl. iv. fig. 12, New Caledonia.

Potamides fluviatilis (Pot. & Mich.). A species of *Astropecten* feeds on it, Fischer, J. de Conch. xxxii. p. 383.

Aphanistylus, subg. n. of *Potamides*. Eye-stalks long; "tentacles not visible;" shell decollated. Type, *C. charbonnier* (Petit). Fischer, Man. de Conch. p. 682.

Cerithidea tricarinata, sp. n., New Zealand, Hutton, Tr. N. Z. Inst. xvi. p. 214.

Bittium exilis [-e], sp. n., New Zealand, *id. ibid.*

Triforis. Jousseaume gives the full literary history of this genus, for which he proposes a separate family, mentioning that according to an observation made during the expedition of the 'Travailleur,' the animal is natatory, and provided with a large membranaceous velum instead of a foot. He distinguishes 11 genera, as follows:—

(A) With three apertures:

1. *Trituba*, g. n.; known only in fossil state. Type, *Trif. bituberculata* (Baudon), from Chaussy.
2. *Triforis* (Desh.); also only fossil. Type, *T. plicatus* (Desh.), from Valmondois.
3. *Iniforis*, g. n.; sinistral, elongated, 9 granulated, with more than 15 whorls. *I. malvaceus*, New Caledonia, and *douvillæi*, Mauritius, spp. nn., figs. 1 & 3.
4. *Mastonicforis*, g. n.; sinistral, fusiform, granulated; about 15 whorls. *M. chaperi*, sp. n., Bourton, figs. 4 & 5, and *M. ornatus* (Desh., *Triforis*).

(B) With 2 apertures:

5. *Stylia*, g. n.; only fossil. Type, *Triforis griguonensis* (Desh.).
6. *Metalepsis*, g. n.; only fossil. Type, *Trif. singularis* (Desh.).
7. *Inella* (Bayle, 1879) [*Ino* (Hinds), partly], g. n.; sinistral, elongated, with spiral rows of tubercles, flattened below; 15 whorls or more. *I. gigas* (Hinds, *Ino*), *blainvilli*, *mariei*, and *zystica*, spp. nn., New Caledonia, *rossiteri*, sp. n., Madagascar, figs. 6-9.
8. *Mastonia* (Hinds); elongated, fusiform, tuberculated, rounded below; about 15 whorls; a deep sinus. *M. rubra* (Hinds), *ducosensis*, *obesula*, *ægle*, *tricolor*, *cnodax*, *funebria*, and *limosa*, spp. nn., New Caledonia, *servaini*, sp. n., Aden, figs. 10-16.
9. *Euthymia*, g. n.; elongated, longitudinally furrowed and spirally ribbed, flattened at the base; 15 whorls or more. *E. regalis*, New Caledonia, *tibialis*, Tahiti, figs. 18 & 19, spp. nn., and *crenulata* (Desh.).
10. *Viriola*, g. n.; elongated, with smooth spiral ribs, flattened below; 15-30 whorls; mostly sinistral. *V. bayani*, sp. n., New Caledonia, fig. 20, *comata* (Montrouze, *Cerithium*), *corrugata* (Hinds), *trilirata* (Desh.), *dunkeri*, new name for *cingulata* (Dunker, nec Ad.), and *dextroversa* (Ad.).
11. *Sychar* (Hinds); shell glass-like, nearly smooth; apex mammillate. *S. vitreus* (Hinds).

Bull. Soc. mal. Fr. i. pp. 217-270, pl. iv.

Triphoris mirificus (Desh.), Amirantes; E. A. Smith, Zool. Coll. A. p. 502, pl. 44, fig. t.

Biforina, g. n., for *Triforis perversa* (L.); Bucquoy, Dautzenberg, & Dollfus, Moll. mar. du Roussillon, fasc. vi.

Planaxis, including *Quoyia*. 38 species described and figured by Sowerby, Thesaur. Conch. pts. 41 & 42, pp. 171-176, pls. cccclxxxiii. & cccclxxxiv.

MELANIIDÆ.

Melania cancellata (Bens.): variability; Gredler, Arch. f. Nat. 1. p. 260, footnote. *M. tumida* and *prænotata*, spp. nn., Prov. Hunan, China, Gredler, Arch. f. Nat. 1. pp. 278-280, pl. xix. figs. 9 & 10. *M. dunkeri*, sp. n., Heimbürg, Nachr. mal. Ges. 1884, p. 94, Japan, prov. Higo. *M. grangeri*, sp. n., Wattebled, J. de Conch. xxxii. p. 127, pl. vi. fig. 3, Cochín China. *M. pavici*, *lemgyrei*, and *dautzenbergiana*, spp. nn., Morlet, J. de Conch. xxxii. pp. 397-399, pls. xii. figs. 5 & 6, & xiii. fig. 1, Cambodia. *M. savinierei*, sp. n. (Brot, MS.), *id. t. c.* p. 330, Batavia. *M. apiensis*, *turbans*, and *ordinaria*, spp. nn., New Hebrides, E. A. Smith, P. Z. S. 1884, pp. 269 & 270, pl. xxiii. figs. 11-13.

Oncomelania (Gredl.) distinct from *Prososthenia* (Neumayr); Gredler, Arch. f. Nat. 1. p. 261, footnote.

Synolopsis (E. A. Smith, 1881) = *Fascinelina* (Stache, in Sandberger, 1871, Eocene); Tausch, SB. Ak. Wien, xc. pp. 67-69, pl. ii. figs. 10 & 11.

Pyrgulifera, Meek, 1872. To this genus, first known from the Laramie beds in North America, L. Tausch refers not only a number of tertiary fresh-water shells from Hungary, Austria, and France, which were hitherto determined as *Paludomus*, but also the recent *Paramelania*, E. A. Smith, 1881, from Lake Tanganyika. The known fossil and living species are described and figured, the latter copied from E. Smith's paper; SB. Ak. Wien, xc. pp. 56-70, pls. i. & ii.

Melanella. Bourguignat divides the known *M. holandri* into two series, *zonata* and *lavigata* [as already Rossmassler, Iconogr. ii. 1839, p. 37, var. *legitima* and var. *lavigata*]: the former into two groups, *holandriana* and *fagotiana*; the latter into four, *lavigatiana*, *crassiana*, *letourneuxiana*, and *speciosiana*; and, finally, these all into 27 so-called species, among which the following new names occur:—*divina*, *eximia*, *agnatella*, *pillariana*, *crassilabris*, *fagotiana*, *krapinensis*, *gigantea*, *berlani*, *ovoidæa*, *amblya*, *letourneuxi*, *bourguignati*, *castanea*, *codiella*, and *speciosa*, given by the author himself, Letourneux, or Servain. Bourguignat, Melan. syst. Europ. (Ann. Soc. Mal. ii.) pp. 7-29.

Fagotia, g. n., proposed for *Melanopsis esperi* (Fer.) and *audebardi* (Prevost), on account of the pillar lip being not truly truncated and the shell spotted. Subdivided into 4 groups: *esperiana*, *locardiana*, *letourneuxiana*, and *acroziana*; and 22 so-called species, among which the following new names: *rossmaessleri*, *berlani*, *danubialis*, *pfeifferi* (C. Pfeiffer, Deutsche Moll. pl. viii. figs. 26 & 27), *anceyana*, *pusilla*, *locardiana*, *ascanica*, *gravida*, *stenostoma*, *anatolica*, from Ismidt in Asia Minor, *servainiana*, *nocturna*, *letourneuxi*, *pillariana*, *saint-simoniana*, *acrozia*, and *bourguignati*, given either by the author himself, Letourneux, or Servain. Bourguignat, Melan. syst. Europ. pp. 30-49.

Microcolpia, g. n., proposed for *Melanopsis acicularis* (Fer.). Pillar lip pointed, limited by a furrow which forms a sort of notch at its lower end. Subdivided into 5 groups: *acicularia*, *praclariana*, *servainiana*, *villeserriana*, *pyramidaliana*, and *potamactebiana*; and into 19 so-called species, among which the following new names: *praclara*, *servaini*, *coutagniana*, *hagenmuelleriana*, *rochebruniana*, *villeserriana*, *mabilliana*, *gallandi*, *canali-*

culata, *peracuta*, *stossichiana* (Rossmässler, figs. 673 & 675), *letourneuxi*, and *pachystoma*. Bourguignat, *t. c.* pp. 49-66.

Melanopsis. Bourguignat gives an historical account of the genus, and limits it to the species with well-marked truncation of the pillar lip, and divides it into 24 groups and 95 so-called species, among which the following new names: *spheroidæa*, *microcolpia*, *episema*, *mzabica* (fig., Bourg., Mal. Alg. pl. xvi. figs. 1, 2, 8, & 11), *callichroa*, *minutula*, *myosotidæa*, *coupfa*, *olivieri*, *obesa* (fig., Rossm. iii. 837), *bofilliana*, *mauritanica* (fig., Rossm.-Kobelt, figs. 1883 & 1887), *seignetti* (fig., Rossm.-Kob., fig. 1884), *pleurotomidæa*, *subscalaris* (fig., Bourg., Mal. Alg. pl. xv. fig. 20), *guiraoi* (fig., Brot., Melan. pl. xlvii. figs. 16 & 17), *mohammedi* (fig., Morelet, J. de Conch. 1880, pl. iii. fig. 6), *belonidæa* (Mal. Alg. pl. xvi. figs. 5 & 6), *cossoni*, *subgraellsiana* (fig., *op. cit.* pl. xv. fig. 26, and Rossmässler, iii. 840, 842, & 843), *acutespira* (fig., Rossm. 844) *isseli* (fig., Mal. Alg. pl. xv. fig. 25), *callista*, *sesteri*, *alepi*, *stephanota* (fig., Rossm.-Kobelt, figs. 1899 & 1900), *hiera* (fig., *t. c.* 1904), *vespertina*, *jebusitica*, *aterrima*, *sancta* (fig., Rossm.-Kobelt, fig. 1901), *cerithiopsis*, *hebraica*, *lampira*, *phœniciaca*, *belusi*, *desertorum*, *subcostata* (fig., Encycl. meth. pl. ccccxlviii. fig. 7), *tanousi*, *obliqua*, *ovum* (fig., Rossm.-Kobelt, fig. 1906), *feliciani*, *eumorphia*, *egregia*, *magnifica* (fig., Chemnitz, Conch. Cab. x. figs. 2082 & 2083), *pleuroplagia*, *macrostoma*, *rossmaessleri* (fig., Rossm. ii. fig. 680), *microstoma*, *pechaudi*, *heliophila*, *ovula*, given mostly by the author himself, *solus*. Letourneux. Bourguignat, Melan. syst. Europ. pp. 67-165.

TURRITELLIDÆ.

Turritella higginsi, sp. n., Petterd, J. of Conch. iv. p. 135, Tasmania.

Mesalia: differences from *Turritella*; Jeffreys, P. Z. S. 1884, p. 131. *M. freytagi*, sp. n., Maltzan, Nachr. mal. Ges. 1884, p. 68, Gorée.

Stilbe, g. n. Shell forming an elongated cone, smooth, and of a glittering lustre; nucleus or apex of the spire regularly and bluntly pointed; mouth somewhat angular at the base; neither soft parts nor operculum known. *S. acuta*, sp. n., Atlantic. Jeffreys, P. Z. S. 1884, p. 120, pl. x. fig. 2.

LITTORINIDÆ.

Littorina: operculum; Houssay, Arch. Z. expér. (2) ii. pp. 180-186, pl. vii. figs. 1-7. *L. mauritiana* (Lam.): varieties and synonymy; E. A. Smith, Zool. Coll. Alert, p. 60. *L. globosa*, sp. n., Jeffreys, J. G. Soc. xi. p. 320, pl. xv. fig. 1, Basement clay, Bridlington.

Couthouyia (Ad., as subg. of *Fossarus*) regarded as a distinct genus, and the 4 species described by H. Crosse, J. de Conch. xxxii. pp. 15-18. *reticulata* (Ad.) figured, pl. ii. fig. 2.

Lacunella, subg. n. of *Lacuna*. Depressed, heliciform, few-whorled, with a strong epidermis, umbilicated, devoid of the excavated groove which gives the genus its name; aperture with a narrow reflexed margin. *L. reflexa*, sp. n., Pribiloff and Aleutian Islands and Behring Island. Dall, P. U. S. Nat. Mus. vii. p. 344, pl. ii. figs. 1-3.

Risella lutea (Q. G.): varieties and synonymy; E. A. Smith, Zool. Coll. Alert, p. 61.

RISSOIDÆ.

Rissoina. Monograph continued and finished by H. C. Weinkauff, in Küster's Conch. Cab: pt. 330, pp. 81-97, pl. xv. D: *R. (Fairbankia) bombayana* (Blanf.), Bombay, p. 81, pl. xv. C, fig. 8; *R. pseudobryeria* and *bastereana* (Nevill), Red Sea, pp. 82 & 84, pl. xv. D, figs. 1 & 7, not before figured; *subvillica* and *pseudoprinceps*, new names for *villica* and *princeps* (Sow., in Reeve, *nec* Gould & C. B. Ad.) pp. 88 & 93. 20 species from the Red Sea enumerated; *erythraea* (Phil., *nec* Schwartz v. Mohrenstern) = *sequenziana* (Issel), *dimidiata*, *assimilis*, and *angulata* (Jickeli, 1881), figured; Jickeli, JB. mal. Ges. xi. pp. 255-265, pl. vi. *R. curtisi*, sp. n., E. A. Smith, Zool. Coll. Alert, p. 69, pl. v. fig. m, Port Curtis. *R. approximata* [-ans], sp. n., Petterd, J. of Conch. iv. p. 141, Tasmania. *R. annulata*, sp. n., Hutton, N. Z. J. Sci. ii. p. 173, New Zealand.

Rissoa. Monograph containing 127 species, including *Alvania*, *Onoba*, *Hyala*, by H. C. Weinkauff, in Küster's Conch. Cab. pts. 330 & 333, pp. 100-193, pls. xviii.-xxv.; *R. (Alvania) interfossa* (Nevill), Indian Sea, p. 160, pl. xix. fig. 16, apparently not before figured. List of 32 species from the Mediterranean and adjacent parts of the Atlantic, from the 'Lightning' and 'Porcupine' Expedition, with synonyms and critical notes: *R. fischeri*, Tunis, 30-120 fath., *parvula*, Tangiers, *angulata*, Adventure Bank, Mediterranean, *turricula*, Atlantic, *deliciosa*, Atlantic and Mediterranean, *affinis*, Vigo Bay, spp. nn., and *subsolata* and *testæ* (Aradas and Maggiore). Bay of Biscay and Mediterranean, figured; Jeffreys, P. Z. S. 1884, pp. 111-127, pl. ix. figs. 1-8. *R. subperforata*, sp. n., *id.* J. G. Soc. xi. p. 320, pl. xv. fig. 2, Basement clay, Bridlington. *R. wyville-thomsonii*, Jeffr., t. c. fig. 3. *R. lineata*, *dubius* [-a], *bicolor*, *approxima* [-ans], *badia*, *diemenensis*, *pulchella*, and *layardi*, spp. nn., Petterd, J. of Conch. iv. pp. 137 & 138, Tasmania.

Apicularia, g. n., for *Rissoa similis* (Scacchi), *subcostulata* (Schw.), &c.; Monterosato, Nat. Sicil. iii. p. 139.

Alvania consociella, sp. n., *id.* t. c. p. 159, Coasts of Southern France and Western Italy.

Alvinia, subg. n. of *Alvania*. The spiral elements prevailing in the sculpture. *A. weinkauffi* (Schw.), *subareolata* (Monterosato), *dictyophora* (Phil.), and *philippiana* (Jeffr.). *Id.* t. c. pp. 160 & 161.

Acinus, g. n. Sculpture granular, without spiral ribs; aperture distinctly dentate. *A. cimex* (L.), *cingulatus* (Phil.), and *subcrenulatus* (Schwartz, MS.), sp. n., common in the Mediterranean. *Id.* t. c. p. 161.

Acinopsis, g. n. Sculpture latticed, aperture subcanaliculate with a prominent knob below. *A. cancellatus* (Dacosta) = *Rissoa crenulata* (Mich.), and *hirta*, sp. n., Sicily and Naples. *Id.* t. c. p. 162.

Guleodina, subg. n. of ?. Sculpture keeled, almost always varicose, as in *Cassia*; aperture smooth internally, peristome thickened. *G. striatula* (Dacosta) = *Rissoa trochlea* (Phil.). *Id.* t. c. p. 163.

Thapsia, subg. n. [preoccupied in *Nanina* by Albers]. Spire turrite;

shape and sculpture somewhat like those in *Melania*. *T. rudis* (Phil., Risso). Monterosato, *t. c.* p. 227.

Cingulina, subg. n. of *Cingula*. Shell obtuse, globular, perforated. *C. obtusa* (Cantr.), = *alderi* and *soluta* (Jeffr.). *Id. t. c.* p. 228 [= *Cingula*, A. & H. Adams, 1858].

Cingilla, g. n. Sculpture consisting of numerous spiral striæ crossing one another; pillar lip with a calcareous deposit. *C. trifasciata* (Alder) = *cingillus* (Mont.) and *picta* (Wats.). *Id. ibid.*

Cingula limbata, sp. n., New Zealand, Hutton, Tr. N. Z. Inst. xvi. p. 214.

Paludestrina cornea (Risso, *Leachia*) = *muriatica* (Phil.), distinguished by the sigmoid curve of the lines of growth; Monterosato, Nat. Sicil. iii. p. 230.

Leachia (Risso, 1824) = *Peringia* (Palad., 1870). Border of the aperture well circumscribed, slightly auriculated below; whorls flat. *L. viridescens* (Risso) = *Paludina salinesii* (Calcare and Aradas). *Id. t. c.* pp. 230 & 231.

Barleeia rubra (Mont.), *haliotiphila* and *subtenuis* (Carp.); Weinkauff, in Küster's Conch. Cab. pt. 330 (Risso), pp. 98-100, only the first figured, pl. ii. figs. 20-22.

Eutoniella. E. A. Smith's 3 species reproduced by Weinkauff, in Küster's Conch. Cab. pt. 333, pp. 194-196, pl. xxv. figs. 15-17.

Setia (Jeffr.). Sub-terrestrial, on the level of the water, as *Literina*. To this genus belong the Mediterranean species: *fusca* (Phil., *Truncatella*) = *Rissoa paludinoidea* (Calcare), *globulina*, sp. n., *pygmaea* (Mich., Risso), *sciatiana* (Ar. & Ben.), *inflata* and *turriculata*, spp. nn., *soluta* (Phil.), *amabilis* (Monteros.), *alleryana* (Arad.), *limpida*, sp. n., and ? *messanensis* (Seguenza, Risso). Monterosato, Nat. Sicil. iii. pp. 278 & 279.

Parvisetia, subg. n. of *Setia*. Imperforate, with spire short, obtuse; aperture semilunar. *P. scillæ* (Seguenza, Risso). *Id. t. c.* p. 280.

Microsetia, subg. n. of *Setia*. Microscopical, glittering, intensely coloured, imperforate. *M. cossuræ* (Calcare, Risso) = *fusciata* (Requien); *M. microscopica* (Seguenza, Risso), *fulgida* (Ad.), *cæolata*, sp. n., and *ochroleuca* (Brusina, 1869). *Id. ibid.*

Pseudosetia, g. n. Shape of *Setia*, but abyssal. *P. turgida* (Jeffr., Risso), *tumidula* (G. O. Sars), *ficaratiensis* (Brusina), and *macilenta* (Monterosato, *Setia*). *Id. t. c.* p. 281.

Ammonicerina (O. G. Costa, 1861) = *Homalogyra* (Jeffr., 1867); *id.* Nat. Sicil. iv. p. 21.

Homalogyra densicostata, sp. n., Jeffreys, P. Z. S. 1884, p. 129, pl. x. fig. 1, Atlantic.

Hydrobia. Historical notes on this genus, and *H. aponeensis* (Martens) var. *n. foxianensis*, inhabiting a salted spring at Pradilama, near Pieve Fosciana, Prov. Massa; Stefani, Bull. Soc. mal. Ital. ix. pp. 200-204. *H. compacta*, sp. n., Jeffreys, P. Z. S. 1884, p. 128, pl. ix. fig. 9, Tangiers. *H. yvonneana*, sp. n., Wattebled, J. de Conch. xxxii. p. 130, pl. vi. fig. 7, Cochin China.

Pyrgula nevadensis (Stearns). Radula and variations in length and

breadth; Ellsworth Call & Beecher, Am. Nat. xviii. pp. 851-855, woodcuts and table.

Amnicola positura, sp. n., Petterd, J. of Conch. iv. p. 159, Richmond River, N. S. W.

Pseudamnicola, g. n. Proposed by Mad. Paulucci for the European species of *Amnicola*, as *A. lucensis* (Issel), the typical North American species being distinguished by the structure of the operculum. Stefani, Bull. Soc. mal. Ital. ix. pp. 199 & 200.

Bythinella opaca (Ziegl.) var. n. *gracilior*; *id. t. c.* p. 104, Apuan Mountains.

Emmericia. Brusina reduces the 67 species which were distinguished by Bourguignat, to three principal varieties of 1 species, *patula* (Brumati); J.B. mal. Ges. xi. pp. 104-111.

Stenothyra dorriana and *decollata*, spp. nn., Wattebled, J. de Conch. xxxii. p. 129, pl. vi. figs. 5 & 6, Cochinchina.

PALUDINIDÆ.

Paludina vivipara. Operculum; Houssay, Arch. Z. expér. (2) ii. pp. 230-232, pl. xi. fig. 9.

Paludina. 2 species with 10 varieties in Italy, among which *vivipara* [*fasciata*] var. n. *kobeltiana* = Kobelt-Rossmässler v. fig. 1373, and var. n. *rosmaessleri* = Rossmässler i. fig. 125; Caroti, Bull. Soc. mal. Ital. ix. pp. 271-279. *P. tiranti* and *thomsoni*, spp. nn., Morlet, J. de Conch. xxii. pp. 394 & 395, pl. xii. figs. 3 & 4, Cambodia.

G. Servain distinguishes *Vivipara ranarum*, *bourguignati*, *pætiliana*, *albisiana*, and *penthica*, spp. nn., all from the environs of Hamburg; Bull. Soc. mal. Fr. i. pp. 173-182.

Bocourtia, g. n. Testa imperforata, ovato-oblonga, sulcata, anfractibus subventricosus, epidermide fulva indutis; columella subcallosa, curvata; apertura ovato-elliptica, labro recto, simplice. *B. lymnæformis* [*limnæif*] and *fasciata*, spp. nn., Bangkok. Rochebrune, Bull. Soc. Philom. (7) vi. pp. 117 & 118.

Bythinia. 7 species, with 9 varieties in Italy. *B. boissieri* (Charp.) varr. nn. *curta* and *intermedia*, *B. orsinii* var. n. *tumida*, and *B. amnicolina*, sp. n., Sicily; Caroti, Bull. Soc. mal. Ital. ix. pp. 279-293. *B. tentaculata*: operculum; Houssay, Arch. Z. expér. (2) ii. p. 235, pl. xi. figs. 5-8 & 12. *B. gravida* and *ardussonica*, spp. nn., J. Ray, Bull. Soc. mal. Fr. i. pp. 155 & 156, Dep. Aube, France. *B. misella*, sp. n., Gredler, Arch. f. Nat. l. p. 276, pl. xix. fig. 8, Prov. Hunan, China. *B. crosseana*, sp. n., Wattebled, J. de Conch. xxxii. p. 127, pl. vi. fig. 4, Cochinchina. *B. richmondiana*, sp. n., Petterd, J. of Conch. iv. p. 159, Richmond River, N. S. W.

VALVATIDÆ.

Valvata piscinalis var. n. *cancellata*, Baudon, J. de Conch. xxxii. p. 294, pl. x. fig. 5, Dep. Aube.

Valvata imperialis, sp. n., Dep. Seine-et-Oise, and list of 11 (so-called)

French species of this genus, the former and *V. bourguignati*, *penthica*, and *subfasciata* figured; Bourguignat, Bull. Soc. mal. Fr. i. pp. 183-188, pl. iii. figs. 6-10. *V. macsi* (Bourg., MS.), Locard, Bull. Soc. Z. Fr. i. p. 207, Dep. Manche, near *helvetica* (Bourg.) and *frigida* (Westerl.). *V. anapensis* and *monterosati*, spp. nn., Cafici, Nat. Sicil. iii. p. 216, Sicily. *V. cleveleusea* and *V. hagenmuelleri* (Bourguignat, MS.), spp. nn., with notes on some other species; Hagenmüller, Bull. Soc. mal. Fr. i. pp. 212-216. *V. rothi*, *pharaonum* and *schweinfurthi* (Bourg., MS.), *khedivialis* and *petrettinii* (Letourneux, MS.), spp. nn., Egypt, and list of other species from that country; Iunes, t. c. pp. 346-352. *V. minutissima*, sp. n., Wattebled, J. de Conch. xxxii. p. 131, pl. vi. fig. 8, Cochinchina.

AMPULLARIIDÆ.

Ampullaria polita. Operculum; Houssay, Arch. Z. expér. (2) ii. p. 232, pl. xi. figs. 10 & 11.

VANIKORIDÆ.

Vanikoro. 24 species; Sowerby, Thesaur. Conch. pts. 41 & 42, pp. 167-170, pl. cccclxxxii.

CALYPTRÆIDÆ.

Crypta unguiformis (Lam.). Radula; Hutton, Tr. N. Z. Inst. xvi. p. 214.

CAPULIDÆ.

Hipponyx cornu-copiae. Its calcareous support homologous to the operculum of other Gastropods, fixed to other bodies by its upper face, the foot being much reduced, and the horse-shoe-shaped muscle being the columellar muscle of other snails; Houssay, Arch. Z. expér. (2) ii. p. 228, pl. xi. figs. 13 & 14.

VERMETIDÆ.

Vermetus triqueter: suprapedal glands; Houssay, Arch. Z. expér. (2) ii. pp. 254-258. *V. panormitanus*, sp. n., Gregorio, Bull. Soc. mal. Ital. x. p. 119, Palermo.

Siliquaria. 13 species; Sowerby, Thesaur. Conch. pts. 41 & 42, pp. 163-165, pls. cccclxxx. & cccclxxxi.

CÆCIDÆ.

Notes on the species of the Mediterranean, by Monterosato, Nat. Sicil. iv. pp. 22-24.

Spirolidium (O. G. Costa, 1861) = *Parastrophia* (Folin, 1869); *id. t. c.* p. 21.

Parastrophia folini, sp. n., Bucquoy, Dautzenberg, & Dollfus, Moll. mar. du Roussillon, fasc. vii., S. France and Tunis.

SCALARIIDÆ.

Scalaria vittata, Mediterranean and W. Coast of Africa, *nana*, Setubal and Bay of Biscay, *semidisjuncta*, Atlantic, *tenera*, Atlantic, *formosissima*, Azores, *coartata*, new name for *obtusicastrata* and *varicosa* (G. O. Sars, nec S. Wood & Brocchi), *longissima* (Seguenza), and *acus* (Watson), figured; Jeffreys, P. Z. S. 1884, pp. 132-141, pl. x. *S. dalliana* (Verr.) = *clathratula* (Turt.); *id.* Rep. Brit. Ass. 1884, p. 553.

Acirsa prælonga (Jeffr., 1877) figured; *id.* P. Z. S. 1884, pl. x. fig. 11.

Crossea minuta, sp. n., Petterd, J. of Conch. iv. p. 139, Tasmania.

Aclis. 4 known species, with synonymy, geographical range, and short descriptions; Jeffreys, P. Z. S. 1884, pp. 324-344. *A. (Rissopsis) hyalina*, sp. n., Hutton, N. Z. J. Sci. ii. No. 4, p. 173, New Zealand. *A. micra* and *turrita*, spp. nn., Petterd, J. of Conch. iv. pp. 136 & 140, Tasmania.

Cioniscus gracilis and *striatus*, spp. nn., Jeffreys, P. Z. S. 1884, pp. 341 & 342, pl. xxvi. figs. 1 & 2, Bay of Biscay and Mediterranean.

Pherusa (Clark) restored to *Menippe* (Jeffr.), which is preoccupied; *id.* t. c. p. 344. [But *Pherusa* is preoccupied for a Crustacean and a Bryozoan.—REC.]

PYRAMIDELLIDÆ.

Pyramidella 4 spp., *Obeliscus* 7, *Elusa* 3 [*rueppeli* (Jickeli, 1883) with woodcut], *Syrnola* 7, and *Orina* 1 sp., from the Red Sea, all with full synonymy, enumerated by Jickeli, JB. mal. Ges. xi. pp. 245-255.

Pyramidella nitidula, A. Ad. (*Syrnola*), Bay of Biscay and Mediterranean, Jeffreys, P. Z. S. 1884, p. 363, pl. xxvii. fig. 8.

Odostomia suboblonga, *tenuis*, *prælonga*, *crassa*, *sigmoidea*, *flexuosa*, *sinuosa*, *acuticostata*, *fulgidula*, *attenuata*, *compressa*, and *semicostata*, spp. nn., Atlantic and Mediterranean, with notes on many other species, including *Chemnitzia* and *Eulimella*; *id.* t. c. pp. 345-363, pls. xxvi. figs. 3-10, & xxvii. figs. 1-7.

Turbonilla fushiana (Verr.) = *Odostomia magnifica* (Seguenza); *id.* Rep. Brit. Ass. 1884, p.

Chemnitzia coppingeri, sp. n., E. A. Smith, Zool. Coll. Alert, p. 505, pl. xlv. fig. w, Providence Reef, Mascarenes; *C. beddomei*, sp. n., Petterd, J. of Conch. iv. p. 136, Tasmania.

Eulimella smithii (Verr.) = *unifasciata* (Forb.); Jeffreys, Rep. Brit. Ass. 1884, p. 553.

Mathilda quadricarinata (Brocchi). Living animal described; apex of the shell figured; *id.* P. Z. S. 1884, p. 364, pl. xvii. fig. 9.

EULIMIDÆ.

Eulima glabra, *fusco-apicata*, *abbreviata*, *subumbilicata*, *minuta*, and *subobtusata*, spp. nn., Atlantic and Mediterranean, *jeffreysiana* (Brusina), and *piriformis* (Brugnone), figured, and notes on other species; Jeffreys, P. Z. S. 1884, pp. 365-371, pl. xxviii. *E. martinii* (A. Ad.) var. from

Torres Straits; E. A. Smith, Zool. Coll. Alert, p. 58. *E. vitrea* and *aurantia*, spp. nn., Petterd, J. of Conch. iv. pp. 136 & 144, Tasmania.

Gegania, g. n. Shell conical, reticulated, not umbilicated; nucleus globular and intorted, not spiral nor sinistral. Differs from *Mathilda* by the short spire and by the intorted but not heterostrophe apex. *G. pinguis*, sp. n., Jeffreys, P. Z. S. 1884, p. 365, pl. xxvii. fig. 10, Atlantic.

Stylifer. 18 species; Sowerby, Thesaur. Conch. pts. 41 & 42, pp. 159-161, pl. cccclxxix.; *S. dubius* (Baird, MS.), New Caledonia, and *bulbiformis*, St. Thomas, spp. nn., figs. 6 & 19. *S. robusta* [-us] and *loderue*, spp. nn., Petterd, J. of Conch. iv. p. 140, Tasmania.

RHIPIDOGLOSSA.

NERITIDÆ.

Neritina fluviatilis (L.): operculum; Houssay, Arch. Z. expér. (2) ii. pp. 199-203, pl. ix. figs. 1-3 & 5. *N. cariosa* (Gray) is the species from the Sandwich Islands; E. A. Smith, P. Z. S. 1884, p. 275.

Neritodonta (Brusina). Exceptionally we may refer to this genus, founded on tertiary species of *Neritina* provided with an internal tooth near the base of the aperture, which is also found in many recent exotic species, chiefly of the subgenus *Neritina* and *Neritodryas*. Many tertiary specimens show strange notches on the pillar lip, which caused Bourguignat to create several genera on them, as *Calvertia*, *Petrettinia*, and *Saint-Simonia* (Lettres malacologiques, 1882, with plate); but these notches are regarded as accidental damages by Brusina, JB. mal. Ges. xi. pp. 60-99.

Nerita saturata, new name for *atrata*, (Lam., Reeve, nec Chemnitz); Hutton, P. Linn. Soc. N. S. W. ix. pt. 2, p. 354 [March-May, 1884]. *N. melanotragus*, new name for *atrata* (Reeve, nec Chemnitz), = *nigra* (Gray, nec Chemnitz), New Zealand, Australia, and Tasmania; E. A. Smith, Zool. Coll. Alert, p. 69 [June, 1884; the same as the preceding].

Neritopsis. 1 species; Sowerby, Thesaur. Conch. pts. 41 & 42, p. 170, pl. cccclxxxii.

TROCHIDÆ.

Phasianella. 22 species described and figured by Sowerby, Thesaur. Conch. pts. 41 & 42, pp. 149-152, pls. cccclxxv. & cccclxxvi.

Turbo argyrostomus (L.): operculum; Houssay, Arch. Z. expér. (2) ii. pp. 188-192, pl. vii. fig. 9. *T. histrio* and *turcius* (Rv.), Amiran; E. A. Smith, Zool. Coll. Alert, pp. 503 & 504, the latter, pl. xlv. fig. u.

Calcar cookianum. Operculum; Houssay, Arch. Z. expér. (2) ii. p. 188, pl. vii. fig. 10.

Delphinula, 14, and *Liotia*, 26 species; Sowerby, Thesaur. Conch. pts. 41 & 42, pp. 153-157, pls. cccclxxvii. & cccclxxviii.

Liotia compacta and *loderæ*, spp. nn., Petterd, J. of Conch. iv. p. 135, Tasmania.

Cyclostrema micra and *harrictæ*, spp. nn., *id. t. c.* pp. 140 & 141, Tasmania. *C. fluctuala*, sp. n., Hutton, Tr. N. Z. Inst. xvi. p. 215, New Zealand.

Trochus cinerarius: operculum; Houssay, *t. c.* pp. 196-199, pl. viii. figs. 10-12 & 14. *T. (Gibbula?) amirantium*, sp. n., E. A. Smith, *t. c.* p. 504, pl. xlv. fig. v., Amirantes.

Trochus (Thalotia) torresi, sp. n., *id. t. c.* p. 72, pl. vi. fig. a, Torres Straits.

Trochus (Euchelus) atratus (Gm.): variability and synonymy; *id. t. c.* pp. 72 & 73.

Trochus (Monilea) lifuana (Fischer); *id. t. c.* p. 73, pl. vi. fig. b, Torres Straits.

Trochus (Isanda) coronata (A. Ad.), Port Curtis and Torres Straits: emended description; *id. t. c.* p. 71, pl. v. fig. p.

Latona, subg. n. of *Monodonta*. Shell as in *Diloma*, but perforated. *M. mimetica* (Hutton, 1878), New Zealand. Hutton, P. Linn. Soc. N. S. W. ix. pt. 2, p. 368.

Margarita regalis (Verr.) = *Trochus otto* (Phil.); Jeffreys, Rep. Brit. Ass. 1884, p. 553.

Rotella. 14 species; Sowerby, Thesaur. Conch. pts. 41 & 42, pp. 135-137, pl. cccclxxii. *R. infraplanata* and *trilobata*, spp. nn., localities unknown, figs. 11 & 14.

Bankivia (Leiopyrga) picturata (H. & A. Ad.), S. Australia and Port Jackson; E. A. Smith, Zool. Coll. Alert, p. 73, pl. vi. fig. c.

HALIOTIDÆ.

Pleurotomaria. 4 species; Sowerby, Thesaur. Conch. pts. 41 & 42, pp. 183-185, pls. cccxcxi. & cccxcxii.

Schismope beddomei and *pulchra*, spp. nn., Petterd, J. of Conch. iv. p. 139, Tasmania.

Haliotis. Anatomical description by H. Wegmann, C.R. xeviii. pp. 1387-1389 [vide *suprà*, p. 13].

FISSURELLIDÆ.

Fissurella costaria (Defr.) var. n. *tilla*, *F. miriga* and *mondelloensis*, sp. nn., the latter near *nubecula* (L.), Mediterranean, and notes on other Mediterranean and allied fossil forms; Gregorio, Bull. Soc. mal. Ital. x. pp. 219-225.

DOCOGLOSSA.

ACMÆIDÆ.

Acmaea cingulata, sp. n., New Zealand, Hutton, Tr. N. Z. Inst. xvi. p. 215, radula, pl. xi. fig. 5.

PATELLIDÆ.

Patella ferruginea (Gmel.) var. n. *sitta*, from Lampedusa, and var. n. *imperatoria*, *P. lampedusensis*, sp. n., *P. vulgata* (L.); including *cerulea* (L.) and *lusitanica* (Gmel.), with varr. un. *comina*, *depressaaspera*, *nacrina*, *albula*, and *cimbulata*, all from the Mediterranean; Gregorio, Bull. Soc. mal. Ital. x. pp. 120-122.

CHITONIDÆ.

23 new species described by A. T. de Rochebrune, Bull. Soc. Philom. (7) viii. pp. 32-39.

Chiton (*Ischnochiton*) *curtisanus*, sp. n., Port Curtis, (*Callistochiton*) *coppingeri*, sp. n., Port Jackson, (*Macandrellus*) *costatus* (H. Ad.), and (*Acanthochiton*) *asbestoides* (Carp., MS), sp. n., Bass's Straits and Queensland, and notes on some other species; E. A. Smith, Zool. Coll. Alert, pp. 78-84, pl. vi. figs. d-g. *C. (Chitonellus) striatus* (Lam.), varieties and synonymy, and *burrowi*, new name for *larvæformis* (Reeve, nec Burrow, which is = *fasciatus* of Lam.) ; *id. t. c.* pp. 83-85.

TECTIBRANCHIA.

ACTÆONIDÆ.

Ringicula nitida (Verr.) = *leptochila* (Brugnone); Jeffreys, Rep. Brit. Ass. 1884, p. 553.

BULLIDÆ.

Bulla crebristriata, sp. n., *id. J. G. Soc.* xi. p. 322, pl. xv. fig. 6, Basement clay, Bridlington.

Utriculus constrictus, sp. n., *id. t. c.* p. 321, pl. xv. fig. 5, same locality.

Philine quadrata (Wood). Young specimen from Limfjord; Collin, Limfjordens mar. fauna, p. 45, pl. i. fig. 16.

Doritium marmoratum [name preoccupied by Risso, 1826], sp. n., E. A. Smith, Zool. Coll. Alert, p. 87, pl. vi. fig. f, Torres Straits.

APLYSIIDÆ.

Aplysia limacina (L., ed. 10), the species figured by Rondelet, = *fasciata* (Poiret) = *lepus* (Risso) = *camelus* and *alba* (Cuv.); *A. depilans* (L.) = *vulgaris* (Blainv.) = *l-porina* (Delle Chiaje); *A. punctata* (Cuv.) = *depilans* (Pennant, nec Linn.) = *cuvieri* (Delle Chiaje); all observed at Naples; the form of the shell is rather variable in the same species; Blochmann, MT. z. Stat. Neap. v. pp. 28-49, pl. iii. (radula, gills, and glands) [abstr. in J. R. Mic. Soc. (2) iv. p. 550]. *A. sparsinotata* and *piperata*, Torres Straits, and *denisoni*, Port Denison, spp. nn., E. A. Smith, Zool. Coll. Alert, p. 89.

Stylocheilus sp. from Torres Straits; *id. t. c.* p. 90.

PLEUROBRANCHIIDÆ.

Pleurobranchus angasi, sp. n., E. A. Smith, *t. c.* p. 88, pl. vi. fig. k, Port Jackson.

NUDIBRANCHIA.

DORIDIDÆ.

R. BERGH divides the *Dorididæ* as follows:—

I. Cryptobranchiate *Dorididæ*, with retractile gills. [*Dorididæ* proper.]

II. Phanerobranchiate *Dorididæ*. Gills not retractile; radula with one or several large lateral plates, and one or several or many external plates; terminal part of the vas deferens beset with hooklets.

(A) Suctorial forms: *Goniodoridæ*.

(B) Non-suctorial: *Polyceridæ*.

and he makes out a phylogenetic pedigree of them, ascending from *Staurodoris* in two parallel stems, the first beginning with *Notodoris*, and ascending by *Polycera* to *Euplocamus*, which is, according to him, the highest developed of all; the other beginning with *Akidoris* and ascending by *Goniodoris* to *Drepania*. *Verh. z.-b. Wien*, xxxiii. pp. 152–154.

Albania (Collingwood, 1881) = *Aethodoris* (Abraham, 1877); Bergh, in *Semper*, ii. 2, pt. 15. p. 148.

Platydoris (Bergh). Generic character; list of 23 known species; *P. eurychlamys* (Bergh), Philippines and Tongatabu: Bergh, *Zool. Challeng.* x. pp. 94–105, pls. ii. figs. 18–24, & iii. figs. 1–12. *P. argo* (L.): observations on the living animal at Naples; it casts away pieces of the mantle if irritated; spawn and internal parts described by Bergh, in *Semper*, ii. 2, pt. 15, pp. 678–682, pl.

Doris (*Platydoris*) *infrapicta*, sp. n., E. A. Smith, *Zool. Coll. Alert*, p. 91, Queensland.

Archidoris (Bergh). Generic description; list of 5 species; *A. kerguelensis* and *australis*, spp. nn., both Kerguelen, 25 and 95 fath., anatomically described: Bergh, *Zool. Challeng.* x. pp. 84–91, pls. i. figs. 1–15, & ii. fig. 13. *A. tuberculata* (Cuv.) from Naples: living animal and internal parts described; *id.* *Semper*, ii. 2, pt. 15, pp. 651–654, pl. lxix. fig. 1.

Discodoris (Bergh). Generic character; list of 15 known species; *D. morpheæ* (Bergh), Philippines, anatomically described: *id.* *Zool. Challeng.* x. pp. 92–98, pls. i. figs. 19–22, ii. figs. 1–12, & iii. fig. 13. *D. maculosa*, sp. n., Naples, and ? *erubescens*, sp. n., Trieste, *id.* *Semper*, ii. 2, pt. 15, pp. 655–665, pl. lxix. figs. 8–28.

Staurodoris bicolor, sp. n., *id.* *t. c.* pp. 655–657, pl. lxix. figs. 2–7, Trieste.

Iorunna johnstoni (A. H.), Trieste and Naples. Anatomical description; *id.* *t. c.* p. 683, pl. lxx. figs. 21–23.

Paradoris, g. n. Corpus depressum, dorso minute granulato; tenta-

cula digitiformia, infra canaliculata; branchia e foliolis paucis (6) tripinnatis formata; armatura labialis e baculis confertis formata; radula rhachide nuda, pleuris multidentatis, dentibus hamatis; penis inermis; bursæ præputiales spiculigeræ complures. *P. granulata*, sp. n., Trieste, with a variety. Bergh, *t. c.* pp. 686–693, pl. lxxvi. figs. 10–32.

Thordisa clandestina, sp. n., Torres Strait, anatomically described; *id.* Zool. Challeng. x, pp. 106–108, pl. iii. figs. 21–25. *T. ? pallida*, sp. n., *id.* in Semper, ii. 2, pt. 15, pp. 666–670, pl. lxxix. figs. 29–34, Trieste and Naples.

Baptodoris, g. n. Corpus subdepressum, sat molle, supra læviusculum, minutissime granulatum; tentacula conica; branchia paucifoliata, foliolis bipinnatis; armatura labialis nulla; lingua rhachide nuda, pleuris multidentatis; dentes hastati, externi pectinati; prostata magna; penis hamulis armatus. *B. cinnabarina*, sp. n., Trieste, 2–3 cm. long; the spawn described. *Id.*, in Semper, ii. 2, pt. 15, pp. 671–677, pls. lxxix. figs. 35 & 36, & lxx. figs. 1–19.

Bathydoris, g. n. Body semiglobular; gill composed of several separate branched tufts: back everywhere covered with soft conical papillæ; no frontal appendage; the dorsal margin very slightly pronounced. "Appears to form a very remarkable connecting link between the *Tritoniidae* and the *Dorididae*, with which latter group it agrees in possessing a blood gland." *B. abyssorum*, sp. n., Mid-Pacific, lat. 0° 33' S., long. 151° W., 2425 fath.; gelatinous and transparent, tentacles brown, gills orange, foot dark purple, length 12 cm., no eyes or otocysts. Anatomical description, *id.* Zool. Challeng. x. pp. 109–116, pls. xii. figs. 14–20, xiii. figs. 1–25, & xiv. figs. 1–13.

Chromodoris. Generic description and list of 95 species: *C. striatella* (Bergh), Philippines, Torres Strait, and Port Denison, and *runcinata* (Bergh), Port Jackson, anatomy described; *id.* *t. c.* pp. 64–78, pl. iii. figs. 26–29, iv. figs. 1–4, & vi. figs. 1–4. *C. crossei* (Angas), Australia, described, and notes on Cunningham's species, 1881; *id.*, in Semper, ii. 2, pt. 15, pp. 647–650.

Ceratosoma. Generic description, list of 8 species; *C. cornigerum* (A. Ad.) variety ?, anatomically described; *id.* Zool. Challeng. x. pp. 79–84, pl. ii. figs. 14–17, & iii. figs. 14–20.

DORIOPSIDÆ.

Doriopsis (Pease). Generic character; list of 54 known species; *D. nebulosa* (Pease ?), Sandwich Islands, anatomically described: *id.* *t. c.* pp. 117–126, pls. iv. figs. 5 & 6, & v. figs. 28–31.

Doriopsis denisoni (Angas) = *gemmacea* (Ald. & Hanc.). Alcohol specimen described; *id.*, in Semper, ii., 2, pt. 15, pp. 694–697.

GONIODORIDÆ.

The *Goniodoridæ* belong chiefly to the northern seas, and contain the following genera:—*Akiodoris* (Bergh) 1, *Doridunculus* (G. O. Sars) 1, *Acanthodoris* (Gray) 8, *Adalaria* (Bergh) 5, *Lamellidoris* (A. H.) 20,

Calycidoris (Abr.) 1, *Goniodoris* (Forb.) 8, *Idalia* (Leuck.), including *Idaliella* (Bergh) 8, *Ancula* (Loven), and *Drepania* (Lafont) 2 species; Bergh, Verh. z.-b. Wien, xxxiii. pp. 167-175.

Lamellidoris bilamellata (L.) var. *liturata* (Beck), Greenland, anatomically described; *id. t. c.* pp. 150 & 151, pl. vii. figs. 11-17.

Goniodoris castanea (A. H.). Anatomical notes; *id. t. c.* p. 151, pl. x. fig. 10.

POLY CERIDÆ.

R. BERGH gives a new definition [vide *suprà*, p. 57] and general description of this family, and enumerates the known genera and species as follows:—*Notodoris* (Bergh) 1 sp., *Triopella* (G. O. Sars) 1, *Ægires* (Loven) 3, *Triopa* (Johnst.) 5, *Issa* (Bergh) 2, *Triopha* (Bergh) 2, *Crimora* (A. H.) 1, *Thecacera* (Flem.) 4, *Polycerella* (Verr.) 1, *Palio* (Gray) 6, *Polycera* (Cuv.) 5, *Ohola*, g. n., 1, *Trevelyana* (Kel.), 11, *Nembrotha* (Bergh) 7, *Euplocamus* (Phil.) 3, *Plocamophorus* (Leuck.) 8, and *Kalinga* (A. H.) 1 sp.; Verh. z.-b. Wien, xxxiii. pp. 155-166.

Polycera and *Ægires*. Buccal parts described; *id. t. c.* p. 135, pl. x. figs. 11 & 12.

Polycerella emertoni (Verrill), fully described; *id. t. c.* p. 137-139, pls. viii. figs. 8-19, & ix. figs. 1-6.

Ohola. Near *Polycera*; but frontal margin without prolongations; gill with only three simple tufts; on the dorsal margin of each side two huge papillæ; upper tentacles sheathed, with perfoliated club; no lower tentacles; radula and armature of the penis as in *Polycera*. *O. pacifica*, sp. n., Arafura Sea, anatomically described. *Id.* Zool. Challeng. x. p. 52, pl. ix. figs. 9-22, and Verh. z.-b. Wien, xxxiii. p. 136.

Trevelyana alba (Bergh) var. n. *pallida*, from Amboina, anatomically described; *id. t. c.* pp. 139-142, pls. vi. figs. 11 & 12, vii. figs. 9 & 10, viii. figs. 2-8, & ix. figs. 12 & 13.

Euplocamus (Phil.). Generic note; *E. pacificus*, sp. n., near Kermadec Islands, anatomically described, only two lateral teeth in the radula; *id.* Zool. Challeng. x. pp. 56-64, pls. iii. fig. 30, & iv. figs. 7-24. *E. croceus* (Phil.): anatomical description by the same; Verh. z.-b. Wien. xxxiii. pp. 144-149, pls. vi. fig. 10, & x. figs. 8 & 9.

Plocamophorus insignis, sp. n., E. A. Smith, Zool. Coll. Alert, p. 91, pl. vi, fig. f, S. Australia. *P. imperialis* (Angas) = ? *navatus* (Abraham), from Sydney; external and anatomical description by Bergh, Verh. z.-b. Wien, xxxiii. pp. 144-149, pls. vi. fig. 10, & x. figs. 8 & 9.

TRITONIIDÆ.

R. BERGH gives a general description of this family, and an enumeration of the known genera and species, in Semper, ii. 2, pt. 15, pp. 699-704, and Zool. Challeng. x. pp. 43-45, as follows:—

Tritonia (Cuv.). No armature in the stomach.

Subg. *Tritonia* proper. Frontal veil papillate, lateral teeth of the radula numerous. 9 species.

Subg. *Candiella* (Gray) = *Nemocephala* (Costa). Frontal veil digitate, lateral teeth of the radula not numerous. 5 species; type, *T. plebeja* (Johnst.).

Marionia (Vayss.). Stomach armed with teeth. 11 ? species.

Hancockia (Gosse, 1877). 1 sp.

Tritonia hombergii (Cuv.), from the coast of Denmark, and notes on some other species; Bergh, in Semper, ii., 2, pt. 15, pp. 705-727, pls. lxxii. figs. 1-24, lxxiii. figs. 1-30, lxxiv. figs. 1-4, & lxxv. fig. 1.

Tritonia challengeriana, sp. n., off the coast of Patagonia, 175 fath. Anatomical description; *id.* Zool. Challeng. x. pp. 45-47, pls. xi. figs. 16-19, & xii. figs. 1-8.

Tritonia (*Candiella*) *plebeja* (Johnst.), Coast of Denmark, *lineata* (A. H.), from Lamlash Bay, anatomically described, *mæsta*, sp. n., Trieste, *id.*, in Semper, ii. 2, pt. 15, pp. 728-736, pls. lxx. figs. 24-41, lxxi. figs. 17-23, lxxii. fig. 25, lxxiv. figs. 21-24, & lxxvi. figs. 1-5.

Marionia quadrilatera (Schultz), Naples, full anatomical description, *affinis*, sp. n., Naples, *thethydea* (Della Chiaje), and *blainvillea* (Risso), anatomical notes, and *occidentalis* (Bergh), from Buenos Ayres, ? = *Tritonia cucullata* (Gould), note; *id.* t. c. pp. 737-754, pls. lxx. fig. 42, lxxi. figs. 1-16, lxxiii. figs. 31 & 32, lxxiv. figs. 7-20, & lxxv. figs. 2-21. *M. occidentalis*, sp. n., Bay of Buenos Ayres, 13 fath., anatomically described; *id.* Zool. Challeng. x. p. 49, pl. xi. figs. 5-15.

MELIBEIDÆ.

Scyllæa. Generic description, list of 9 known species, the first with several varieties, and anatomical notes on *S. pelagica* (L.); *id.* t. c. pp. 31-34, pl. xi. fig. 26.

Melibe (Rang.) = *Chioræa* (Gould). Characters of the genus, list of known species, and special description of *M. papillosa* (Filippi), from Japan; jaws present also in this species. *Id.* Z. wiss. Zool. xli. pp. 142-154, pl. x.

DENDRONOTIDÆ.

Bornella (Gray). Generic description and list of 9 species; *B. excepta*, sp. n., Arafura Sea, anatomically described. *Id.* Zool. Challeng. x. pp. 34-43, pls. vii. figs. 13-22, & viii. figs. 1-13.

Bornella digitata (A. & Rv.), Port Denison. Variability; E. A. Smith, Zool. Coll. Alert, p. 92.

ÆOLIDIDÆ.

Æolis leptosoma, sp. n., New Zealand, Hutton, Tr. N. Z. Inst. xvi. p. 231; radula, pl. xi. fig. 2.

Facelina drummondi (Thoms.), ? from Limfjord, radula; Collin, Limfjordens mar. fauna, p. 52, pl. i. fig. 15.

Cuthonella, g. n. Near *Cratena* and *Cuthona*. Anus dorsal, only slightly lateral; dorsal papillæ not inflated, set in transverse or oblique rows,

without (?) cnidophorus bags. Mandibles short, strongly denticulate; a single series of largish teeth with a denticulate cutting edge on the radula. Penis unarmed. *C. abyssicola*, sp. n., N. Atlantic, 60° N. lat., 6° W. long., 608 fath. Bergh, Zool. Challeng. x. pp. 23-26, pls. x. figs. 1-3, xi. fig. 2, & xii. figs. 9-13.

Rizzolia australis, sp. n., Port Jackson, 2-10 fath., anatomically described; *id. t. c.* p. 27, pl. ix. figs. 1-5.

Glaucus (Forst.). Historical and descriptive note on the genus; list of the 7 known species, and anatomical description of *G. atlanticus* (Forst.); *id. t. c.* pp. 10-18, pl. xiv. fig. 16. All the specimens dissected by the author were infested by *Distoma glauci* (Bergh).

Janolus, g. n. Near *Janus*. Mandibles enormously developed, their masticatory edge not denticulated; a broad foot-brim. *J. australis*, sp. n., Arafura Sea. Also, the internal parts described; they agree essentially with those of *Janus*. *Id. t. c.* pp. 18-23, pls. viii. figs. 15-22, & ix. figs. 6-8. ["*Janulus*" preoccupied in the *Pulmonata*.—REC.]

HERMÆIDÆ.

Fiona (A. & H.). General note on the genus, and anatomical description of *F. marina* (Forsk.), from the surface of the N.W. Pacific; *id. t. c.* pp. 8-10, pl. xi. fig. 1.

PHYLLIROIDÆ.

General description of this family and list of the known genera and species, *Phylliroe*, 1 sp., and *Acura* (H. & A. Ad.), 2 spp.; anatomical description of *P. atlantica* (Bergh) and *Acura pelagica* (H. & A. Ad.): *id. t. c.* pp. 3-7, pl. x. fig. 4.

PULMONATA.

W. G. BINNEY has collected his numerous descriptions and figures of the jaw and radula of various *Pulmonata*, scattered through different periodicals since 1856, with a short introduction referring to the general arrangement and terminology of the teeth. He arranges the genera or subgenera, the jaw or radula of which, in most cases both, are here described, and mostly also figured, as follows:—

Agnatha: *Chlamydophorus*, *Glandina*, *Gonospira*, *Ennea*, *Spiraxis*, *Rhytida*, *Onchidium*.

Holognatha Vitreina: *Stenopus*, *Limax*, *Urocyclus*, *Nanina*, *Velifera*, *Macrocyclus*, *Zonites*, *Janulus*.

Holognatha Helicea.

(A.)¹ Jaw ribless: *Tebennophorus*, *Sagda*, *Endodonta*, *Patula*, *Polymita* (*muscarum* and *picta*), *Hemitrochus* (*varians*, *trosceli*, &c.), *Acavus*, *Caracolus*, *Leucochroa*, *Ochtheiphila*, *Cysticopsis*, *Plagioptycha*, *Leptoloma*, *Achatinella* [vide *infra*], *Tornatellina*, *Clausilia* (*tridens*), *Stenogyra*, *Strophia*, *Cionella*, *Cæcilianella*, *Lithotis*, *Limicolaria*.

- (B) Jaw with decided stout ribs: *Anadenus*, *Carelia*, *Geomalacus*, *Veronicella*, *Simpulopsis*, *Cryptostrakon*, *Microphysa*, *Fruticicola* (*pubescens*), *Dorcasia* (*similaris* and *globulus*), *Turricula*, *Coryda*, *Plebecula*, *Leptaxis*, *Pomatia* (*sieboldiana*), *Thelidomus*, *Eurycratera*, *Polydotes* (no jaw examined), *Stylodon*, *Dentellaria* (jaw with or without ribs), 11 sp., *Pleurodonta*, *Merope*, *Cochlostyla*, *Bulimus* (including *Macrodotes*, *Pelecycilius*, *Anthinus*, *Pachyotus*, *Orphnus*, and *Dryptus*).
- (C) Jaw with separate delicate ribs, usually running obliquely towards the centre: *Gæotis*, *Amphibulima*, 4 spp., *Bulimulus*, 26 spp. (including *Drymæus*, *Liostracus*, *Mesembrinus*, *Thaumastus*, *Mormus*, *Scutalus*, *Leptomerus*, *Rhinus*, and *Plectostylus*), *Cylindrella*, *Macroceramus*, *Pineria*, *Partula*.

Elasmognatha: *Omalonyx*, *Succinea*.

Goniognatha: *Orthalicus*, *Lignus*.

Ann. N. York Ac. iii. pp. 79-136, pls. ii.-xvii.

F. W. HUTTON [title, *suprà*, p. 6] also arranges the *Stylommatophora*, with special regard to the New Zealand shells, as follows:—

Sect. 1—*Goniognatha*: jaw of several plates; gen. *Carthæa*.

Sect. 2—*Holognatha*: jaw of a single piece.

Sub-sect.—*Aulacognatha*: marginal teeth quadrate.

Fam.—*Helicidæ*: without mucous gland.

Sub-fam.—*Buliminæ*: *Placostylus*, *Tornatellina*.

Pupinæ: *Pupa*.

Helicinæ: *Patula*, *Thera*, *Rhagoda*, *Fruticicola*, *Microphysa*, *Strobila*, *Endodonta*, *Phrixgnathus*, *Amphidoxa*, *Otoconcha*.

Fam.—*Charopidæ*: with mucous gland; *Gerontia*, *Pyrroha*, *Charopa*, *Psyra*, *Therasia*, *Thulassia*.

Sub-sect.—*Oxygnatha*: marginal teeth aculeate.

Fam.—*Vitrinidæ*: heliciform, no caudal mucous gland; *Trochomorpha*, *Vitrina*.

Limacidæ: limaciform, no mucous gland; *Limax*.

Zonitidæ: heliciform, a caudal mucous gland; *Hyalina*, *Phacussa*.

Sect. 3—*Elasmognatha*: jaw with a posterior accessory plate.

Fam.—*Janellidæ*: *Janella*.

Sect. 4—*Agnatha*: no jaw; teeth all aculeate.

Fam.—*Streptaxidæ*: heliciform, no mucous gland; *Streptaxis*, *Paryphanta*, *Elea*, *Rhytida*.

Testacellidæ: limaciform, no mucous gland.

AGNATHA.

Glandina pulcherrima, sp. n., = *monilifera* var. *B* (Strebel): Strebel, Verh. Ver. Hamb. v. 1882, p. 104, Mexico.

Emea porrecta, sp. n., S.E. Borneo, allied to *Diaphera* (Alb.); V. Martens, SB. nat. FF. 1884, p. 198.

Streptaxis pachychilus, sp. n., Möllendorff, Nachr. mal. Ges. 1884, p. 171, China, prov. Kuangsi.

Streptaxis, subgg. nn. *Lamelliger*, for *S. troberti* (Petit), and *Oophana*, for *S. bulbulus* (Morel) and *mic Chaui* (Crosse); Ancey, Le Nat. 1884, No. 64, p. 508.

[*Rhytida*] *Helix greenwoodi* (Pfr.), *R. australis* (Hutt.), *citrina* (Hutt.), *patula* (Hutt.): jaw none, rows of teeth forming an acute angle; Hutton, Tr. N. Z. Inst. xvi. p. 167, pl. x. figs. *p-s*. List of New Zealand species; *id. t. c. p.* 208.

Paryphanta (Alb.). Only *busbyi* (Gray), *hochstetteri* (Pfr.), and *milligani* (Pfr.) left in this genus; Hutton, Tr. N. Z. Inst. xvi. p. 207.

Elaea, g. n. Shell small, epidermis thin, not involving the peristome, umbilicus wide, whorls few, rapidly increasing. *E. coresia* (Gray, *Helix*) and *jeffreysiana* (Pfr., *Helix*); Hutton, *t. c.* pp. 207 & 208: no jaw, rows of the radula forming an obtuse angle; *id. t. c.* pp. 171 & 172 (*Paryphanta*), pls. x. fig. *b*, & ix. figs. *e-g*.

OXYGNATHA.

Limax, *Agriolimax*, and *Amalia*. Anatomical and descriptive notes; H. Simroth, Nachr. mal. Ges. 1884, pp. 52-59.

Limax cinereoniger (Wolf.) and *cinereus* (List.): varieties from Mont Cenis and Susa; Böttger, Nachr. mal. Ges. 1884, pp. 42 & 43. *L. schwabi* (Frnfld.) distinct from *transylvanicus* (Heynem.); Hazay, Mal. Bl. (2) vii. pp. 61-64. *L. flavus* var. n. *griseus*, Roebuck, J. of Conch. iv. p. 223, Bath. *L. millepunctatus*, sp. n., Pini, Atti Soc. Ital. xxvii. p. 23, Liguria and Lombardy. *L. (Agriolimax) panormitanus* (Less. & Poll.) var. n. *ponsonbyi*, Hesse, Mal. Bl. (2) vii. p. 12, Gibraltar. *L. sanatorinus*, sp. n., Letourneux, Bull. Soc. mal. Fr. i. p. 289, Santorin Island.

Heynemannia cerulans var. n. *interrupta*, and *Lehmanni cerulans*, sp. n., Kimakowicz, Verh. siebenb. Ver. xxxiv., Transsylvania.

Aspidoporus (Fitzinger, 1833) founded on an abnormal specimen of *Amalia*; Heynemann, JB. mal. Ges. xi. pp. 1-3.

Paralimax varius, sp. n., Böttger, Ber. senck. Ges. 1884, p. 147, Abchasia.

Amalia cretica, Crete, and *robici*, Carniolia, spp. nn., Simroth, Nachr. mal. Ges. 1884, pp. 58 & 59.

Amalia, sp. n.?, from Tangiers, Hesse, Mal. Bl. (2) vii. p. 13.

Pseudomilax retowskii, sp. n., Böttger, Ber. senck. Ges. 1884, p. 146, Abchasia.

Urocyclus kirkii (Gray): character emended, type figured. To this genus belongs also *Parmarion flavescens* (Keferstein), also from E. Africa. *Aspidoporus fuscatus* (Martens, 1879) = *U. flavescens* (Gibbons, J. of Conch. 1879, p. 138, nec Keferstein) = *U. kirkii* (Binney, 1879), belongs probably to a new genus; *U. longicauda* (Fischer) = *Elisa bella* (Heynem.). Heynemann, JB. mal. Ges. xi. pp. 3-14, pl. i. figs. 1-5 & 7.

Dendrolimax (Dohrn) distinguished by a very strong keel from *Urocyclus*; *U. buchholzi* (Martens, 1876) belongs probably to this genus. *Id. t. c. p.* 12, 14, & 15.

Parmacochlea, g. n. Near *Parmarion*. Shell concealed beneath the mantle, flattened, oblong, the nuclear portion in the form of a minute *Sigaretus*-like shell projecting from beneath. *P. fischeri*, sp. n., Cape York, Australia. E. A. Smith, P. Z. S. 1884, p. 273, pl. xxiii. fig. 15.

Parmacella valenciennesi (W. B.), from Gibraltar and Tangiers, anatomically described; P. Hesse, Mal. Bl. (2) vii. pp. 9-11.

Vitrina. The Piedmontese species reviewed and the following described as new: *gaotiformis*, sp. n., heights of 2,000 met.; *nivalis* (Charp.) var. n. *piniana*; *villæ*, *pegorari*, and *stabilei*, spp. nn.; *major* var. n. *blanci*; and *pellucida* var. n. *bellardi*. Pollonera, Atti Acc. Tor. xix. pp. 412-432, 1 pl.

Vitrina (*Semilimax*) *truncata* and (*Helicolimax*) *carniolica*, spp. nn., Böttger, Nachr. mal. Ges. 1884, p. 184, Carniolia; *V. perobliqua*, sp. n., Innes, Bull. Soc. mal. Fr. i. p. 103, Abyssinia.

Microcystis stenomphala, sp. n., Möllendorff, Nachr. mal. Ges. 1884, p. 172, Hong Kong.

Macrochlamys (?) *discus*, sp. n., *id. t. c.* p. 171, Hong Kong.

Nanina (?) *infantilis* (Gredl., 1881, as *Helix similaris* var.), Kiangsi and Hunan; teeth of the radula in oblique rows, strangely flabelliform, somewhat like those of *Cylindrella*: Gredler, JB. mal. Ges. xi. p. 143, pl. iii. fig. 2. Radula described by Bachmaun & Schacko, *t. c.* pp. 157-161, pl. iii. figs. 7-10. *N. citrina* (L.), varieties from Amboina and Kê Islands: E. A. Smith, P. Z. S. 1884, p. 259.

Ariophanta taiwanica, sp. n., Möllendorff, Nachr. mal. Ges. 1884, p. 173, Formosa.

Helix (*Hemiplecta*?) *infrastrata* and *cartereti*, spp. nn., E. A. Smith, P. Z. S. 1884, pp. 264 & 265, pl. xxii. figs. 4 & 5, Admiralty Islands.

Trochomorpha ? *hermia*, sp. n., Hutton, Tr. N. Z. Inst. xvi. pp. 183 & 205, New Zealand.

[*Trochomorpha*] *Helix parviei*, sp. n., Morlet, J. de Conch. xxxii. p. 386, pl. xi. fig. 1, Kampot, Cambodia.

Situla bilirata, sp. n., Gredler, JB. mal. Ges. xi. p. 141, pl. iii. fig. 1, Kiangsi.

Kaliella polygyra and *monticola*, spp. nn., Möllendorff, Nachr. mal. Ges. 1884, p. 172, Province of Canton.

Phacussa, g. n. Shell depressed; periphery rounded; whorls 5 and 6 gradually increasing; mantle included; jaw with flat ribs; marginal teeth of the radula aculeate. *P. hypopolia* (Pfr., *Helix*), *helmsi*, and *fulminata* (Hutt.), New Zealand. Hutton, Tr. N. Z. Inst. xvi. pp. 172, 173, 205, & 206, jaw, pl. xi. fig. w, radula, pl. x. figs. i & j.

Zonites græcus (Kobelt, as var. of *verticillus*): jaw and radula by P. Hesse, JB. mal. Ges. xi. pp. 229-232, pls. iv. fig. 3, & v. fig. 1. *Z. algirus* (L.): full anatomical description, comparative with some species of *Helix* and *Limax*, by A. Nalepa, SB. Ak. Wien, 1883, pp. 237-302. (abstract) by Jickeli in JB. mal. Ges. xi. pp. 391-397).

Hyalina egopinoides (Maltz.) and *aquata* (Mouss.). Jaw and radula by P. Hesse, JB. mal. Ges. xi. p. 227, pl. iv. figs. 1 & 2.

[*Hyalina*] *Zonites parisiacus* (Mab.) and *subnitens* (Bourg.); Baudon, J. de Conch. xxxii. pp. 224 & 227, pl. ix. figs. 6 & 7. Differences between

the English *Z. purus* (Alder) and the French *nitidosus* (Fer.); Baudon, *t. c.* p. 229.

Hyalinia mauriceti (Bourg., MS.), Deps. Morbihan and Vendée, and *hypogæa* (Bourg., MS.), Hyères, S. France, near *pseudohydatina*, spp. nn., Ancey, Bull. Soc. mal. Fr. i. pp. 157 & 158. *H. obscurata* (Porro) = *porroi* (Paulucci), from Genoa, with var. *shuttleworthiana* from Corsica; distinct from *antoniana* (Paulucci) and *blaueneri* (Shuttl.): N. Pini, Atti Soc. Ital. xxvi. pp. 389-404. *H. westerlundii*, sp. n., Cafici, Nat. Sicil. ii. p. 2, pl. i. fig. 1, Sicily. *H. diaphana* var. n. *lessona*; Pini, Atti Soc. Ital. xxvii. p. 21, Piedmont.

Helix [*Hyalinia*] *exulata*, sp. n., E. A. Smith, P. Z. S. 1884, p. 278, Tristan d'Acunha.

AULACOGNATHA.

Arion. Anatomical and descriptive notes on the European species, by H. Simroth, Nachr. mal. Ges. 1884, pp. 59-61; even the large *A. empiricorum* is believed to become adult within one year.

Arion. Heynemann repeats his assertion that *Letourneuxia* (Bourg.) is not distinct from this genus, and enumerates the differences between *Arion* and *Geomalacus*; Nachr. mal. Ges. 1884, pp. 178-180. *A. ater* var. *plumbea*; Roebuck, J. of Conch. iv. p. 146, Poole. *A. fuscus* var. n. *zettergeri*; Pollonera, Abh. Ver. Brem. ix. 1, p. 59, with figures, Bremen. *A. mabillianus* = *Geomalacus mabillei* (Baudon, 1868), Dep. Oise; Baudon, J. de Conch. xxxii. p. 200; figures of the teeth, by Lessona, *t. c.* pl. x. fig. 1. *A. (Ariunculus) moreleti*, sp. n., Hesse, Mal. Bl. (2) vii. p. 14, Tangiers.

Philomycus bilineatus (Bens.), varieties; E. A. Smith, P. Z. S. 1884, p. 259.

Binneyia notabilis common at Guadaloupe Island, Coast of California; it envelopes itself in summer with a calcareous cover: Dunn, Science, No. 88, and Nachr. mal. Ges. 1884, p. 189.

Thalassia (?) *propinqua* (Hutt.): jaw and radula; Hutton, Tr. N. Z. Inst. xvi. p. 109, pls. x. fig. g, & xi. fig. v. *T. portia* (Gray, *Helix*) = *kappa* (Pfr.) = *collyrata* (Rv.); *obnubila* (Rv.) = *igniflua* (Rv.) and *antipoda* (H. J.): jaw and radula, pp. 163 (*Patula*), 168 & 169 (*Helix*), pls. ix. fig. t, & x. figs. e & f. List of New Zealand species; *id. t. c.* p. 203.

Helix (*Thalassia*) *traversi* and (*Patula*) *stokesi*, spp. nn., E. A. Smith, P. Z. S. 1884, pp. 274 & 275, pl. xxiii. figs. 16 & 17, New Zealand.

Therasia, g. n. Shell conoidal, depressed, periphery subcarinated; subperforate or narrowly perforate; whorls smooth, striated or with membranaceous plaits; jaw with flat ribs; marginal teeth broad, usually with several points. *T. celine* (Gray, *Helix*), *ophelia* and *decidua* (Pfr., *Helix*), *tamora*, *thuisa*, *valeria*, all from New Zealand. Hutton, Tr. N. Z. Inst. xvi. pp. 162, 182, 183, 202, & 203, radula, pls. ix. fig. o, & xi. fig. t & u, jaw, pl. ix. figs. m & n. Shell of *valeria*; *op. cit.* xiv. 1881, fig. b, under the name *hypopolia* (nec Pfr.).

Charopa ida (Gray, *Helix*) = ? *ziczac* (Gould), New Zealand; Hutton, Tr. N. Z. Inst. xvi. p. 201. Jaw and radula; *id. t. c.* p. 164 (*Patula*), pl. ix. fig. 21.

Psyra, g. n. Shell imperforate or narrowly umbilicated, ribbed; periphery rounded, not hairy; jaw and teeth as in *Charopa*. *P. dimorpha* (Pfr.) and *venulata* (Pfr., *Helix*), *tullia* (Gray), *cassandra*, *adriana*, *planulata*, and *miranda*, spp. nn., New Zealand. Hutton, *t. c.* pp. 201, 202, 175 (*Fruticicola*), 180 & 181 (*Charopa*), jaw and radula, pp. 161 & 165 (*Charopa*), pls. ix. fig. *u*, & xi. fig. *y*.

Pyrrha, g. n. Heliciform, mantle subcentral, reflected over the peristome with an even margin; tail truncate, with a large papilla and mucous gland; jaw with flat ribs; marginal teeth broad, with several points; shell thin, translucent, of $4\frac{1}{2}$ – $5\frac{1}{2}$ regularly increasing whorls, subperforate. *P. cressida*, sp. n., and *guttula* (Pfr., *Helix*), New Zealand. *Id. t. c.* pp. 200 & 178 (as *Pfeifferia*? *cressida*, sp. n.), radula, pl. ix. fig. *x*, jaw, pl. xi. fig. *n*.

Gerontia pantherina (Hutt.): jaw and radula; *id. t. c.* p. 166, pls. ix. fig. *f*, & xi. fig. *r*. *G. cordelia*, sp. n., *id. t. c.* p. 178. Both also p. 200.

Otoconcha, g. n. Shell external, of few rapidly increasing whorls, all of which are open underneath; animal limaciform; mantle rather anterior, covering the shell; no locomotive disc nor mucous caudal gland; jaw with distant ribs. *O. dimidiata* (Pfr., *Vitrina*), New Zealand. *Id. t. c.* p. 199. Jaw and radula; *id. t. c.* p. 166, pls. ix. fig. *y*, & xi. fig. *o*.

Amphidoza perditia, *jacquenetta*, and *lavinia*, spp. nn., New Zealand; also jaw and radula of the two former; *id. t. c.* pp. 179 & 180, pls. *x*. fig. *c*, & xi. figs. *c* & *q*. Jaw and radula of *zebra* (Guill.) = *phlogophora* (Pfr.), *chiron* (Gray), and *crebriflammis* (Pfr.), *cornea* and *costulata* (Hutt.); *id. t. c.* pp. 170 & 171, pls. ix. fig. *z*, *x*. figs. *a*, *b*, & *d*, & xi. fig. *g*. List of New Zealand species; *id. t. c.* pp. 198 & 199.

Culymna, subg. n. of the preceding, distinguished by the ribbed whorls. For *A. costulata* and *lavinia* (Hutt.). *Id. t. c.* p. 199.

[*Patula*] *Helix flocculus* (Mor.) = *pauper* (Gould) = *raderata* var. *opulens* (West.), from Behring Island; distinct from *striatella* (Anthony): Dall, P. U. S. Nat. Mus. vii. p. 342. [*Patula*] *H. cooperi* (Binn.) viviparous; Bayay, J. de Conch. xxxii. p. 363.

Patula coma (Gray), *lucetta* (Hutt.), *buccinella* (Rv.), *anguiculus* (Rv.), *corniculum* (Rv.), *infecta* (Rv.), *tapirina* (Hutt.), all from New Zealand: jaw and radula described by F. W. Hutton, Tr. N. Z. Inst. xvi. pp. 162–165, pls. ix. figs. *c–h*, & xi. figs. *a* & *k*. *P. jessica*, *bianca*, *timandra*, and *sylvia*, spp. nn., New Zealand, *id. t. c.* pp. 174 & 175. List of the known New Zealand species; *id. t. c.* pp. 191–193.

Thera, g. n. Animal and jaw as in *Patula*; shell conical, high, perforate, hairy; periphery angulated. *T. stipulata* (Rv., *Helix*) = *barbatula* (Rv.) = *alpha* and *beta* (Pfr.), New Zealand. *Id. t. c.* p. 198. Jaw and radula; *id. t. c.* p. 168, pl. xi. figs. *b* & *l*.

Endodonta marina and *nerissa*, spp. nn., New Zealand, *id. t. c.* p. 176. *E. pæciliosticta* (Pfr., *Helix*): jaw described; *id. t. c.* pp. 168 & 195.

Strobila leioda (Hutt.): radula; *id. t. c.* pp. 166 & 195, pl. ix. fig. *p*.

Omphalosagda (Sandberg). To this originally fossil subgenus belongs also the recent *Helix tetuanensis* (Kobelt); Böttger, Nachr. mal. Ges. 1883, p. 4, and JB. Mineral. ii. 1884, p. 139.

Helix. European species:—

O. ASHFORD describes the darts of *H. ericetorum*, *caperata*, and *pisana*, J. of Conch. iv. pp. 129–133, pl. v.; of *H. nemoralis*, *hortensis*, and *fusca*, t. c. pp. 164–170, pl. vii.; of *H. arbustorum*, *lapicida*, *pulchella*, *aspera*, pp. 195–202, pl. viii.; of *H. pomatia*, *rufescens*, *hispida*, and *concinna*, pp. 239–244 [pl. ix., in the following part, issued 1885.]

[*Caracollina*?] *Helix callestha*, sp. n., Bérenguier, Bull. Soc. mal. Fr. i. p. 285, Dep. Var.

[*Gonostoma*] *Helix obvoluta* (Müll.), varieties described, *angiggyra* (Jan.) and *holoserica* (Stud.) found in Savoy; Locard, Bull. Soc. mal. Fr. i. pp. 197–202.

Helix lens (Fer.). Anatomical description by P. Hesse, JB. mal. Ges. xi. p. 233, pl. iv. fig. 5.

Helix (*Gonostoma*) *pechaudi*, sp. n., Ancey, Nat. Sicil. i. 1882, p. 294, Oran.

Anchistoma trinodis and *triadis*, spp. nn., near *triaria* (Friv.), Kimakowicz, Verh. siebenb. Ver. xxxiv., Transsylvania.

[*Fruticicola*] *Helix cantianiformis*; sp. n., Folkestone, Ancey, Bull. Soc. mal. Fr. i. p. 158.

Helix cantiana (Mout.), *martensiana* (Tiberi), *apennina* (Porro), and *olivieri* (Fer.). Anatomical descriptions by P. Hesse, JB. mal. Ges. xi. pp. 234–237, pl. v. figs. 8–11.

Bradybana (Beck) restricted to the type of *Helix strigella* (Dr.); Westerlund, Sveriges, &c., Land och Sött-vattens Mollusker, pp. 18 & 19.

Helix clessini, sp. n., Moravia: distinct from *transylvanica* (Bielz), *sericea* (Drap.), and *lubomirski* (Slos.); Ulicny, Mal. Bl. (2) vii. pp. 1–8, with woodcut. *H. tassyi*, sp. n., Bourguignat, Bull. Soc. mal. Fr. i. p. 357, Dep. Ariège; near *H. limbata* (Dr.).

Fruticicola pedemontana, sp. n., Pini, Atti Soc. Ital. xxvii. p. 19, Valley of Pesio, Piedmont.

Helix (*Fruticicola*) *stussineri*, sp. n., Böttger, Nachr. mal. Ges. 1884, p. 16, Sila Forest, Calabria.

Helix bidinensis, sp. n., Cafici, Nat. Sicil. ii. 1882, p. 3, pl. i. fig. 2, Sicily. *H.* (*Fruticicola*) *limbata* var. n. *delomphala*; Ancey, Nat. Sicil. i. 1882, p. 290, Carthagen. *H.* (*Fruticicola*) *semirugosa*, sp. n., Kobelt, Nachr. mal. Ges. 1884, p. 27, Tetuan. *H.* (*Fruticicola*) *caidis*, sp. n., and *H.* (*Trichia*) *polytrichia*, sp. n., Western Algeria, Ancey, Nat. Sicil. i. 1882, pp. 291 & 292.

Helix (*Carthusiana*) *pachnodes* and *holotricha*, spp. nn., Abchasia, and note on *carascaloides* (Bourg.); Böttger, Ber. senck. Ges. 1884, pp. 149–151.

[*Xerophila*] *Striatella*, subg. n., for *Helix striata* (Müll), Westerlund, Sveriges, &c., Land och Söttv. Moll. p. 15.

Planatella and *Striatinella*, new sections of *Xerophila*, for *H. erietorum* and *candidula*; Clessin, Deutsche Excursions-Mollusken-Fauna, pp. 187 & 193 [= *Helicella* (Moq. Tand., Kobelt) and *Candidula* (Kobelt)].

P. Fagot discusses the Italian forms allied to *striata* (Drap.), of which

he distinguishes the following:—*cisalpina* (Jan.), Rossmässler, fig. 354e, Venice, *subprofuga* (Stabile), Avellino, *phari*, new name for Rossmässler's, fig. 354b, from Trieste, *mediolanensis*, new name for Rossm. fig. 354a, from Milan, *spalatensis*, new name for Rossm. fig. 354e, from Spalato; and he describes the following as new species: *lesiniaca*, sp. n., Lesina, in Dalmatia, *brundusiana*, sp. n., Brindisi, *gradisanensis*, sp. n., Gradisca, in Istria, *tringa* (Westerlund, as var. of *profuga*), Lido of Venice, *florentina*, sp. n., Florence, *arnusiaca* [!], new name for *profuga* var. *etrusca* (Issel), Tuscany, *aprutiana*, sp. n., Monte Majella, *colosseuna*, sp. n., Coliseo, in Rome, *romana*, sp. n., Rome and Narni, *fiesolensis*, sp. n., Fiesole, near Florence. The name *H. profuga* (A. Schmidt) belongs, according to him, to the French *H. striata* of Draparnaud, a form even yet not surely recognized. The same distinguishes and describes further in the group *Spadana*, *H. spada* (Calcara) = *bathyomphala* (Pfr.), *destituta* (Charp.), and *ocellus* (Villa), all from the Abruzzi. Bull. Soc. mal. Fr. i. pp. 107-131.

Helix deana and *pleurestha*, spp. nn. (Tassy, MS.), Dep. Drôme, near *striata*; Berthier, Bull. Soc. mal. Fr. i. p. 353-356.

Helix ericetorum (Müll.) and *candicans* (Ziegl.), both in the same district numerous, but not intermingling, each confined to separate localities; Bachmann, Moll. v. Landsberg-a.-L. pp. 16 & 17.

Helix cespitum (Drap.): calcareous variety with dark animal; Salvana, R. Ac. sci. nat. Barcelona, 1883, p. 406, Igualada and Gavá, province of Barcelona.

[*Xerophila*] *Helix lauracina*, Villefranche-Lauragnais, Dep. Haute-Garonne, *carpensovactensis*, Carpentras, Dep. Vaucluse, and *visanica*, Visan, Dep. Vaucluse, spp. nn., Fagot, Diagnoses d'espèces nouvelles, pp. 3, 15, & 16. The same and *H. bollenensis* (Loc., 1882), Deps. Vaucluse and Drôme, *robiniana* (Bourg., MS.), sp. n., Deps. Alpes-Maritimes, Drôme, Vaucluse, and Basses-Alpes, *foliorum* (Fagot, MS.), Narbonne, *primohila* (Mabille, 1881), Basses-Alpes, *perroudiana*, sp. n., Deps. Vaucluse, Drôme, Basses-Alpes, and *tricastinorum* (Florence, MS.), sp. n., St. Paul Trois-Châteaux, Dep. Drôme, all near *striata* (Drap.), comparatively described, with enlarged sketches of 4 of them, by A. Locard, Ann. Soc. L. Lyon, xxxi., 28 pp., 1 pl.

Helix terveri (Mich.), from the environs of Toulon, described; *luci*, *adolia*, and *maristorum*, spp. nn., Luc, Dep. Var: F. Florence, Bull. Soc. mal. Fr. i. pp. 359-366.

Helix (Xerophila) codia (Bourg.) var. n. *rufa*; Ancey, Nat. Sicil. i. 1882, p. 293, Malaga.

Helix ingoi, *palumboi*, *melania* (Bourg., MS.), *euetha*, *philoxera*, and *licodiensis*, spp. nn., Caffici, Bull. Soc. mal. Fr. i. pp. 305-309, Sicily. *H. benoiti*, sp. n., and *H. variabilis*, varr. nn. *luctuosa* and *turbiata*, p. 176. Nat. Sicil. ii. 1882, pp. 29-32, pl. i. figs. 3-5, Sicily. *H. præclara*, *euphorca* (Bourg.) var. *minor* and *astata* (Bourg.); *id. t. c.* pp. 49-52, the two former pl. i. figs. 6 & 7.

[*Xerophila*] *Helix santorina*, *therasina*, *fouquei*, and *nomichosi*, spp. nn., Letourneux, Bull. Soc. mal. Fr. i. pp. 293-297, Santorin Island. *H. oberthueri*, Asturia, *illibatiformis*, Oran, *megastoma* (Bourg., MS.), Majorca,

euphorcopsis (Letourneux, MS.), Tunis, *eusarca*, Southern Italy, *eusarcocoma*, Minorca, *ambusta*, *combusta*, *pravalens*, *petraea*, *baria*, *lapidosa* (Bourg., MS.), *calcarina*, *ardens*, *saharica*, *ischurostoma*, and *nahrouesse-liana* (these 3, Bourg., MS.), all these from Algiers, spp. nn., Ancey, Bull. Soc. mal. Fr. i. pp. 159-172. *H. jolyi* (Pechaud, MS.), sp. n., Nemours, in Algeria, allied to *H. gargotte* (Phil.), and *daroli* (Letourneux, MS.), Prov. Constantine, Algeria, near *mograbina* (Morel.); *id.* Nat. Sicil. i. 1882, pp. 293 & 294.

[*Campylaea*] *Helic demoulini* (Farines) = *acrosticha* (Fischer), distinct from *cornea* (Drap.) by its slightly hairy periostracum; *H. crombezi* (Millière) is an analogous species found in the Alpes Maritimes, at a height of 2500 m.: Locard, Bull. Soc. mal. Fr. i. pp. 203-207.

Helix cyclolabris (Desh.): anatomical description by Hesse, JB. mal. Ges. xi. p. 242, pl. v. fig. 14. *H. sigela*, *compsopleura*, and *perfecta*, Bourguignat, Nat. Sicil. ii. 1883, pp. 213-215, Southern Tyrol; allied to *H. gobanzi* (Frauenf.). *H. hemonica*, sp. n., Thiesse, Bull. Soc. mal. Fr. i. p. 271, Kalambaka, in Thessalia.

Pseudocampylaea, subg. n. of *Helix*, for *H. lecta* and *pellita* (Fer.), *noverca* (Shuttl.), and *westerlundii* (Blanc), all from Greece. Jaw with many ribs; no glandulæ mucosæ; no dart; stalk of the receptaculum seminis without coecal appendage. List of known species from Crete or the Cyclades. Hesse, JB. mal. Ges. xi. pp. 237-244, pl. v. figs. 12 & 13.

Helix naziana (Fer.), from the islet Standia, near Candia, and *lecta* (Fer.), from the islet S. Theodoro, near Canea, Crete; H. v. Maltzan, Nachr. mal. Ges. 1884, p. 74.

[*Tachea*] *Helix nemoralis* and *hortensis* observed in copulâ; J. Salvana, R. Acad. sci. nat. Barcelona, 1883, p. 415.

[*Macularia*] *Helix chottica* and *flattersiana*, spp. nn., Prov. Oran, *hieroglyphicula* var. n. *integrivittis*, and notes concerning *H. arabica* (Terv.), distinct from *abrolena* (Bourg.), *zuffarina* (Terv.), *alabastrites* (Bourg.), and *jourdaniiana* (Bourg.); Ancey, Nat. Sicil. i. 1882, pp. 285-290.

Helix (*Macularia*) *arischensis* and *duriezi* (Debeaux, MS.), spp. nn., Kobelt, Nachr. mal. Ges. 1884, pp. 26 & 27, Prov. Oran. *H. spiriplana* (Olivier, nec auct.) = *malziana* (Parr.), from Rhodus; Maltzan, Nachr. mal. Ges. 1884, p. 73. *H. aimophila* (Bourg.): its true habitat is Biledjick, near Broussa, N.W. of Asia Minor; Crosse, J. de Conch. xxxii. pp. 325-327, pl. vii. figs. 5 & 6.

[*Macularia* and *Iberus*] *Helix ridens* and *sardonica*, spp. nn., from Sardinia, allied to *platychela* (Menke) and *scabriuscula* (Desh.), from Sicily; E. v. Martens, SB. nat. Fr. 1884, p. 179.

[*Pomatia*] *Helix pomatia* varr. nn. *cephacea* and *costellifera*; Baudon, J. de Conch. xxxii. p. 241, the latter, pl. viii. fig. 3, Dep. Aube. *H. du-coronae*, sp. n., Letourneux, Bull. Soc. mal. Fr. i. p. 290, Santorin Island.

The Italian species of the group *H. ligata* and *lucorum* (Müll.) reviewed, with description of *H. yleobia*, Basilicata, *virago* = *lucorum* var. *depressa* (Bourg.), Florence, *rypara*, Trevi, Florence, and Lake of Garda, *nigrozonata*, Pavia, Mantua, and *atrocineta*, Mantua, Pavia, Verona, spp. nn.; Bourguignat, Nat. Sicil. ii. 1883, pp. 216, 234-240, 261-266, & 293-293.

Helix aspersa var. *lutea*; Baudon, J. de Conch. xxxii. p. 239, pl. viii. fig. 2, Dep. Aube.

Helix. Asiatic species:—

Helix capusi, sp. n., Villeserre, Bull. Soc. mal. Fr. i. p. 133, Turkestan. *H. fedtschenkopsis*, *reneana*, and *desgodinsi*, spp. nn., Ancey, Ann. de Mal. i. pp. 384–386, Confines of Thibet and China. *H. trisinuata* (Martens) var. n. **sculptilis*, Lofoushan, eastwards of Canton, *huaiensis*, Provinces Schensi and Kansu, *gerlachi* (Möll.), exact localities, *applanata*, sp. n., Fudshou, Prov. Fudshien, *similaris* (Fer.), varieties in China, including *hongkongiensis*, *obscura*, *striatissima*, and *nucleus* (Desh.), *assimularis* (Gredl.), *graminum* and *arundinetorum* (Heude), *H. fortunei* (Pfr.) distinct from *similaris* also in its localities, with var. n. **meridionalis*, *schomburgiana*, new name for *trochulus* (Möll., 1882, *nec trochula*, A. Ad.), **hungerfordiana* (Nevill, MS.), sp. n., Formosa, Hong Kong, and near Canton, with var. n. *rufopila*; Von Möllendorff, JB. mal. Ges. xi. pp. 309–338 (those marked with * figured, pl. vii. figs. 4, 5, & 7).

Fruticotrochus (Kobelt) = *Satsuma* (Adams); 15 Chinese species enumerated: *id. t. c.* pp. 328–336.

Cuthaica, subg. n. of *Helix*. Distinguished from *Trachia* by the striated or coarsely ribbed, but not granulated, sculpture, and the upper part of the peristome being externally straight, not expanded, however thickened within. Type, *H. pyrrhozona* (Phil.); further, *H. middendorffi* (Gerstf.), *tihetica* (Desh.), *christinae* (H. Ad.), *przewalskii*, *plectotropis*, and *phaeozona* (Martens), *buigneri* (Desh.), and several fossil species; geographical range, the northern half of China, Eastern Siberia, and Central Asia; 35 species enumerated. *H. mercii* (Hilber) = *przewalskii* (Martens), *gredleri* (Hilber) distinct from *stoliczkanii* (Nevill), *H. subrugosa* (Desh.) figured, northern borders of China, with var. *kalganensis* (Möll.). *Id. t. c.* pp. 339–352, pl. vii. fig. 6.

Helix (*Ægista*) *pseudochinensis* = *chinensis* of Heude, pl. xv. fig. 4, and *subchinensis* (Nevill, MS.), spp. nn., distinguished from the true *chinensis* (Philippi); *id. t. c.* pp. 353–355, the second figured, pl. vii. fig. 8.

Helix (*Acusta*). Synonymy and localities of the Chinese species, *H. huberiana* (Heude) = *redfieldi* (Pfr.), and *phragmitum* (Heude) = *burtini* (Desh.); *id. t. c.* pp. 359–371.

Helix (*Obba*) *platyodon* (Pfr.), from Hainan. Jaw odontognath, shape and colour of the shell variable; *id. t. c.* p. 372, pl. viii. figs. 3–8.

Helix (*Hadra*) *cicatricosa* (Müll.), throughout the whole province of Canton, but not elsewhere in China; *hainanensis* (A. Ad.) and *xanthoderma*, sp. n., Moanshan, same province, and Hong Kong, with var. n. *polyzona*, on trees in woods, *caspari*, sp. n., southern part of Prov. Hainan, *succincta* (H. Ad.), *friesiana*, sp. n., Formosa, and *stenozona*, sp. n., Fudshien: *id. t. c.* pp. 373–387, pls. vii. figs. 1–3, viii. figs. 1 & 2, & ix. figs. 1–8.

Helix kiangsinensis var. n. *cerasina*, *trisculpta* var. n. *frater-minor*, both Prov. Hupe, and *houaiensis* var. n. *moellneri*, Tsinanfu; Gredler, JB. mal.

Ges. xi. pp. 137 & 155. *H. kiangsinsensis* (Mölland.) really spirally furrowed; Von Möllendorff, Nachr. mal. Ges. 1884, p. 103.

Helix fortunei (Pfr.) distinct from *similaris* (Fer.); Gredler, Arch. f. Nat. l. p. 262, footnote. *H. christinae* (H. Ad.): varieties and allied species; *id. t. c. p.* 264. *H. buvigneri* (Desh.): fresh state described; *id. t. c. p.* 266. *H. bizona*, sp. n., Prov. Schensi, and *squamulina*, sp. n., Prov. Hunan; *id. t. c. pp.* 267-269. *H. orithyia* (Martens): note by Ancey; Nat. Sicil. iii. p. 346.

Helix hæmastoma (L.): egg 17 mm. long and 12 broad; Auber & Bavay, J. de Conch. xxxii. p. 385.

Helix. Papuan species:—

Helix (Obba) goldiei (Brazier, 1880) = *oxystoma* (E. A. Smith, 1883), and *H. (Geotrochus) zeno* (Brazier, 1876) = *latiaxis* (E. A. Smith, 1883), New Guinea; Brazier, P. Linn. Soc. N. S. W. ix. pp. 804 & 805.

Helix (Obba) oxystoma, (*Geotrochus*) *latiaxis*, *tapparonei*, and (*Sphaerospira*) *genardi* (E. A. Smith, 1883), came from the inland of Port Moresby, and the two former are = *goldei* (Brazier, 1880) and *zeno* (Brazier, 1876); *id. t. c. pp.* 804-806.

Helix (Geotrochus) moseleyi, *labillardierei*, and (*Chloritis*) *dentrecauxi*, spp. nn., E. A. Smith, P. Z. S. 1884, pp. 263-265, pl. xxii. figs. 2, 3, & 6, Admiralty Islands. [The first belongs rather to *Cristigibba* (Tappan.), near *Planispira*.—REC.]

Helix. Australian species:—

Fruticicola adriana, sp. n., New Zealand, Hutton, Tr. N. Z. Inst. xvi. p. 175: referred to the genus *Charopa*; *id. t. c. p.* 201. *F. pilula* (Rv., *Helix*), with var. *granum* (Pfr.), New Zealand; *id. t. c. p.* 194: its jaw and radula, pp. 161 & 170, pls. ix. figs. *k* & *l*, & xi. fig. *m*.

Helix. African species:—

Helix porcaria, *scötina*, *omoia*, *thelica*, *monacha*, *cyanostoma*, *oomorpha*, *cutarella*, *polydora*, *madera*, *erythromorpha*, *lychna*, *stilpna*, and *lithida*, spp. nn., Mabille, Bull. Soc. mal. Fr. i. pp. 139-153, all from Madagascar.

Helix. North American species:—

Pæcilozonites, subg. n. of ? *Zonites* (Montf.), proposed for *Hyalinia bermudensis* (Pfr.) and the tertiary *imbricata* (A. Braun), by Sandberger, J.B. Mineral. 1884, ii. p. 139.

Helix. Sub-Antarctic species:—

Helix (Stephanoda) selkirki, sp. n., E. A. Smith, P. Z. S. 1884, p. 279, Juan Fernandez. *H. hookeri* (Rv.) var. n., radiately striped with red, from Smith's Edward's Island; *id. t. c. p.* 277.

Amphidromus hemicyclus, sp. n., Rochebrune, Bull. Soc. Philom. (7) vi. p. 117, Bangkok.

Bulinus (Amphidromus) semitesellatus, sp. n., Morlet, J. de Conch. xxxii. p. 387, pl. xi. fig. 2, Kampot, Cambodia.

Borus seneri, sp. n., Jousseaume, Bull. Soc. Z. Fr. ix. Nos. 3 & 4, p. v. p. 169, pl. iv. fig. 3, Columbia.

Bulimus lacrimosus, sp. n., near *succineoides* (Petit), Heimbürg, Nachr. mal. Ges. 1884, p. 92, *Iquitos*, on the Upper Amazon river.

Pelitia, g. n. Shape of *Limicolaria*, pillar truncated as in *Achatina*. *P. ruffrayi* (Jousseaume, *Achatina*, 1883) and *petitia*, sp. n., Congo. Jousseaume, Bull. Soc. Z. Fr. ix, pp. 171-173, the latter pl. iv, fig. 4.

Pseudachatina vitrea, new name for a species from the island of St. Thomas, not yet described; Greeff, SB. Ges. Marb. 1884, No. 2, p. 51, footnote 3.

[*Buliminus*] *Bulimus lycanianus*, sp. n., Innes, Bull. Soc. mal. Fr. i. p. 104, Abyssinia. *Buliminus exodon* (Martens, 1884) = *Pupa socotrana* (Godw. Austen, 1884); Crosse, J. de Conch. xxxii. p. 345. [*Buliminus*] *Bulimus desgodinsi*, *perrieri*, *rochebruni*, *bieti*, and *prostomus*, spp. nn., confines of Tibet and China (the three former sinistral), and enumeration of all sinistral species of *Bulimus* [*Buliminus*] in Europe and Continental Asia; Ancey, Ann. Mal. i. pp. 387-397. [*Buliminus*] *B. cantori* (Bens.) var. n. *octona*; id. Nat. Sicil. ii. p. 211, Inkiapo. *Buliminus cantori* (Phil.) varr. nn. *fragilis*, *Fudshien*, and *taivani*, Formosa; *B. albescens*, sp. n., Hong Kong: Möllendorf, JB. mal. Ges. xi. pp. 165 & 170, the last with woodcut. The last and *granulatus*, sp. n., Hainan, id. Nachr. mal. Ges. 1884, pp. 28 & 173. *B. anceyi*, sp. n., Gredler, JB. mal. Ges. xi. p. 144, Kuang-si; renamed *B. hilberi*, by the author, t. c. p. 306, the former name being preoccupied. *B. laurentianus*, sp. n., id. Arch. f. Nat. l. p. 269, pl. xix. fig. 1, Prov. Hupe, China. *B. fuchsianus* (Heude, 1882) = *rufistrigatus* var. *huanicola* (Gredl., 1882), priority doubtful; Möllendorf, Nachr. mal. Ges. 1884, p. 104. *B. misellus*, *cylindroides*, and *canescens*, new names for *minutus*, *pallens*, and *thibetanus* (Heude, all preoccupied); Heude, J. de Conch. xxxii. p. 19 [already renamed *B. pumilio*, *cadaver*, and *heudeanus*, by Ancey, 1883; see Zool. Rec. xx. Moll. p. 75].

Brephulus ghedeoni, *rivetianus*, *narcissei*, *merloianus*, and *becharianus*, spp. nn., near *tourneforti* (Fer.), and *bithynicus* and *bradus*, spp. nn., near *zebra* (Oliv.); Galland, Bull. Soc. mal. Fr. i. pp. 272-284, Northern coast of Asia Minor.

Chondrus geoffreyi, sp. n., Ancey, Nat. Sicil. iii. p. 345, Mazanderan.

Hapalus battgeri, sp. n., Gredler, Arch. f. Nat. l. p. 270, pl. xix. fig. 2, Prov. Huhan, China.

Partula layardi (Brazier) intermediate between *Partula* and *Placostylus*, and *P. radiata* (Pease, MS.) = *compressa* (Pease, neg. Pfr.), from Raiatea, described; Ancey, Nat. Sicil. iii. p. 344. *P. hartmanni*, sp. n., E. A. Smith, P. Z. S. 1884, p. 266, pl. xxii. fig. 7, Admiralty Islands.

Achatinella. Binney, having examined 24 species with regard to the radula, states that there are two types: (a) jaw very delicate, radula as described by Heynemann, "en chevron," the sections *Partula* and *Achatinella*, s. str., and also *A. auricula* (Fer.); (b) jaw stout, generally with median projection, radula long and narrow, rows not en chevron, central tooth small, tricuspid, laterals bicuspid, base of attachment quadrate, the sections *Newcombia*, *Laminella*, and *Leptachatina*. Ann. N. York Ac. iii. pp. 96-99, pls. iii. & xvi.

Perussacia subcylindrica [lubrica, Müll.] var. *collina* (Drouet), small, pale greenish; Baudon, J. de Conch. xxxii. p. 257, pl. ix. fig. 11, Dep. Oise.

Zua davidis (Ancey), China: differences from *lubrica* (Müll.) ; Gredler, Arch. f. Nat. l. p. 266.

Stenogyra carinata, sp. n., Watterbled, J. de Conch. xxxii. p. 105, pl. vi. fig. 1, Coch. China.

Stenogyra (Euspiraxis) mira, sp. n., Gredler, JB. mal. Ges. xi. p. 116, pl. iii. fig. 4, Hunan.

Stenogyra (Opeas) pellita, sp. n., id. t. c. p. 147, Hunan.

Stenogyra (Opeas) hunanensis, *kuangsiensis*, and *arctispira*, spp. nn., China, Gredler, Arch. f. Nat. l. pp. 271-273, pl. xix. figs. 3-5.

[*Stenogyra*] *Achatina monticola* (Morelet) = *subcrenata* (Greeff), juv. ; Greeff, SB. Ges. Marb. No. 2, p. 51, footnote 2.

Balfouria, subg. n. of *Stenogyra*. Distinct by the hairy periostracum. *S. hirsuta* (Godw. Aust.), from Socotra. Crosse, J. de Conch. xxxii. p. 356.

Balea. The described palæarctic species reduced to one ; Westerlund, Fauna Palæarct. iv.

Balea (Tristania) ventricosa and *tristensis* (Leach, Gray) redescribed by E. A. Smith, P. Z. S. 1884, pp. 278 & 279.

Sestertia, g. n. Shell cylindrical, dextral, many-whorled ; pillar hollow, straight above, much twisted below, forming a strong fold in the aperture. *S. gallandi*, sp. n., between Diarbekr and Mossal. Bourguignat, Bull. Soc. mal. Fr. i. pp. 135-138, pl. iii. figs. 1-5.

Clausilia 508 palæarctic species reviewed, with descriptions, by Westerlund, Fauna Palæarct. iv. *C. luminata* var. *dubiosa* (Clessin) belongs rather to *fimbriata* (Rossm.) ; Böttger, Nachr. mal. Ges. 1884, p. 11. *C. nigricans* var. n. *linearis*, with a white band ; Baudon, J. de Conch. xxxii. p. 266, pl. ix. fig. 12. *C. baudii*, Piedmont, *doriae*, Aosta, *ligurica*, Spezzia, and *silensis*, Wood Sila, spp. nn., Pini, Atti Soc. Ital. xxvii. pp. 13-18. *C. sandrii* (Küst.) found only on the shore at Ragusa, lives probably in Montenegro or Albania ; *C. armata* (Kutschig) = *lonzai* (Dkr.), exact locality unknown ; *C. kneri*, new name for *lestnensis* (Kutschig), which lives not at Lesina, but at the Bocche of Cattaro : Brusina, JB. mal. Ges. xi. pp. 113-118. The new name of the third already by the same, in Bull. Soc. mal. Ital. vii. 1881, p. 247. *C. stabilis* (Pfr.), typical form from Banat and Bulgaria, var. n. *hesitans*, Galicia, and var. *aberrans* (West.), Transsylvania ; Westerlund, Nachr. mal. Ges. 1884, pp. 90-92. *C. nomichosi*, *da-corone*, and *theruna*, spp. nn., Letourneux, Bull. Soc. mal. Fr. i. pp. 299-303, Santorin Island. *C. rudis* (Pfr.), Crete, *extensa* (Pfr.) = *vesti* (Böttg.), and *drakakisi*, new name for *extensa* (Böttg., nec Pfr.) ; Maltzan, Nachr. mal. Ges. 1884, pp. 74 & 75. *C. bavayana*, sp. n., Hagenmüller-Rince, Soc. mal. Fr. i. p. 208, near Bona ; and list of the known N. African species : id. t. c. pp. 208-212.

Clausilia (Phadusa) hainanensis, sp. n., Möllendorff, Nachr. mal. Ges. 1884, p. 174, Hainan ; *C. (Phadusa) semprinii* and *pacifica*, spp. nn., Gredler, Arch. f. Nat. l. pp. 273 & 274, pl. xix. figs. 6 & 7, Prov. Hunan, China.

Clausilia (*Garnieria*) *fuchsi*, (*Phædusa*) *paradoxa*, and (*Euphædusa*) *simiola* (all Gredl., 1883), Hunan and Kuangsi, Gredler, JB. mal. Ges. xi. pp. 147–153, the two former figured, pl. iii. figs. 4 & 5: the section *Garnieria* is distinguished by a very narrow neck, broad aperture, and by a dark band below the suture. *C.* (*Phædusa*) *præcelsa*, sp. n., from China, locality not exactly known, *id. t. c.* p. 155, with woodcut. *C. aculus* var. n. *papillacea*, Kuangsi; *id. t. c.* p. 140.

Clausilia pachyodon, *flavescens*, and *frigida*, new names for *pachystoma*, *straminea*, and *septemplicata* (Heude, all pre-occupied); Heude, J. de Conch. xxxii. p. 19. [Already renamed *C. sarcochila*, *missionis*, and *frigida*, by Ancey, 1883; see Zool. Rec. xx. *Moll.* p. 79.—REC.]

Pupa (*Torquilla*) *mortilleti* (Stabile) var. n. *simoni*; Böttger, Nachr. mal. Ges. 1884, p. 47, Mont Cenis.

Gredleriella (Böttger, MS.) subg. n. of *Pupa*, not defined. Type, *P. hunana* (Gredl.). Möllendorff, JB. mal. Ges. xi. pp. 179 & 180.

Pupa pollonerana, sp. n., near *dolium*, Pini, Atti Soc. Ital. xxvii., with woodcut, Italy.

Pupa cupa (Jan.) = *sterri* (Voith), and *P. muscorum* var. *madida* (Gredl.) = *halleriana* (Jeffr. ?, Böttg.); Böttger, Nachr. mal. Ges. 1884, pp. 48 & 49.

Pupa (*Pupilla*) *heudeana*, new name for *cryptodon* (Heude, 1882, *nec cryptodus*, A. Braun, 1842), China; Möllendorff, JB. mal. Ges. xi. p. 176.

Pagodulina, subg. n. of *Pupa*. Type, *P. pagodula* (Desmoul.). Clessin, Deutsche Exc. Moll. Fauna, p. 233. = *Pagodina* (Stabile); *id. t. c.* p. 242.

Edentulina, subg. n. of *Pupa*. Type, *P. edentula* (Drap.). *Id. t. c.* pp. 233 & 253. [Preoccupied in the genus *Ennea*; Clessin's subgenus coincides with *Columella* (Westerlund).]

Pupa (*Leucochilus*) *meridionalis*, sp. n., Möllendorff, Nachr. mal. Ges. 1884, p. 28, and JB. mal. Ges. xi. p. 179, Makao.

Orcula turcica (Bourg.) redescribed by Letourneux, Bull. Soc. mal. Fr. i. p. 298, Santorin.

GONIOGNATHA.

Carthæa, g. n. Goniognath: shell conoidly globose, the whorls slowly increasing, imperforate or narrowly perforate; peristome straight, acute; the columellar margin rather reflexed. *C. kiwi* (Gray, *Helix*) = *irradiata* (Gould), New Zealand. Hutton, Tr. N. Z. Inst. xvi. p. 180. Jaw composed of about fifty overlapping plates, and radula figured; *id. t. c.* p. 170, pls. ix. fig. a, & xi. fig. i.

Phriagnathus celia, sp. n. (= *Hel. fatua* of Hutton, *nec Ph. aphygia*, *ariel*, *titania*, and ? *haastii*, spp. nn., New Zealand, *id. t. c.* pp. 176 & 177. *P. marginatus* (Hutt.) and *regularis* (Pfr., *Helix*): jaw and radula; *id. t. c.* p. 168, pls. ix. fig. s, & xi. fig. d. List of New Zealand species; *id. t. c.* p. 196–198.

Placostylus bovinus (Brug.) from New Zealand; *P. antipodarum* (Gray) is perhaps the young of the same: *id. t. c.* pp. 190 & 191.

Bulimus (Placostylus) ouveanus, monstr. *sinistrorsa* and *scalaris*, Crosse, from the Loyalty Islands; Crosse, J. de Conch. xxxii. pp. 328 & 329, pl. vii. figs. 3 & 4.

[*Bulimulus*] *Bulimus nicholssi* (Brown, MS.), sp. n., Angas, P. Z. S. 1883, iv. [1884], p. 596, Dominica, West Indies, with woodcut, p. 595.

Cylindrella assimilis, *contentiosa*, *lajoncherei*, *thomsoni*, and *infortunata*, spp. nn., Arango, P. Ac. Philad. 1884, ii. pp. 211 & 212, woodcuts, Cuba.

Amphibulina patula (Fer.). Woodcut of the living animal from Dominica; Angas, P. Z. S. 1883, p. 595.

ELASMOGNATHA.

Janella bitentaculata (Quoy) and *marmorea* (Hutt.). Jaw and radula; Hutton, Tr. N. Z. Inst. xvi. pp. 173 & 206, pls. x. figs. *m* & *n*, & xi. fig. *x*.

Athoracophorus virgatus, sp. n., E. A. Smith, P. Z. S. 1884, p. 263, pl. ii. fig. 1, Admiralty Islands.

Triboniophorus. Critical remarks; *id. t. c.* p. 273.

Succinea putris varr. nn. *angusta* and *minuscule*, and var. *vitrea* (Moq.); Baudon, J. de Conch. xxxii. pp. 214-216, pl. ix. figs. 1-3, Dep. Oise. *S. pfeifferii*, new variety; Salvana, R. Ac. sci. nat. Barcelona, 1883, p. 399, Bodellara, Prov. Barcelona. *S. hygrophila*, new name for *rubella* (Heude, preoccupied); Heude, J. de Conch. xxxii. p. 19 [already renamed *S. erythrophana* by Ancey, 1884]. *S. falklandica*, sp. n., E. A. Smith, P. Z. S. 1884, p. 280, pl. xxiii. fig. 20, Falkland Islands.

VAGINULIDÆ.

Veronicella bocourti, sp. n., Rochebrune, Bull. Soc. Philom. (7) vi. 1882, p. 117, Bankok.

ONCHIDIIDÆ.

J. BROCK gives an abstract of Joyeux-Laffaie's observations [Zool. Rec. xix. *Moll.* p. 89], and comes to the result that *Onchidium* is a Nudibranch, perhaps aberrant in some points, and in process of becoming an air-breather. R. BERGH, on the contrary, recapitulating also the chief points of our knowledge concerning the anatomy of this genus, and relying on his very extensive knowledge of the *Nudibranchiata*, states that *Onchidium* is widely separated from them, but agrees with the *Pulmonata* in the structure of the nervous system, in the existence of a lung, &c.; the *Onchidia* "are *Pulmonata* which have adapted themselves to an amphibious or marine mode of life." Ann. N. H. (5) xiv. pp. 259-266.

R. BERGH treats of the genus *Onchidium* in an appendix to his paper on the *Nudibranchiata* of the 'Challenger,' but he declares formally that they have really nothing to do with the *Nudibranchiata*, and are connected by a number of intermediate links with the *Pulmonata*; he describes *O. melanopneumon*, sp. n., Viti Islands, and comparatively *tonganum* (Q. G.) and *verruculatum* (Cuv.), both from the Nicobars, anatomically: Zool. Challenger. x. pp. 126-151, pls. iv. figs. 25-27, v. fig. 1-27, vi. figs. 5-21,

vii. figs. 1-12, & viii. fig. 14. Abstract, with critical remarks, the nervous system of *O. melanopneumon*, as described by Bergh, much differing from that observed in *O. celticum*, by J. Joyeux-Laffaie, Arch. Z. expér. (2) iii. 1885, pp. ix.-xi.

AURICULIDÆ.

Abstract of Crosse & Fischer's observations concerning the absorption of the inner whorls, in J. R. Micr. Soc. (2) iv. pp. 730 & 731.

Pythia apiensis, sp. n., E. A. Smith, P. Z. S. 1884, p. 268, pl. xxii. fig. 10, New Hebrides. And notes on other species of *Pythia*; *id. t. c.* pp. 261-268.

Alexia myosotis (Dr.). On its occurrence in Malta; Becher, J. of Conch. iv. p. 237.

Ophicardelus costellaris (Ad.). Radula; Hutton, Tr. N. Z. Inst. xvi. p. 212, pl. xi. fig. 1.

Leuconopsis, g. n. Distinct from *Leuconia* by having only one plait on the inner lip. *L. obsoleta* (Hutt., *Leuconia*): radula described; *id. t. c.* p. 213.

LIMNÆIDÆ.

Limnæa. Figures and observations concerning the species found at Dordrecht, amongst which are some abnormalities, by J. B. Rosendael, in a separate pamphlet [title, *vide supra*].

Limnæa stagnalis varr., *livonica*, sp. n., Gulf of Riga, intermediate between the groups of *stagnalis* and *auricularia*, *L. auricularia* var. *confinis* (Mouss.), Armenia, *burnetti* (Alder), Loch Skene, probably a lacustrine variety of *ovata*, *korpinskii* (Siemaschko?), Southern Russia, *ovata* var. *janoviensis* (Krol), Breslau, var. *fluminea* (Clessin), River Danube at Regensburg, and *palustris* var. *taurica* (Clessin), Krym; Kobelt, Iconogr. Land u. Süssw. Moll. (2) i. pp. 57-62, pl. xxi.-xxiv. figs. 168-207. *L. palustris* var. n. *obesa*; Taylor, J. of Conch. iv. p. 134, Faversham. *L. palustris* [?] var. *elata* and var. n. *vuillefroyi*; Baudon, J. de Conch. xxxii. pp. 279 & 280, pl. ix. figs. 14 & 15, Dep. Aube. *L. turricula* var. n. *transsylvanica*; Kimakowicz, Verh. siebonb. Ver. xxxiv, Transsylvania. *L. livonica*, sp. n., Kobelt, Nachr. mal. Ges. 1884, p. 26, Bay of Riga. *Limnæa* spp. nn., Hutton, N. Z. J. Sci. ii. p. 175.

Limnæa, subg. *Gulnaria*. J. Hazay gives some general and historical notes on *L. auricularia*, *ovata*, and *peregra*. The two former are, according to him, quite distinct from one another, the liver being reddish-grey in the first, yellowish-brown in the second, the uterus representing a bag bent on itself, of nearly white colour in *auricularia*, globular, plaited, and twisted, bluish grey in *ovata*, the cœcula of the hermaphrodite gland being finger-shaped in *auricularia*, grape-like in *ovata*; the lateral teeth near the median one in the radula being as broad as high in *auricularia*, higher than broad in *ovata*, &c. *L. peregra*, on the contrary, is regarded by the author only as a biological variety of *L. ovata*, living in "hard," running water, which contains more carbonic

acid; the author mentions some cases, in which eggs of *L. ovata* were transferred into springs or rivulets, and the animals hatched from them did become *L. peregra*, and also *vice versâ*. Mal. Bl. (2) vii. pp. 18-48.

Limnophysa palustris var. n. *admontensis*, sp. n., Tschapeck, Nachr. mal. Ges. 1884, p. 19, Styria.

Physa melitensis (Mamo) is a variety of *acuta* (Drap.); Becher, J. of Conch. iv. p. 230.

Microphysa? pumila (Hutt.). *Radula*; Hutton, Tr. N. Z. Inst. xvi. p. 166, pl. ix. fig. q.

Ancylus flaviatilis and *lacustris* (Müll.): anatomy; B. Sharp [title, *vide supra*]. *A. assimilis*, sp. n., Petterd, J. of Conch. iv. p. 159, Richmond River, New South Wales.

Gundlachia in Tasmania; *id. t. c.* p. 150.

Planorbis. S. CLESSIN continues his monograph in Küster's Conch. Cab. pts. 328 & 331, pp. 111-182, pls. xxiii.-xxxvi. The following species are new or not before figured:—*P. barbadensis* (Dkr., MS.), Barbadoes, p. 118, *dunkerianus*, sp. n., Cuba, p. 122, pl. xvii. fig. 14, *janeirensis*, sp. n., Rio Janeiro, p. 123, pl. xviii. fig. 3, *barrakporensis*, sp. n., Barrakpore, p. 125, pl. xviii. fig. 7, *surinamensis* (Dkr., MS.), sp. n., Surinam and Jamaica, p. 126, pl. xvii. fig. 11, *pulchellus* (Phil., MS.), sp. n., Bolivia, p. 137, pl. xvi. figs. 12-14, *huttoni* (Bens.), between Calcutta and Benares, p. 139, pl. xviii. fig. 4, *himalayanus* (Hutton, MS.), sp. n., Himalaya, p. 141, pl. xx. fig. 8, *crystallinus* (Pfr., MS.), sp. n., East Indies, p. 141, pl. xviii. fig. 3, *declivis* (Gould, MS.), Cuba, p. 142, pl. xvii. fig. 18, *aracacensis* (Gundl.) = *isabel* (Sow.), Cuba, p. 143, pl. xv. fig. 7, *gundlachi* (Dkr., MS.), sp. n., Trinidad, p. 146, pl. xvii. fig. 8, *macnabianus* (Ad.), Cuba, p. 146, pl. xi. fig. 3, *titicacensis*, sp. n., Lake Titicaca, p. 147, pl. xiii. figs. 23-25, *gruneri* (Dkr., MS.), sp. n., Singapore, p. 148, pl. xxi. fig. 9, *singularis* (Mouss.), Viti Islands, p. 149, pl. xxi. fig. 6, *crassilabrum* (Morelet), Anjoana and Nossi Bé, p. 150, pl. xxii. fig. 6, *fieldi* (Mouss., MS.), Samoa Islands, p. 154, pl. xxii. fig. 10, *aberrans* (Martens), Shanghai, p. 155, pl. xxiii. fig. 6, *purus* (Martens), Southern Brazil, p. 156, pl. xxiii. fig. 8, *infralineatus* (Martens), Java, p. 157, pl. xxiii. fig. 4, *bavayi* (Crosse, MS.), Guadeloupe, p. 161, pl. xxii. fig. 9, *moreletianus*, sp. n., La Guayra, p. 162, pl. xxiv. fig. 1, *auriculatus*, sp. n., Jamaica, p. 163, pl. xxiv. fig. 10, *planulatus*, sp. n., St. Thomas, p. 163, pl. xxiv. fig. 8, *hondurasensis*, sp. n., Honduras, p. 164, pl. xxiv. fig. 2, *planissimus* (Mouss.), Cape York, p. 165, pl. xxiv. fig. 7, *brazieri*, new name for *fragilis* (Brazier, preoccupied), Tasmania and Queensland, p. 166, pl. xxiv. fig. 6, *waterhousei*, sp. n., Clarence River, Australia, p. 188, pl. xxviii. fig. 2, *duemeli*, sp. n., Cape York, p. 189, pl. xxviii. fig. 3, *sivalensis* (Hutton, MS.), East Indies, p. 194, pl. xxviii. fig. 9, *neglectus* (Hasselt), Eastern Asia, p. 194, pl. xxix. fig. 5, *tamsianus* (Dkr.), Africa, p. 195, pl. xxix. fig. 9, *trivialis* (Morel.), Mayotte, p. 196, pl. xxix. fig. 7, *intermedius* (Phil.), Mexico, p. 196, pl. xvi. figs. 18 & 19, *socius*, *concinus*, and *stroemi* (Westerl.), Sweden and Norway, pp. 199 & 200, pls. xxx. fig. 6, & xxxi. figs. 1 & 6, *ehrenbergi* (Beck), Alexandria, p. 201, pls. xxxi. fig. 3, *infraliratus* (Westerl.), Siberia, p. 202, pl. xxxi. fig. 7, *kabilianus*

(Letourneux), Algiers, p. 203, pl. xxx. fig. 2, *tetragyryus* (Westerl.), Dalmatia, p. 203, pl. xxx. fig. 4, *strauchianus*, sp. n., Russia, p. 204, pl. xxxi. fig. 5, *hohenackeri*, sp. n., Himalaya, p. 203, pl. xxxi. fig. 7, *poeyanus*, sp. n., Domingo and Cuba, p. 205, pl. xxxi. fig. 2, *ingenuus* (Morelet), New Caledonia, p. 206, pl. xxxi. fig. 4, *petenensis* and *nicaraguanus* (Morelet), Central America, pp. 206 & 207, pl. xxxi. figs. 9 & 10, *salvini* (Tristram), Guatemala, p. 207, pl. xxxi. fig. 8, *maya* (Morel.), Antigua, p. 208, pl. xxxii. fig. 2, *colon* (Morel.), locality unknown, p. 209, pl. xxxii. fig. 3, *guatemalensis*, sp. n., Guatemala, p. 209, pl. xxxii. fig. 7, *decipiens* (Ad.), St. Thomas and Jamaica, p. 210, pl. xxxii. fig. 5, *schmackeri*, sp. n., Canton, p. 211, pl. xxxii. fig. 4, *moellendorfi*, sp. n., Canton, p. 212, pl. xxxii. fig. 1, *heudei*, sp. n., Hong Kong, p. 213, pl. xxxii. fig. 9, *schweinfurthi*, sp. n., Oasis Charge, p. 213, pl. xxxii. fig. 8, and *subcarinatus* (Nevill, MS.), sp. n., p. 214, pl. xxxii. fig. 10.

Gyraulus crista var. n. *bielzi*; Kimakowicz, Verh. siebenb. Ver. xxxiv., Transsylvania.

Planorbis (Hippeutis) syracusanus, sp. n., Cafici, Nat. Sicil. iii. p. 215, Syracuse.

Planorbis niloticus, *arctespira*, *charopus*, *laurenti*, *savignyanus*, *eremiophilus*, *prochylostoma*, *cyclomphalus*, *innesi*, *eximius*, *letourneuxi*, *tachyggyrus* (all Bourguignat, MS.), *cosmius* and *mareoticus* (Letourneux MS.), *subsalinarum*, *schweinfurthi*, *tanquerelianus*, and *pulchellus*, spp. nn., all from Egypt, and list of other described species from that country; Innes, Bull. Soc. mal. Fr. i. pp. 329-345. *P. membranaceus*, sp. n., near *stelzneri* (Dohrn), China, Prov. Hunan; Gredler, JB. mal. Ges. xi. p. 153.

Planorbis (Segmentina) succineus, sp. n., Gredler, Arch. f. Nat. l. p. 275, Prov. Hunan, China.

Planorbis dorrianus, sp. n., near *nitidus*, Wattebled, J. de Conch. xxxii. p. 126, pl. vi. fig. 2, Cochin China.

PULMONATA OPERCULATA.

CYCLOPHORIDÆ.

Cyclotus auriculatus, *caroli*, and *latecostatus*, spp. nn., Kobelt, Nachr. mal. Ges. 1884, pp. 49 & 50, Philippines. *C. charmian*, sp. n., New Zealand, Hutton, Tr. N. Z. Inst. xvi. p. 183.

Cyclostoma [*Cyclotus*] *infans*, sp. n., E. A. Smith, P. Z. S. 1884, p. 266, Admiralty Islands.

Pterocyclos fischerianus, sp. n., Morlet, J. de Conch. xxxii. p. 393, pl. xii. fig. 2, Pnom, Cambodia.

Cyclophorus cousini, sp. n., Jousseume, Bull. Soc. Z. Fr. ix. Nos. 3 & 4, p. 173, Ecuador. *C. cambodgensis*, *paviei*, *klobukowskii*, and *landesi*, spp. nn., Morlet, J. de Conch. xxxii. pp. 388-392, pls. xi. figs. 3-5, & xii. fig. 1, Cambodia. *C. semperi* and *trochiformis*, spp. nn., Kobelt, Nachr. mal. Ges. 1884, p. 51, Philippines.

Cyclophorus (Scabrina) hirsutus, sp. n., Möllendorff, Nachr. mal. Ges. 1884, p. 169, Hainan.

Lagecheilus pilosus and *longipilus*, spp. nn., *id. t. c.* p. 170, Hainan.

Leptopoma melanostoma (Petit) : white- and black-lipped varieties from Amboina ; E. A. Smith, P. Z. S. 1884, p. 261. *L. pannosa* and *calva* (Hutt.) : radula ; Hutton, Tr. N. Z. Inst. xvi. pp. 173 & 174, pl. x. fig. v. *L. ? pallida*, sp. n., New Zealand, *id. t. c.* p. 184.

Alycaeus nipponensis (Reinh.) and *latecostatus* (Mölland.) : critical note ; Gredler, Arch. f. Nat. l. p. 259, footnote. 8 species of *Alycaeus* from India figured by Godwin-Austen, Land and Freshw. Moll. India, pt. 5, pls. xlv. & xlviii.

PUPINIDÆ.

Pupina ephippium (Gredl.) : radula ; Gredler, Nachr. mal. Ges. xi. p. 157, pl. iii. fig. 6. *P. flava*, sp. n., Möllendorff, *t. c.* p. 171, Hainan.

Raphaulus. 4 species figured by Godwin-Austen, *t. c.* pl. xlvii.

DIPLOMMATINIDÆ.

Diplommatina. Godwin-Austen figures the living animal, and the radula of some and the shells of 28 species from India ; *t. c.* pls. xlv., xlvii., xlix., & l.

CYCLOSTOMIDÆ.

Georgia and *Rochebrunia* (Bourg.) not distinct from *Otopoma*, the umbilicus being partly or completely covered even in different specimens of the same species, and the projection of the pillar lip diminishing gradually ; Crosse, J. de Conch. xxxii. pp. 361 & 364.

Guillainia, g. n. Testa turbinato-turriculata ; apertura parva, valde obliqua ; peristoma simplex, tenue, margine externo subacuto ; umbilicus carina circumscriptus. Operculum unknown. Type, *Cyclostoma gratum* (Petit) = *tricolor* (Pfr.), from the Island Abd-el-Goury. Crosse, J. de Conch. xxxii. p. 370.

Cyclostoma elegans : operculum ; Houssay, Arch. Z. expér. (2) ii. pp. 193-196, pl. viii. figs. 1, 2, 8, & 13.

Choanopoma uncinatum, sp. n., Arango, P. Ac. Philad. 1884, ii. p. 211, woodcut, Cuba.

Realia turriculata and *hochstetteri* (Pfr.) : radula and operculum ; Hutton, Tr. N. Z. Inst. xvi. p. 174, pl. xi. fig. h.

Pomatias subalpinus, sp. n., Alpes Maritimes, *striolatus* var. n. *de-filippii*, Nervi, *valdebinus*, sp. n., Valsabina, *stabilei*, sp. n., Valsassina ; Pini, Atti Soc. Ital. xxvii. pp. 3-9. *P. boettgeri* (Westerlund) ; Cascio, Nat. Sicil. iii. p. 215, Palermo.

TRUNCATELLIDÆ.

Acme microspira, sp. n., Pini, Atti Soc. Ital. xxvii. p. 10, Val Brembana. *A. stussineri*, sp. n., Böttger, Nachr. mal. Ges. 1884, p. 185, Upper Carniola, only 1½ mm. long.

Truncatella semperi, sp. n., Kobelt, Nachr. mal. Ges. 1884, p. 52, Philippines.

Albertisia punica (Issel, 1880) seems to be a variety of *Truncatella truncatula* (Dr.); Monterosato, Nat. Sicil. iv. p. 21. [Cf. Zool. Rec. xvii. Moll. p. 96.]

HELICINIDÆ.

Helicina mouhoti (Pfr., as *Trochatella*) var. n. *martensi*, Kuangsi, China; Gredler, JB. mal. Ges. xi. p. 141. *H. ponsonbyi*, sp. n., E. A. Smith, P. Z. S. 1884, p. 266, Admiralty Islands.

SOLENOCONCHÆ.

Cadulus pandionis (Verr.) = *olivi* (Scacchi); Jeffreys, Rep. Brit. Ass. 1884, p. 553.

BIVALVIA.

P. FISCHER recapitulates and criticizes the new classification of the Bivalves proposed by NEUMAYR [see Zool. Rec. xx. Moll. p. 86]. He thinks that the characters of the hinge are not of so high a value for classification, compared with those of the soft parts, appealing to the undeniable natural affinity of *Unio* with *Pleiodon* and *Anodonta*, and on that of *Tellina* with *Scrobicularia*, and *Donax* with *Mesodesma*; further, he doubts whether the *Palæoconchæ* are really the oldest forms of Bivalves, as the shells from the Cambrian beds in South Wales described by Hicks belong to Neumayr's *Taxodonta* and *Heterodonta*. Concerning the *Taxodonta*, he states that Latreille's group of *Plagimyones*, 1825, and Blainville's *Polydontes*, 1824, are exactly the same, and can claim the priority of name. J. de Conch. xxxii. pp. 113-122.

MONOMYARIA.

OSTREIDÆ.

Ostrea edulis. An oyster of $2\frac{1}{2}$ in. in length, fixed on a crab, *Cancer irroratus* (Say), of 2 in. across and $1\frac{3}{4}$ in. in length; Lockwood, Am. Nat. xviii. p. 200. G. BOUCHON-BRANDELY treats the artificial fecundation of the oysters in a separate pamphlet [title, vide *suprà*]. P. HOEK compares cultivated specimens of oysters with others grown up in freedom; Tijdschr. Nederl. Dierk. Ver. Suppl. D1, pp. 481-495. A. HUBRECHT treats on the oyster breeding in confinement, *t. c.* pp. 319-367; and, further, on the physical conditions which the Ooster-Schelde offers with regard to oyster culture, *t. c.* pp. 369-479. C. RUMPFER urges the importance of the oyster as a popular article of food in N. America, in Circ. deutsch. Fisch. Ver. 1884, pp. 60-62 (transl. in Bull. U. S. Fish. Comm. iv. pp. 356-358). G. BROWN GOODE gives dates concerning the oysters produced in different parts of Europe and in N. America; *t. c.* p. 468, also Circ. deutsch. Fisch. Ver. 1884, p. 242. K. MÖBIUS reports on the transport of living oysters

from Canada to Aarøe Island, in the western part of the Baltic; Circ. deutsch. Fisch. Ver. 1884, pp. 127 & 239-240; most of them survived, after having been packed for 20 days. F. WINSLOW publishes a short memorandum on the present condition and future needs of the oyster industry, in Bull. U. S. Fish. Comm. iv. pp. 233 & 234; and J. A. Ryder a report respecting the present condition and future prospects at St. Jerome Creek for the work of oyster culture, *t. c.* pp. 235-237. J. A. RYDER describes a new form of filter or diaphragm to be used in the culture of oysters in ponds, *t. c.* pp. 17-31; and floats for the so-called fattening of oysters, *t. c.* pp. 302-304; an apparatus for collecting oyster spat, *t. c.* pp. 373-375. The same publishes the journal of operations on the grounds of the Eastern Shore Oyster Company, on Chincoteague Bay, Maryland, during the summer of 1883; *t. c.* pp. 43-47. P. BROCCHI's report on the condition of oyster culture in France in 1881 [Zool. Rec. xviii. *Moll.* p. 93] translated in Bull. U. S. Fish. Comm. iv. pp. 97-111. Anonymous note on the abundance of star-fish on oyster beds near New Haven; Bull. U. S. Fish. Comm. iv. p. 138. An apparatus for gathering oyster spat, exhibited by Wemeling's Company in the International Fishery Exhibition at London, 1883, figured and described in Circ. deutsch. Fisch. Ver. 1884, p. 221.

A. de Gregorio distinguishes and characterizes the following species and varieties of *Ostrea* living in the Mediterranean: *lamellosa* (Brocchi) var. n. *barrensis*; *O. mitulamellosa*, sp. n., *edulis* varr. nn. *peduncrassa*, *cimbina*, *navicella*, *prostrema*, *cumpa*, and *alicuricola*, *cochlear* (Poli) varr. nn. *monterosati* and *lineocostata*; and adds several others from the Upper Tertiary beds: Bull. Soc. mal. Ital. x. pp. 37-48 [some of these names are rather strange—REC.]. *O. edulis* var. *adriatica* (Lam.) = *venetiana* (Issel); *id. t. c.* p. 198.

Ostrea cochlear (Poli): two varieties; Foresti, Ann. Soc. mal. Belg. xvii. p. 27.

Placuna lobata (Sow.) = *planicostata* (Dkr.), var. of colour; E. A. Smith, Zool. Coll. Alert, p. 117.

PECTINIDÆ.

Spondylus victorie (Sow.), from N.E. Australia: critical note; E. A. Smith, *t. c.* p. 114.

Pecten leopardus (Rv.), with varieties *kuhnoltzi* (Bern.) and *solaris* (Sow.; Rv., nec Born), Arafura Sea and Queensland; *id. t. c.* p. 112. *P. hyalinus* (Poli) var. n. *niveoradiata*, *flexuosus* (Poli) varr. nn. *alterninus* and *gabus*; *P. golus*, sp. n., near *sulcatus*, from a sponge; *pes-lutra* (L.) varr. nn. *siculus* and *simplexariosus*; *pes-felis* (L.) varr. nn. *bimus* = Reeve, fig. 66b, *capensis*, *detrus* = Reeve, fig. 66a, and *alipus varius* (L.); varr. nn. *arzellus* and *gaperas*; all from the Mediterranean; Gregorio, Bull. Soc. mal. Ital. x. pp. 183-190.

Pecten (*Amusium*) *milne-edwardsi*, sp. n., New Caledonia, *P. oweni*, new name for *pictus* (Sow.), and *jeffreysi*, new name for *corneus* (G. B. Sow.), from Magellan Strait, both being preoccupied in fossil species; A. de Gregorio, Nat. Sicil. iii. p. 133.

HETEROMYARIA.

AVICULIDÆ.

Vulsella. A. de Gregorio distinguishes two subgenera:—(1) *Abisa*, subg. n. Shell thick, inner layer not or scarcely nacreous; cardinal plate rather large. *V. navicula*, *claripta*, *valida*, *tigrina*, *pulchella*, *ringella*, *scrobula*, *umbotropa*, and *cochlearina*, spp. nn., found in sponges, chiefly from Tunis [?]. (2) *Madrela*, subg. n. Shell thin, subtransparent, internally nacreous; cardinal plate rather small. *V. spongiarum* (Lam.) and *virginis*, *cilestrina*, *mirula*, *umboversa*, *mitis*, *blanda*, and *peregrina*, from Tunis [?]. *V. vulsella* (L.), *indipa*, sp. n., *rugosa* (Leach), *ililima* and *vuma*, spp. nn., *hians* (Lam.), *mytilina* (Lam.), from the Red Sea. Bull. Soc. mal. Ital. x. pp. 49–72, pls. i.–v. [The distinction of so many species in a genus, in which the individual variation of shape is so very great on account of its sedentary life, is somewhat precarious.—REC.]

Fundella, g. n. Hinge as in *Malleus*; structure of the shell and inequality of the valves as in *Ostrea*; cardinal line straight, and a wing, as in *Avicula*; shell gaping on one side; external aspect of the summits as in *Anomia*, internal as in *Ostrea* [!]. *F. lioyi*, sp. n., 25 mm., in a sponge from Tunis; Gregorio, Bull. Soc. mal. Ital. x. pp. 72 & 73, pl. i. fig. 6. [Photograph, not very clear figure; much resembles the young state of *Malleus regula* (Forsk.), from the Red Sea.—REC.]

Pinna pectinata (L., Weinkauff) var. n. *fundazzensis*, and *rudis* (L., Hanl.) var. *pernula* (Chemn., Weinkauff), from the Mediterranean, *tetragona* (Brocchi) var. n. *posttetragona*, in Post-pliocene beds of Monte Pellegrino; Gregorio, Bull. Soc. mal. Ital. x. pp. 77–80. *P. nobilis* (L.) varr. nn. *latella*, *magu*, *pisciformis*, *intermillia*, *gangina*, and *nigella*, all from Palermo; *id. t. c.* pp. 199–201.

On the pearl oyster [vide *suprà*, p. 35].

MYTILIDÆ.

Limnoperna, g. n. Testa exilis, æquivalvis, inæquilateralis, postice carinata, subtorta, umbonibus anticis obtusiusculis, fere absconditis; cardo linearis, ligamento marginali subexterno; impressio pallialis lata conica, sinu brevi, obtuso. Living in fresh-water. *L. lemeslei*, sp. n., Lake Rham-penk, Cambodia. To this genus belong also *Modiola siamensis* (Morelet) and *lacustris* (Martens). Rochebrune, Bull. Soc. Philom. (7) vi. pp. 102–105.

Modiolaria mirunda, Arafura Sea, and *varicosa*, Port Jackson, spp. n. E. A. Smith, Zool. Coll. Alert, pp. 108 & 109, pl. vii. figs. m & n.

DREISSENIIDÆ.

Dreissenia crosseana, sp. n., Morlet, J. de Conch. xxxii. p. 402, pl. xiii. fig. 3, Cambodia.

TRIDACNIVTA.

Tridacna and *Hippopus*. 8 species;
 ... ARCIDÆ.

Arca navicularis (Brug.) varr., *lima* (Rv.), *tenebrica* (Rv.), and *symmetrica* (Rv.): emendations of descriptions; E. A. Smith, *t. c.* pp. 109-111. *A. latecostata* (Nyst, Coq. foss. Belg., 1843) = *antiquata* (Poli, Philippi) = *polii* (Mayer, 1868), living in the Mediterranean and Post-pliocene in Sicily; Gregorio, Bull. Soc. mal. Ital. x. pp. 84 & 85.

NACULIDÆ.

Leda darwini, sp. n., E. A. Smith, *t. c.* p. 111, pl. vii. fig. i, Port Darwin.

HETERODONTA.

TRIGONIDÆ.

Trigonia. 5 species; Sowerby, Thesaur. Conch. pts. 41 & 42, pp. 187 & 188, pl. cccccxii.

UNIONIDÆ.

Unio. H. Jordan distinguishes in the common European species, as *U. pictorum* (L.), *tumidus* (Retz.), &c., forms adapted to running water, which have not only a thicker shell generally, but are also much more convex in the fore-half, which is opposed to the current, and more compressed behind, and the forms of stagnant water, in which this difference is less marked; specimens of two different species found in the same river or lake have, therefore, sometimes a remarkable resemblance one to the other: Nova Acta Ac. L.-C. Nat. cur. xlv. No. 4, pp. 242-251, pls. vi.-xiii.

Unio brachyrhynchus (Drouet), Lake of Garda, *rothi* var. *komarowi* (Böttg.), Kars, *requienii* (Mich.) several varieties from Lombardy, Tuscany, and Rome, *ravoissieri* (Desh.) var. *n. isserica*, *U. tafnanus* (Debeaux, MS.), sp. n., both from Oran, *tetuanensis*, sp. n., Tetuan, *crassus* var. *maximus* (Kobelt), Slesvic, and *savensis* (Drouet), Belgrade; Kobelt, Iconaco, Land u. Süssw. Moll. (2) i. pp. 63-69, pls. xxvi.-xxx. figs. 211-222. *U. fiddensis*, Lago di Garlate, and *cusianus*, Lago di Cusio, spp. nn., Pini,

Gastra Ital. xxvii., woodcut. *U. dokici*, *serbicus*, *truncatulus*, and p. 125, Me. nn., Servia, and the other species known from that country, *Psammobi*. Drouet, Suppl. aux Unionidæ de la Serbie (Paris: 1884, 16 pp.). *U. savensis*, *pancei*, and *striolatus* from Servia, and *steviani* from Crimea, figured, pls. i. & ii. *U. micelii* and *medjerda*, spp. nn., Kobelt, Nachr. mal. Ges. 1884, pp. 182 & 183, Tunis. *U. omiensis*, sp. n., Heimbürg, Nachr. mal. Ges. 1884, p. 93, Japan, Prov. Omi. *U. monticola* and *simpularius*, new names for *montanus* and *modestus* (Heude, pre-occupied); Heude, J. de Conch. xxxii. pp. 19 & 20. *U. decampsianus*, sp. n., Wattlebled, J. de Conch. xxxii. p. 152, pl. vii. fig. 1, Niger River at

Bomakon. *U. depauperatus* and
Tr. N. Z. Inst. xvi. p. 216.

OMYARIA.

Margaritana margaritifera (L.) of the
province of Hanover, described and figured, bibliography, and
abstract from J. Taube's Treatise of 1766, by F. Borcharding, Abh.
Ver. Brem. ix. 2, pp. 147-166, pl. iii. *M. bonellii* (Fer.), Carniola, and
crassula (Dronet), Castelgoffredo, near Mantua; Kobelt, Iconogr. Land
u. Süßw. Moll. pp. 62 & 63, pls. xxv. figs. 208 & 209, & xxvi. fig. 210.

Pseudodon thomsoni, sp. n., Morlet, J. de Conch. xxxii. p. 401, pl. xiii.
fig. 2, Cambodia.

Anodonta reneana, *philydra*, *elodæa*, and *camurina*, spp. nn., Pechaud,
Bull. Soc. mal. Fr. i. pp. 189-196, Dep. Nièvre, France. *A. del-pretei* and
raimondei, spp. nn., Bourguignat, Nat. Sicil. ii. pp. 21 & 23, Viareggio,
Italy, with list of other species from Italy. *A. brevirostris*, Lago di
Garlate, and *palustris*, marshes on the banks of the Po and Ticino,
spp. nn., Pini, Atti Soc. Ital. xxvii., woodcuts; the last renamed *paludosa*,
the name *palustris* being preoccupied, *id. t. c.* *A. retusa*, new name
for *obtusata* (Heude, preoccupied); Heude, J. de Conch. xxxii. p. 20. *A.*
grijalvae and *tabascensis*, sp. n., Morelet, J. de Conch. xxxii. pp. 122-125,
Tabasco.

ASTARTIDÆ.

Crassatella pulchra, *castanea*, *erronea*, *decipiens* (Reeve), *cumingii* (A.
Ad.), and *donacina* (Lam.), all probably varieties of *kingicola* (Lam.);
E. A. Smith, Zool. Coll. Alert, p. 108.

LUCINIDÆ.

Anatomical description of the foot in this family, by T. Barrois [title,
vide *suprà*].

Lucina virgo (Reeve), from the Cape Verde Islands; Tausch, JB. mal.
Ges. xi. p. 188, woodcut.

Lucina (*Divaricella*) *ornata* (Reeve). Synonymy and difference from
dentata (Wood); E. A. Smith, Zool. Coll. Alert, p. 103.

Diplodonta subcrassa and *sublateralis*, spp. nn., *id. t. c.* p. 104, pl. vii.
figs. i and k, Torres Straits.

Cryptodon obesus (Verr.) = *Axinus flexuosus* (Mont.) var. *polygona*;
Jeffreys, Rep. Brit. Ass. 1884, p. 553.

KELLIIDÆ.

Kellia jacksoniana, sp. n., E. A. Smith, *t. c.* p. 105, pl. vi. *eslei*,
Jackson; *K. citrina* and *sanguinea*, sp. n., Hutton, Tr. N. Z. Soc. Phil.
p. 215, New Zealand. *Iodiola s.*

GALEOMMATIDÆ.

Scintilla cuvieri (Desh.), Queensland, *aurantiaca* (Desh.), North Aus-
tralia and Queensland, and *alberti*, sp. n., Torres Straits, E. A. Smith,
Zool. Coll. Alert, pp. 105-107, the two latter, pl. vii. figs. g & h.

TRIDACNIDÆ.

Tridacna and *Hippopus*. 8 species; Sowerby, Thesaur. Conch. pts. 41 & 42, pp. 179-182, pls. cccclxxxv.-ccccxxxix.A. *T. gigas* of Reeve is = *mutica* (Lam.), *compressa* (Reeve) = *elongata* (Lam.), *ferruginea* (Reeve) a variety of *crocea* (Lam.), a true *gigas* (L.) 3 feet long, fig. 11.

CHAMIDÆ.

Chama gryphoides (L.) varr. nn. *ridella* and *merga*, Palermo, *spongilla*, Smyrna, and *gryphina* (Brocchi), sinistral, var. n. *mediterranea*, and their fossil allies; Gregorio, Bull. Soc. mal. Ital. x. pp. 202-212.

CARDIIDÆ.

Cardium maculosum (Wood). Variability and synonymy; E. A. Smith, t. c. p. 102.

CYRENIDÆ.

Sphærium costaricense, sp. n., Prime, P. U. S. Nat. Mus. vii. p. 102, Yuriria Lake, Costa Rica.

VENERIDÆ.

Cytherea (*Caryatis*) *cozeni*, sp. n., E. A. Smith, Zool. Coll. Alert, p. 95, pl. vii. fig. a, Queensland.

Dosinia histrio (Gm.) var. n. *alba*, id. t. c. p. 96, N.E. Australia.

Clementia tasmanica, sp. n., Petterd, J. of Conch. iv. p. 145, Tasmania.

Venus simulans (Sow.) recent at the Cape Verde Islands; Tausch, JB. mal. Ges. xi. p. 187, with woodcut. *V. torresiana*, sp. n., E. A. Smith, t. c. p. 94, pl. vi. fig. m, Torres Straits. *V. lamellaris* (Schumacher) = *subrostrata* (Gray) = *lamarckii* (Gray), E. coast of Australia; Brazier, P. Linn. Soc. N. S. W. ix. pp. 799 & 800.

Petricola lapicida (Chemn.): variability; E. A. Smith, t. c. p. 98. *P. mirula*, sp. n., Gregorio, Bull. Soc. mal. Ital. x. p. 127, African part of the Mediterranean, in sponges.

TELLINIDÆ.

Tellina semilævis (Martens) = *tenuilirata* (Sow., fig. 253); E. A. Smith, Zool. Coll. Alert, p. 507. *T. semen* (Hanl.): critical note; id. t. c. p. 99.

Macoma edentula (Brod.) var. ? *middendorffi*, new name for *edentula* (Middendorff), Behring Island; Dall, P. U. S. Nat. Mus. vii. p. 347.

Gastrana fragilis (L.) var. n. *nigella*, Gregorio, Bull. Soc. mal. Ital. x. p. 125, Mediterranean.

Psammodia gracilentia, sp. n., E. A. Smith, t. c. p. 98, pl. vii. fig. b, Torres Straits.

DESMODONTA.

PAPHIIDÆ.

Syndosmya elliptica (Sow., as *Tellina*), Port Jackson; E. A. Smith, t. c. p. 89, pl. vii. fig. c.

MACTRIDÆ.

Maetra. Monograph continued and finished by H. C. Weinkauff, in Kuster's Conch. Cab. pt. 329, pp. 93-124, pls. xxxi.-xxxvi.; *M. bistrigata* (Mörch), Panama, p. 102, pl. xxxiv. figs. 5-7, and *planulata* (Conrad), California, p. 103, pl. xxxv. figs. 1 & 2, not before figured. *M. producta* (Aug.) var. from Port Jackson, and *M. (Oxyperas) coppingeri*, sp. n., Torres Straits, E. A. Smith, *t. c.* p. 100, the latter, pl. vii. fig. d.

SAXICAVIDÆ.

Saxicava. 14 species; Sowerby, Thesaur. Conch. pts. 41 & 42, pp. 132-134, pl. cccclxxi. figs. 1-14. *S. spinifera*, sp. n., Savannah Bay, fig. 4.

Panopæa glycymeris (Born) found living in the Bay of Algesiras by G. Dantez, J. de Conch. xxxii. p. 191, and Ancey, Le Nat. No. 64, p. 510.

ANATINIDÆ.

Thracia brazieri, new name for *jacksoniensis* (Sow.), which is preoccupied; Sowerby, P. Z. S. 1883, iv. [1884] p. 465.

Myodora. 10 species from New Zealand known, and notes on their differences; Hutton, P. Linn. Soc. N. S. W. ix. pp. 514-517.

Myochama woodsii, sp. n., Petterd, J. of Conch. iv. p. 145, Tasmania.

PHOLADIDÆ.

Teredo and *Kuphus*; Sowerby, Thesaur. Conch. pts. 41 & 42, pp. 121-125, pl. cccclxix. (21 species).

Teredo (Xylotrya) antarctica (Hutt.), ? from Queensland; E. A. Smith, Zool. Coll. Alert, p. 93, pl. vii. fig. e.

GASTROCHENIDÆ.

Gastrochaena. 29 species described and figured by Sowerby, Thesaur. Conch. pts. 41 & 42, pp. 127-131, pls. cccclxx. figs. 1-27, & cccclxxi. figs. 28 & 29. *G. difficilis*, *gigantea*, and *humilis* (Desh.), figs. 4, 12, & 27, not before figured.

Fistulana. 3 species; *id. t. c.* pp. 131 & 132, pl. cccclxxi. figs. 15-17.

Aspergillum. Abstract of Lacaze-Duthier's anatomical paper [Zool. Rec. xx. *Moll.* p. 96] in J. R. Micr. Soc. (2) iv. pp. 550-552.

SYSTEMATIC PLACE UNKNOWN.

Clamyoconcha [*Chlam.*], g. n. Shell internal, without adductors. *C. orcutti*, sp. n., from San Diego. Preliminary notice by W. Dall, Science, iv. No. 76, p. 50 [abstract in J. R. Micr. Soc. (2) iv. p. 727].

Pygotheca (Fischer, MS.), g. n. of Bivalves. *P. fragilis*, sp. n., on the ground of the Sargasso Sea, indicated but not described by A. Milne-Edwards in his preliminary report on the Expedition of the 'Talisman' in Bull. hebdom. Ass. Sci. Fr. 1884 (Dec. 1883), p. 27.

BRACHIOPODA.

BY

PROF. EDUARD VON MARTENS, M.D., C.M.Z.S.

ANATOMY AND PHYSIOLOGY.

M. A. SCHULGIN gives an anatomical description of *Argiope*, and comes to the following conclusions :—

- (1.) Only the basal part of the internal skeleton or loop is present in this genus.
- (2.) The shell is not the product of a distinct shell-gland, but is the product of the whole outer surface of the animal.
- (3.) The arm-fringes are homologous to gills, but have no respiratory functions.
- (4.) Heart and distinct blood-vessels are absent; the circulation is due to the cilia in the peritoneal cavity.
- (5.) The nervous system consists of feebly-developed subœsophageal ganglia, a thin nervous ring, and well-developed peripheral branches.
- (6.) Ten distinct muscles are present, but they offer no distinct homology to those of the Annelids.
- (7.) Although a very faint segmentation can be perceived in the embryo, neither the muscles nor the bristles are in clear relation to the segments, and even the mesoderm does not partake in the segmentation; the bristles are confined to the future mantle of the animal, as in *Chiton*.
- (8.) The breeding pouch only can be considered as homologous with the segmental organs of the Annelids, but a similar organ is also found in *Pellicellina*, among the *Polyzoa*; the central portion of the nervous system has the same place in *Argiope* and in *Pediacellina*, and the arm-disk of the *Brachiopoda* is homologous with the lophophore of the *Polyzoa*.

The author is inclined to unite the *Brachiopoda* and the *Polyzoa* as a distinct type, "*Vermoides*." Z. wiss. Zool. xli. pp. 116-141, pls. viii. & ix.

The digestive and generative organs of *Crania* are the subject of a paper by JOUBIN, C.R. xcix. pp. 985-987.

H. G. BEYER treats of some points in the microscopical structure of *Lingula*; Am. Micr. J. v. pp. 187 & 188.

TEREBRATULIDÆ.

Megerlia truncata var. n. *inflata*, Sciacca, Sicily, on corals; Del Prete, Bull. Soc. mal. Ital. ix. p. 255.

Argiope granuliformis, Sardinia and Hyères Islands, *barroisi*, sp. n., Villafranca, and *kowalevskii*, sp. n., = *neupolitana* of Scacchi and Dall, Sardinia, Villafranca, Hyères, Naples; a variety of it with three large furrows; Schulgin, Z. wiss. Zool. xli. pp. 121 & 122, pl. viii. figs. 2, 4, & 5, the known species *decollata* (Chemn.) and *cuneata* (Risso), figs. 1 & 3.

Megathyris (*Argiope*). 10 spp. nn., Morgan, Bull. Soc. Z. Fr. viii. pp. 371-376.

RHYNCHONELLIDÆ.

The shell of *Rhynchonella psittacea* contains a mere trace of phosphate of lime, but 91-94 per cent. of carbonate; Dall, Am. Nat. xviii. p. 778.

Atretia gnomon (Jeffr.) found in 1537 fath., lat. 39° N., long. 70° W., beneath the Gulf Stream; Verrill, Am. J. Sci. (3) xviii. p. 381, footnote.

POLYZOA.

BY

PROF. EDUARD VON MARTENS, M.D., C.M.Z.S.

LIST OF PUBLICATIONS.

- BUSK, G. Report on the *Polyzoa* collected by H.M.S. 'Challenger,' during the years 1873-76. The *Cheilostomata*, in Voyage of H.M.S. 'Challenger,' Zoology, x. 4to, 216 pp., 36 pls.
- HINCKS, T. Report on the *Polyzoa* of Queen Charlotte Islands. Ann. N. H. (5) xiii. pp. 49-58, pls. iii. & iv. and pp. 203-215, pl. ix.
- . Contributions towards a General History of the Marine *Polyzoa*. XII. *Polyzoa* from India; XIII. *Polyzoa* from Victoria. Ann. N. H. (5) xiii. pp. 356-369, pls. xiii. & xiv., and xiv. pp. 276-284, pls. viii. & ix.
- KRAEPELIN, K. Zur Biologie und Fauna der Süßwasserbryozoën. Zool. Anz. vii. pp. 319 & 320.
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- . On *Paludicella erecta*. T. c. pp. 213 & 214. [Also in Ann. N. H. (5) xiv. pp. 437-439.]
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- VIGELIUS, W. J. Morphologische Untersuchungen über *Flustra membranaceo-truncata*. Biol. Centralbl. iii. No. 23, pp. 705-721.
- . Bryozoen von der Ooster-Schelde. Tijdschr. Nederl. Dierk. Ver. Suppl. v. pp. 546-549.
- WATERS, A. W. Closure of the Cyclostomatous *Bryozoa*. J. L. S. xvii. No. 103, pp. 400-404, pl.

MORPHOLOGY AND PHYSIOLOGY.

W. J. VIGELIUS describes the morphology of *Flustra*, acknowledging only two forms of individuals, the feeder and the avicularian; of the former there are 4 kinds—(1) those in course of budding in the marginal zone; (2) the full-grown ones, which are capable of reproduction, and can lose and regenerate their digestive organs; (3) the inactive individuals, in which the brown body persists for some time; and (4) the dead individuals, in which all organs are disappearing; the two latter are found near the base of the colony. The egg-bearing capsules, and the adhesive tubes, or root-filaments, are not to be regarded as individuals. The Cystid and the Polypid are inseparable from one another, and form together one feeding individual; each consists of three parts—(1) the skin; (2) the nutritive apparatus, tentacles, and intestinal tract; (3) the parenchymatous tissue, the parietal layer of which is the endocyst, producing the ovary and the testicle. A nervous system is not certainly known. The ovicell is an organ in the formation of which two neighbouring zoecia partake, and is therefore not an individual. The sexes are generally separated; the sexual products develop themselves independently of the polypid, and fecundation is probably effected in the ovicell. The brown body serves as food. Avicularia and vibracula are modifications of the entire polypocystid, not of the cystid alone. Further, the development of the buds is described, in conformity with the statements of Nitsche, except in the very first stages. Biol. Centralbl. iii. pp. 705-721; abstr. in Arch. Z. expér. (2) ii. pp. xxvi-xxix., and in J. R. Micr. Soc. (2) iv. p. 371.

Concerning the median or central pore of many *Polyzoa*, G. BUSK has seen, in a specimen of *Tesseradoma* (*Onchopora*) *boreale*, a cylindrical chitinous rod or tubule of a dark brown colour protruding from it, upon the extremity of which a small *Rotalina* was firmly affixed. This pore may therefore serve for the emission of a prehensile organ, at least in some cases. Zool. Challng. x. p. 175.

Explanation of several terms employed in his paper on the *Polyzoa*; *id. t. c.* pp. xvi.-xxi.

GEOGRAPHICAL DISTRIBUTION.

About 266 species of *Polyzoa-Cheilostomata* have been collected during the voyage of H.M.S. 'Challenger,' in 1873-76, 180 of which are new, or have only been lately named and described by G. BUSK, Zool. Challng. x., 216 pp., 36 pls. There are no very peculiar abyssal forms among them, but a few species have a remarkably wide geographical and bathymetrical range.

Oosterschelde, Netherlands. 9 species of *Polyzoa*, by W. J. VIGELIUS, Tijdschr. Nederl. Dierk. Ver., Suppl. D, pp. 546-549.

Limfjord, Jutland. *Flustra membranacea*, *Membranipora membranacea* and *flemingii*, *Discoporella verrucaria*, *Crisia eburnea*, and *Cellularia scabra*; COLLIN, Limfjordens marine Fauna, p. 24.

Baltic. *Membranipora pilosa* var. *membranacea*, Sm., is the only Poly-

zoon found in the Finnish inlet of the Baltic; M. Braun, Arch. Nat. Liv. (2) x. pp. 98 & 111.

Queen Charlotte Islands, N.W. America. Description of *Polyzoa* continued and finished, by T. Hincks, Ann. N. H. (5) xiii. pp. 49-58, pls. iii. & iv., and pp. 203-215, pl. ix. : in all 96 species, 36 hitherto undescribed, 24 at least distinctively Arctic forms, 17 are British, some species cosmopolitan (*Microporella ciliata*, *Schizoporella hyalina*, *Smittia trispinosa*, and perhaps *Hippothoa distans*), 7 essentially Southern American, 17 common with Australia; *id. t. c.* pp. 213 & 214.

Indian Ocean. 18 species of *Polyzoa* from Mergui, Coast of Burmah, among which several species occur also in Europe and in the West Indies; Ann. N. H. (5) xiii. pp. 356-362, pl. xiv.

Australia. Localities in New South Wales for 16 species determined by Dr. Kirchenpauer, enumerated by F. von MÜLLER, P. Linn. Soc. N. S. W. ix. pp. 535 & 536. *Polyzoa* from Victoria and Western Australia collected by J. B. Wilson, determined by HINCKS, Ann. N. H. (5) xiii. pp. 363-369, pl. xiv. From Victoria alone; *op. cit.* xiv. pp. 276-284, pls. viii. & ix. New species of *Discoporella* and *Fasciculipora*; MACGILLIVRAY, P. R. Soc. Vict., April, 1884, 1 pl.

Fresh-water *Polyzoa* of North America [see *Paludicella*, *Pectinatella*, *Cristatella*, and *Urnatella*].

CHILOSTOMATA.

G. BUSK arranges the families as follows:—

Division I. *Stolonata*. Fam. *Aetidae*, *Eucriteidae*, *Chlidoniidae*.

Division II. *Radicellata*.

Subdivision (A) *Cellularina*. Fam. *Catenariidae*, *Cellulariidae*, *Bicellariidae*, *Gemellariidae*, *Farciminiariidae*.

Subdivision (B) *Flustrina*. Fam. *Flustridae*, *Membraniporidae*, *Microporidae*, *Electrinidae*.

Subdivision (C) *Escharina*. Fam. *Bifaxiariidae*, *Salicornariidae*, *Tubucellariidae*, *Onchoporidae*, *Reteporidae*, *Cribriliniidae*, *Microporellidae*, *Escharidae* (a) *holostomata*, (b) *schizostomata*, *Adeoneae*, *Celleporidae*, *Selenariidae*.

Zool. Challeng. x. pp. xxii. & xxiii. [We shall adopt this arrangement in the following enumeration.]

EUCRATEIDÆ.

Hippothoa flagellum (Manzoni), off Heard Island; *id. t. c.* p. 4, pl. xxxiii. fig. 7.

Pasythea (Lamx, pt.) = *Epicaulidium* (Hincks) = *Gemellipora* (Smitt, pt.); *P. eburnea* (Smitt), off Culebra Island, off Sombbrero Island, and off Barra Grande, Brazil, 32-400 fath.: *id. t. c.* pp. 4-6, pl. xxxiv. fig. 1.

Brettia australis, sp. n., Australian region, lat. 0° 48' S., long. 126° E., 825 fath., and *cornigera*, sp. n., Sombbrero Island, 450 fath.; *id. t. c.* p. 7, pl. xxxiv. fig. 6.

CHLIDONIIDÆ.

New family. Zoecium composed of upright, free, segmented stems, springing from a stolonate network. From the segments, after the first bifurcation, arise lateral branches consisting of chains of zoecia, arising from the back near the summit; zoecia bicamerate, unarmed. Only genus: *Chlidonia* (Savigny, 1811; Orbigny, 1850). *C. cordata* (Audouin, Descr. Eg. 13, 3, *Eucratea*) = *Cothurnicella dædala* (Wyv.-Thoms.), Atlantic and Mediterranean; a variety from Cape York, 8-11 fath.: Busk, Zool. Challeng. x. pp. 8 & 9, pl. xxviii. fig. 11.

CATENICELLIDÆ.

Catenicella cribraria (Busk), Port Phillip, *maculata*, sp. n., off Barra Grande, Brazil, 350 fath., *elegans* (Busk), South Atlantic, *umbonata* (Busk), and *pulchella* (Mapelstone), Port Jackson; *id. t. c.* pp. 11-13, pl. i. figs. 1-7.

Catenaria (Savigny, 1811 on pl.; Orbigny). Zoarium erect or free, dichotomously branched; the zoecium at each bifurcation single. Zoecia elongate, subtubular or trumpet-shaped, without a frontal aperture; mouth orbicular or semi-orbicular. Typical species, *Eucratea lafontii* (Aud. Descr. Eg. 13, 2). *C. attenuata*, sp. n., off Heard Island, 72 fath., *bicornis*, sp. n., Pacific, lat. 18° S., long. 149° W., 1940 fath., *diophana* (Busk), St. Paul Rocks, Atlantic, shallow water. *Id. t. c.* pp. 14 & 15, pl. ii. figs. 1-3.

CELLULARIIDÆ.

Cellularia crateriformis, lat. 35 & 36° S., long. 46-50° W., 1900-2650 fath., *cirrata*, Tropical Pacific, 1425 fath., *quadrata*, Kerguelen and Heard Islands, 28 & 79 fath., *biloba*, lat. 38° N., long. 27° W., 900 fath., and *elongata*, Kerguelen, 28 fath., all spp. nn., *id. t. c.* pp. 16-19, pl. iii. figs. 1-5.

Menipea compacta (Hincks, 1882). Internodes composed of three cells mingled with others bearing five or six; Hincks, Ann. N. H. (5) xiii. p. 209, pl. ix. fig. 8. *M. benemunita*, sp. n., S. Atlantic, 12-1325 fath., *aculeata* (Orb.) S. Pacific, 12-1325 fath., *clausa*, sp. n., N. Atlantic, 1675 fath., *flagellifera*, sp. n., Kerguelen and Marion Islands, 20-127 fath., *marionensis*, sp. n., Marion Island, 50-75 fath., and *pateriformis*, sp. n., S. Pacific, 2160 fath.; Busk, *t. c.* pp. 19-22, pls. iv. figs. 1-5, v. fig. 4, & xiv. fig. 9. *M. marginata*, sp. n., Hincks, Ann. N. H. (5) xiv. p. 276, pl. ix. fig. 1, Victoria.

Scrupocellaria macandrei (Busk), Cape Verde Islands and St. Paul, *ciliata* (Aud.), Australia, *pilosa* (Aud.), S. Indian Sea, 75 & 110 fath., *securifera*, sp. n., Admiralty Islands; Busk, *t. c.* pp. 23-25, pl. xi. figs. 2 & 7.

Canda ? *simplex*, sp. n., N. Atlantic, 1700 fath., *id. t. c.* p. 26, pl. xiv. fig. 8.

Caberea, generic characters; *rostrata*, sp. n., Australian region, 150 fath.,

crassimarginata, sp. n., S. Atlantic, 600 fath.; *darwinii*, new name for *patagonica* (Busk, Cat. Brit. Mus.), Tristan d'Acunha, Kerguelen, and Marion, 110-210 fath.; *minima*, sp. n., S. Atlantic, and *lata* (Busk), Australian region: Busk, *t. c.* pp. 27-30, pls. xi. figs. 1 & 3, & xxxii. figs. 4-6.

BICELLARIIDÆ.

Bicellaria navicularis, sp. n., S. Atlantic, 400-2200 fath., *pectogemma* (Goldst.), S. Indian Ocean, 75-150 fath., *infundibulata*, sp. n., S. Indian Ocean, 1600-1975 fath., *bella*, sp. n., *macilenta*, sp. n., and *moluccensis*, sp. n., Moluccas, 825 fath., *glabra* (Hincks, *Stirparia*), off Bahia, 10-12 fath.; *id. t. c.* pp. 32-36, pls. vi. figs. 1-4, vii. figs. 1 & 2, & xxxii. fig. 1.

Bugula versicolor, sp. n., Sombrero Island, 450 fath., *leontodon*, sp. n., N. Atlantic, 1525 fath., *sinuosa*, sp. n., Prince Edward Island, 80-150 fath., *mirabilis*, sp. n., N. Atlantic, 2400 fath., *reticulata*, sp. n., S. Indian Sea and S. Pacific, 600-2160 fath., *vicornis*, sp. n., S. Indian Sea, 1950 fath., *margaritifera*, sp. n., S. Atlantic, 1900-2200 fath., and *longissima*, sp. n., Kerguelen and Heard Islands; *id. t. c.* pp. 37-42, pls. iii. fig. 4, viii. figs. 3 & 4, ix. fig. 1, x. figs. 1-3, & xxxi. fig. 7.

Bugula uniserialis, sp. n., Hincks, Ann. N. H. (5) xiii. p. 367, pl. xiii. fig. 8, W. Australia.

Kinetoskias (Koren & Danielsen), generic and historical note; *K. cyathus* (Wyv.-Thoms., *Naresia*), N. & S. Atlantic, 1525 & 2650 fath., zoecia about 0".045-0".02, avicularia 0".02 long, mandible 0".01; and *K. pocillum* (Busk, 1881), S. Atlantic and S. Pacific, 350 & 2160 fath.; *Bugula umbella* (Smitt) = *K. arborescens* (K. D.): Busk, *t. c.* pp. 43-45, pl. viii. figs. 1 & 2.

Ichthyaria, g. n. Zoarium continuous, branched; branches irregularly dichotomous or forked, biserial, zoecia facing in one direction; the two series very loosely connected. Zoecia ventricose rounded, front entirely calcified. *I. oculata*, sp. n., South Atlantic, 70 & 600 fath. *Id. t. c.* p. 46, pl. xiii. fig. 7.

CELLARIIDÆ.

Cellaria fistulosa var. *australis* (McGill.) described; Hincks, Ann. N. H. (5) xiii. p. 368, pl. xiv. fig. 4. *C. mandibulata* (Hincks, 1882) figured by the author; *t. c.* p. 209, pl. ix. fig. 7.

FARCIMINARIIDÆ.

Farciminaria atlantica, off Sombrero and Culebra Islands, 450 & 390 fath., *cribraria*, S. Atlantic, 1900 fath., *magna*, sp. n., S. Atlantic and S. Indian Sea, 1675 & 2650 fath., zoarium 5-6 inches thick, zoecia 0".055-0".07 long, *brasiliensis*, off Barra Grande, Brazil, 350 fath., *pacifica*, N. Pacific, 2300 fath., *gracilis*, N. and Tropical Atlantic, *delicatissima*, N. and Tropical Atlantic, 1850-2400 fath., and *hexagona*, S. Indian and Australian region, 140-1425 fath., all spp. nn.; *id. t. c.* pp. 48-51, pls. v.

figs. 1-3, xiv. fig. 10, & xxxi. figs. 2-6. *F. uncinata*, sp. n., Hincks, Ann. N. H. (5) xiv. p. 277, pl. viii. fig. 2, Victoria.

FLUSTRIDÆ.

Flustra membranacea-truncata (Smitt): general morphology, by Vigilius [vide *suprà*, p. 2].

Flustra crassa, sp. n., Kerguelen, 28 fath., *denticulata* (Busk), Australian region, 150 fath., *biseriata*, sp. n., Australian Sea and S. Pacific, 825 & 2160 fath., *membraniporoides*, sp. n., Port Jackson and Bass Straits, 35-38 fath.; Busk, *t. c.* pp. 53 & 54, pls. xvi. figs. 1 & 6, & xxxii. figs. 2 & 7.

Carbacea ovoidea (Busk), Kerguelen, Prince Edward, and Falkland Islands, *elegans* (Busk), Bass Straits and S. Atlantic, 38 & 70 fath., *pedunculata*, sp. n., N. Atlantic, 490 & 900 fath., *moseleyi*, sp. n., off Kermadec Islands, 520 fath., and *cribriformis* (Busk), Cape York; *id. t. c.* pp. 55-58, pls. xvi. figs. 3-5, xxxiii. fig. 4, & xxxiv. fig. 8.

Diachoris costata (Busk), S. Atlantic, and *mugellanica* (Busk) var. n. *distans*, Heard Island, 75 fath.; *id. t. c.* pp. 59 & 60, pls. xvi. fig. 2, & xxxiv. fig. 4.

MEMBRANIPORIDÆ.

Membranipora albida (Hincks?), Tongatabu, 18-20 fath., and N. Atlantic, 450 fath., *crassimarginata* (Hincks) varr. *erecta* and *incrustans*, Bass Straits, Heard Island, and Tristan d'Acunha, 38-110 fath., *galeata* (Busk) varr. nn. *furcata*, *multifida*, and *erecta*, S. Atlantic; *id. t. c.* pp. 63-65, pls. xiv. fig. 3, & xv. figs. 4 & 5.

Membranipora pallida, sp. n., Queen Charlotte Islands, *M. exilis* (Hincks) ceasing to be adherent and being attached by radial tubes, like *radicifera* (Hincks), both forming a link to the *Bugulidæ*; Hincks, Ann. N. H. (5) xiii. p. 210. *M. favus*, sp. n., *id. t. c.* p. 357, pl. xiii. fig. 2, Mergui. *M. perfragilis* (Macq., *Biflustra*): avicularium described; *id. op. cit.* xiv. p. 278.

Amphiblestrum (Gray) characterized by a partial internal calcareous lamina, and the aperture often more or less trifoliate or ovate; *A. imbricatum*, Simon's Bay, *cristatum*, Kerguelen, 28 fath., zoecium resembling a crested helmet with visor, the marginal spines or their basal joints persist in the fertile zoecia; *pupillatum*, Philippines, and ? *capense*, Simon's Bay, all spp. nn.: Busk, Zool. Challeng. x. pp. 65-67, pls. xv. figs. 1 & 3, xxiii. fig. 3, & xxxiii. fig. 1.

Biflustra savartii (Aud), Philippines; *id. t. c.* p. 67, pl. xiv. fig. 2.

Foveolaria, g. n. Zoecium erect, branched and cylindrical, or foliaceous and bilaminar; front of zoecia with a thick granular border very deeply imbedded in a pit formed by the thickening of the general ecto-cyst; a sessile avicularium immediately below or in front of the lower border of the pit. *F. elliptica*, Bass Straits, 38 fath., and S. Atlantic, 600 fath., *orbicularis*, S. Indian Sea, 1600 fath., *tubigera*, Simon's Bay, and *falcifera*, S. Atlantic, 600 fath. *Id. t. c.* pp. 68 & 69, pls. xiv. fig. 4, xv. fig. 6, & xxiii. figs. 4 & 5.

MICROPORIDÆ.

Micropora nucifera, sp. n., off Nightingale Island and Tristan d'Acunba, 75-150 fath. ; Busk, t. c. p. 71, pl. xv. fig. 7.

Vincularia (Defr.) : generic character. *V. gothica* (Orb.) = *novæ-hollandiæ* (Haswell) = *steganoporoides* (MacGill.), Prince Edward Island, 80-150 fath., and *V. labiata*, sp. n., S. Atlantic, 600 fath. *Id. t. c.* pp. 70-72, woodcut, pl. xxiii. fig. 1.

Caleschara denticulata (MacGill.) var. n. *tenuis*, Bass Straits ; *id. t. c.* p. 77, pl. xxi. fig. 5.

STEGANOPORELLIDÆ.

New family founded on the dithalamic condition of the zoecium, as stated by Jullien, Bull. Soc. Z. Fr. vi. ; Hincks, Ann. N. H. (5) xiii. p. 358.

Steganoporella (Smitt) distinguished by the tubular passage leading from the inner chamber towards the external orifices and the corresponding modification of the internal orifice ("opesia" of Jullien), which, on the contrary, is a simple opening in the calcareous lamina communicating directly with the inner chamber in *Smittipora* (Jullien) and kindred forms. *Id. t. c.* p. 359.

Steganoporella (Smitt) classified among the *Microporidæ*. Generic character. *S. magnilabris* (Busk), Sandwich Islands, 20-30 fath. Busk, t. c. p. 75, pl. xxiii. fig. 2, and woodcut.

ELECTRINIDÆ.

Family proposed by Orbigny in 1851, re-introduced by Busk. Zoarium erect or incrusting, more or less flexible ; zoecia turbinate or subturbinate ; wall punctured ; a wide expanding aperture, the border toothed or furnished with chitinous aculeate spines ; one or more chitinous spines of larger size than the rest articulated on the front of the zoecium below the aperture, or an articulated avicularian process in the same situation ; oecia, when present, galeate. Only 1 genus : *Electra* (Lamx.), character of the family ; list of known species, among which *E. pilosa* (L., *Flustra*) and *cylindracea*, Prince Edward Island, 80-150 fath. *Id. t. c.* pp. 78 & 79, pl. xxxiii. fig. 2.

BIFAXARIIDÆ.

New family, proposed by Busk ; first of the series *Escharina*. Zoarium rigid, continuous or articulated, biserial, variously branched ; zoecia alternate, closely connate back to back and facing in opposite direction. 2 genera, *Bifaxaria* and *Calymnophora*. *Id. t. c.* p. 79.

Bifaxaria, g. n. Zoecia very closely contiguous ; a small circular immersed avicularium on each side of the orifice, sometimes wanting or replaced by a short, hollow, spinous process ; oecia, when present, deeply imbedded in the superjacent zoecium ; a raised ridge or keel on the middle of the front, the upper pointed termination of which

constitutes a more or less prominent mucro in front of the orifice. *B. submucronata* and *corrugata*, S. Atlantic, 350 fath., *levis*, Philippines, 500 fath., *papillata*, Australian region, 825 fath., *minuta*, N. Atlantic, 1675 fath., *reticulata*, N. Atlantic, 1900 fath. *abyssicola*, N. Pacific, 3125 fath., and *denticulata*, S. Atlantic, 600 fath., all spp. nn. Busk, *t. c.* pp. 79-82, pls. xiii. figs. 1-8, & xxiv. figs. 3-6.

Calymnophora, g. n. The external chitinous membrane or epitheca, which is in fact the remains of the original germinal membrane from which the incipient budding zoecia are solely formed, is completely detached, except at a few points, from the proper calcified wall, and forms a beautifully transparent veil over the entire growth, passing as it were uninterruptedly from one zoecium to another and enclosing the oecia; mouth completely terminal. *C. lucida*, sp. n., Australian region, off Twofold Bay, 150 fath. *Id. t. c.* p. 83, pl. xxxii. fig. 3.

SALICORNARIIDÆ.

Characters of the family; Busk, Zool. Challeng. x. pp. 83 & 84.

Salicornaria malvinensis (Busk), Kerguelen, Marion, and Falkland Islands, 12-45 fath., *clavata*, Kerguelen, Heard Island, Prince Edward Island, Bass Strait, and Port Jackson, 28-75 fath., *simplex*, Bass Strait, 38 fath., Kerguelen and S. Atlantic, 25-70 fath., *divaricata*, Australian region, 150 fath., *dubia*, S. Atlantic, 600 fath., spp. nn., *bicornis* (Busk), Australian region, 150 fath., and *magnifica*, sp. n., inarticulate, 1-2 inches high, Atlantic and S. Indian Sea, 350-1950 fath.; *id. t. c.* pp. 85-95, pls. xii. figs. 1-8, xiv. fig. 1, & xxiii. figs. 8-10, and many woodcuts.

Melicerita (Milne-Edw.) = *Melicertina* (Ehrenb.) = *Ulidium* (S. Wood). Zoarium compressed; hitherto only known in fossil state. *M. atlantica* and ? *dubia*, spp. nn., both in the S. Atlantic, 900 fath. *Id. t. c.* pp. 95-98, pls. xiv. fig. 1, & xxxiii. fig. 10.

TUBUCELLARIIDÆ.

New family proposed by Busk, including *Tubucellaria* and *Siphonicytara*.

Tubucellaria (Orb.): generic character. *T. opuntioides* (Pall.), St. Paul's Rocks, Atlantic, shallow water, and *hirsuta* (Lamx., *Cellaria*), Australia, 150 fath. *Id. t. c.* pp. 99-101, pls. xxiv. fig. 7, & xxxvi. figs. 18 & 19.

Siphonicytara, g. n. Zoarium continuous, radicate, branched, branches alternate, subcylindrical, quadriseriate, subsecund; zoecia completely immersed below, flattened in front peristome tubular, extended; a circular median pore below the middle of the front; a large circumanfract (avicularium?) near the top of most of the lateral zoecia regular border, *seriata*, sp. n., N. Australia, 825 fath. *Id. t. c.* p. 101, pl. xv. fig. 2.

ONCHOPORIDÆ.

New family proposed by Busk. Zoarium flexible, continuous, branched or lobate, ligulate or foliaceous, then unilaminar; zoecia urceolate,

ventricose; orifice semicircular with a straight entire lower lip; on the front, close below the orifice, a lunate fringed pore, and on each side an oblong or circular perforated disc, with a raised border. Genera *Onchopora* and *Onchoporella*. Busk, *t. c.* p. 102.

Onchopora sinclairii (Busk) = *Malakosaria pholaramphæa* (Goldst.), Heard Island and Kerguelen; *id. t. c.* p. 103, pl. x. fig. 4.

Onchoporella, g. n. Zoarium foliaceous, unilaminar, ligulate or lobed. *O. bombycina* (L., *Flustra*), Simon's Bay, Cape of Good Hope. *Id. t. c.* pp. 103 & 104.

RETEPORIDÆ.

Retepora. List of 31 known species, and the following new:—*apiculata* and *producta*, Tongatabu, 18 fath., *denticulata*, Sandwich Islands, 20–40 fath., *imperati*, already figured by Imperato in 1551, = *Millepora foraminosa* (Ell. & Sol.), Mediterranean and Cape Verde Islands, *gigantea*, S. India Sea, off Possession Island, 210 fath., *lata*, Simon's Bay, *crassa*, Port Phillip and Bass Strait, 33–38 fath., *atlantica*, N. Atlantic, 450 fath., *victoriensis*, off Port Phillip, 33 fath., with var. *japonica*, Japan, 8–50 fath., *simplex*, Samboanga and Admiralty Islands, *hirsuta*, off Cape York, 8 fath., *mucronata*, Philippines, 18 fath., *contuplicata*, off Honolulu, 20–40 fath., *cavernosa*, S. Indian Sea, 210 fath., *tubulata*, off Cape York, 8 fath., *columnifera*, Australia, 9° S. lat., 49 fath., *philippinensis*, Philippines, 10–20 fath., *delicatula*, Australian region, 45 fath., *margaritacea*, Australia, 18° S. lat., 1450 fath., *jacksoni*, Port Jackson, 2–10 fath., and *magellensis*, S. Atlantic, 600 fath., all spp. nn., *id. t. c.* pp. 105–126, pls. xxvi.–xxviii. & xxxvi. fig. 20.

Reteporella, subg. n. of *Retepora*. Branches free in one plane. *R. flabellata*, sp. n., off Heard Island, 75 fath., and ? *myriozoides*, sp. n., S. Indian Sea, 210 fath. *Id. t. c.* pp. 126 & 127, pls. xxv. fig. 5, & xxiv. fig. 2.

Turritigera, g. n. Zoarium ramose, arising from a calcareous expansion, encrusting foreign bodies, having the openings of the zoecia usually on one side only; zoecia ventricose or flask-shaped, much produced and subtubular above, with several conical or columnar avicularian processes on the peristome. *T. stellata*, sp. n., S. Atlantic, 600 & 150 fath. *Id. t. c.* pp. 129 & 130, pl. xxiv. fig. 1.

CRIBRILINIDÆ.

Cribrilina ^{and} *close* (Macq.): young colony; Hincks, Ann. N. H. (5) xiv. p. 279, pl. 2, fig. 5. *C. latimarginata*, sp. n., S. Atlantic, 600 fath., near the Tertiary *Celleporaria radiata* (Reuss.), *philomela*, sp. n., off Marion Island, 50–75 fath., *labiosa* (Busk) var. n. *fragilis*, Simon's Bay, and *monoceros* (Busk, *Lepralia*), Port Jackson and S. Atlantic, from 12–3125 fath.; Busk, *t. c.* pp. 131–134, pls. xvii. fig. 6, xix. figs. 4 & 8, & xxii, figs. 7 & 10.

MICROPORELLIDÆ.

Microporella. 3 known species from the 'Challenger' collections; Busk, *t. c.* p. 137. *M. violacea* (Johnst.) form *plagiopora* (Busk), and *M. fuegensis* (Busk), described; Hincks, Ann. N. H. (5) xiii. pp. 359 & 360, from specimens collected at Mergui, the former pl. xiii. fig. 3.

Flustramorpha marginata (Krauss), off Marion Island, 30-170 fath., and *hastigera*, sp. n., N. Atlantic, 450 fath.; *id. t. c.* pp. 135 & 136, pls. xx. fig. 8, & xxi. fig. 7.

PORINIDÆ.

Porina magnirostris (Macg., *Lepralia*), Hincks, Ann. N. H. (5) xiv. p. 279, pl. ix. fig. 6, Victoria.

Lagenipora. Generic character emended; zoecia lageniform with a free orbicular orifice and destitute of a special pore. *L. spinulosa*, sp. n., Queen Charlotte Islands. *Id. op. cit.* xiii. pp. 56 & 57, pl. iii. fig. 4, & pp. 210 & 211, pl. ix. fig. 4.

CYLICOPORIDÆ.

New family, characterized as follows:—Zoecia having the front wall wholly calcified and destitute of raised margins or depressed area, with a more or less orbicular orifice. Only 1 genus and species known. *Cylicopora*, g. n.: zoecia with a perfectly simple orifice more or less orbicular; zoarium incrusting. *C. prælonga*, sp. n., Port Phillip Heads, Australia. *Id. t. c.* p. 280, pl. ix. fig. 7.

ESCHARIDÆ HOLOSTOMATA.

Eschara elegantula (Orb.) = *saccata* (Busk), N. Atlantic, 51 fath., and *gracilis* (Lam.), Bass Strait, 38 fath.; Busk, *t. c.* pp. 141 & 142, pls. xx. fig. 6, & xxi. fig. 6.

Lepralia celleporoides, Australia, 10° S. lat., 8 fath., *japonica*, Japan, 8-50 fath., *tuberosa*, off Port Jackson, 34 fath., *dorsiporosa*, Cape York, 8 fath., *feegeensis*, Philippines, 18 fath., *incisa*, Tristan d'Acunha, 60-90 fath., *lonchæa*, Admiralty Islands, all spp. nn., and *marsupium* (MacGill.), S. Atlantic, *id. t. c.* pp. 141-147, pls. xvii. figs. 4, 5, & 7, xviii. fig. 4, xx. fig. 6, xxi. fig. 6, & xxii. fig. 9, and several woodcuts.

Lepralia bilabiata and *claviculata*, spp. nn., Hincks, Ann. N. H. (5) xiii. pp. 49 & 50, pl. iii. fig. 42, Queen Charlotte Islands. *L. cleidostoma*, var. n., *id. t. c.* p. 212, same locality. *L. robusta*, sp. n., *id. t. c.* p. 360, pl. xiii. fig. 4, Mergui. *L. bifrons*, sp. n., *id. op. cit.* xiv. p. 281, pl. viii. fig. 3, Port Phillip Heads.

Chorisopora hyalina var. n. *bougainvillei* (Orb.), Kerguelen and Tristan d'Acunha, and *honoluluensis*, off Honolulu, 20-40 fath., Busk, *t. c.* pp. 148 & 149, pl. xxii. figs. 4 & 12.

Porella laevis var. *subcompressa* (Hincks), Cape Verde Islands, 100-150 fath.; *id. t. c.* p. 149, pl. xx. fig. 6.

Porella argentea, sp. n., Hincks, Ann. N. H. (5) xiii. p. 212, pl. ix. fig. 1, Queen Charlotte Islands. *P. marsupium* (MacGill.) var. n. *porifera*, and *P. major*, sp. n.; *id. t. c.* pp. 50 & 51, pl. iv. figs. 4 & 5, Queen Charlotte Islands. *P. calceolus*, sp. n., *id. t. c.* p. 361, pl. xiii. fig. 5, Mergui.

Escharoidea oclusa, sp. n., South Indian Sea, 210 fath., Cape York, 8 fath., and Philippines, 10 fath., Busk, *t. c.* p. 150, pl. xxi. fig. 8.

Smittia spathulifera, sp. n., Hincks, Ann. N. H. (5) xiii. p. 52, pl. iv. fig. 3, Queen Charlotte Islands. *S. trispinosa* (Johnst.) var. n. *bimucronata*, Indian Sea and Australia, and other varieties; *id. t. c.* pp. 361 & 362, pl. xiii. fig. 6. *S. tenuis*, off Bahia, 10-20 fath., *smittiana*, South Atlantic, 600 fath., *marsupialis*, off Honolulu, 20-40 fath., *transversa*, Twofold Bay, Australia, 150 fath., *jacobensis*, Cape Verde Islands, 100-120 fath., and Marion Island, 50-75 fath., *oratavensis*, Teneriffe, *stigmatophora*, South Atlantic, 12 fath., and *graciosa*, South Indian Sea, 210 fath., all spp. nn., and *marionensis* (Busk), Marion, Prince Edward Island, and Kerguelen, 28-150 fath.; Busk, Zool. Challeng. x. pp. 150-154, pls. xvii. fig. 3, xviii. figs. 1, 6, & 7, xix. fig. 7, xx. fig. 1, & xxii. figs. 1, 6, & 13. *S. reticulata* (MacGill.) var., *landsborovii* form *personata*, and *trispinosa* (Johnst.) varr. from Victoria; Hincks, Ann. N. H. (5) xiv. pp. 283 & 284, pl. ix. figs. 2-5.

Mucronella praelucida and *praelonga*, spp. nn., and *spinosissima* (Hincks) new form *major*; *id. op. cit.* xiii. pp. 52-55, pl. iv. figs. 1-3, Queen Charlotte Islands. Additional note to the third; *id. t. c.* p. 213. *M. contorta* (Busk), Simon's Bay, *pyriformis*, off Port Phillip, 33 fath., *quadrata*, Tongatabu, 18 fath., *delicatula*, Honolulu, 20-40 fath., *rostrigera*, Prince Edward's Island, 80-150 fath., *castanea*, off Bahia, 10-20 fath., *magnifica*, Honolulu, 20-40 fath., *simplicissima*, Port Phillip, 33 fath., all spp. nn., *bisinuata* (Smitt, *Escharella*), Australia, 8° S. lat., 49 fath., *canalifera*, new name for *Lepralia magnevilla* (Busk, nec Aud.), North Atlantic, 450 fath., *tricuspis* (Hincks), Simon's Bay and Prince Edward's Island, and *ventricosa* var. *multispinata* (Busk), Prince Edward's Island, 80-150 fath.; Busk, *t. c.* pp. 155-161, pls. xvii. fig. 8, xviii. figs. 2, 3, & 5, xix. figs. 2, 5, & 6, xx. figs. 5 & 9, & xxii. figs. 3, 5, & 11.

Aspidostoma giganteum (Busk, *Eschara*) = *crassum* (Hincks, 1881), Tristan d'Acunha, 110-150 fath. Layers double, not unseparably united as in *Eschara*, but merely in opposition; it belongs therefore rather to the Hemescharine type. *Id. t. c.* pp. 160 & 161, pl. xxxiii. fig. 3.

ESCHARIDÆ SCHIZOSTOMATA.

Schizoporella biaperta (Michelin). Mergui specimen; Hincks, Ann. N. H. (5) xiii. p. 360. *S. marsupium* (Ridley, 1881) = *ridleyi* (MacGill.) = *simplex* (Orbigny, 1839-46, *Escharina*); *id. t. c.* xiii. p. 51. J. J. Quelch states that *simplex* (Orb.) is distinct from *ridleyi*, and proposes the new name *S. johnstoni* for *simplex* (Johnst., 1847, nec Orb.); *t. c.* pp. 215-217. *S. dawsoni* (Hincks, 1883) = *torquata* (Orb.); Hincks, *t. c.* p. 212, pl. ix. fig. 2.

Schizoporella furcata, off Honolulu, 20-40 fath., *nivea*, South Atlantic, 150 fath., *longispinata*, South Pacific, 53° S. lat., 10-15 fath., *jack-*

soniensis, Port Jackson, 35 fath., *tenuis*, Honolulu and Simon's Bay, *marsupifera*, Marion Island, 50-75 fath., and Australia, 39° S. lat., 150 fath., all spp. nn., *auriculata* (Hassall) var. *n. alba*, Tristan d'Acunha, 75-110 fath., *elegans* (Orb.), South Indian Sea, 150-210 fath., *circinata* (MacGill.), Tristan d'Acunha, 75-90 fath.; Busk, *t. c.* pp. 163-167, pls. xvii. figs. 1 & 2, xix. figs. 1 & 3, xx. fig. 10, xxi. fig. 5, & xxii. figs. 8 & 14. *S. subsinuata* and *biturrita*, spp. nn., Port Phillip Heads, and note on *S. insignis* (MacGill.); Hincks, Ann. N. H. (5) xiv. pp. 280 & 281.

Gephyrophora, g. n. Zoarium dimorphous, either erect and irregularly branched and cylindrical, with the zoecia disposed round an imaginary axis, or decurrent, loosely encrusting, and unilaminar; zoecia completely immersed, flat in front, parted by septal ridges; surface beneath the epitheca finely reticulate; primary orifice arcuate, with the lower border slightly sinuated, afterwards transversely oblong; a prominent avicularian process on each side of the orifice, the two eventually arching in and forming a bridge in front of it. *G. polymorpha*, sp. n., South Indian Sea, 150 fath. Busk, *t. c.* p. 167, pl. xxxiv. fig. 2.

Myriozoum. In all species a great tendency to the obliteration of the zoecia in the older parts; when a portion of the completely solidified part is decalcified, the chitinous opercula and shrunken remains of the endocyst may often be found in the interior. Three known species, with cylindrical branches of nearly uniform diameter throughout, and obtusely rounded at the ends, and four new of less typical form, viz., *honoluluense*, Honolulu, 20-40 fath., *immersum* and *simplex*, South Atlantic, 600 fath., *marionense*, Marion, Heard, and Prince Edward's Islands, 50-210 fath., these 4 spp. nn. *Id. t. c.* pp. 168-171, pls. xxv. figs. 1, 2, & 4, & xxiii. fig. 6.

Haswellia, g. n. Zoarium composed of short cylindrical branches, spreading in all directions dichotomously, at very open angles; zoecia disposed verticillately and more or less irregularly quincuncial, with a produced tubular or subtubular and bifid, or simply thickened peristome, supporting on each side a small avicularium with a pointed subtriangular mandible; primary mouth clithriate (keyhole-shaped), with an operculum of corresponding form. *H. australiensis* (Haswell, *Myriozoum*), Arafura Sea, 8-49 fath., and *auriculata*, sp. n., Tristan d'Acunha, 75-150 fath. *Id. t. c.* pp. 171-173, pl. xxiv. figs. 9 & 10.

Tesseradoma (Norman) = *Quadricellaria* (Sars) = *Anarthropora* (Smitt), quite distinct from the typical *Porina* (Orb.); *T. boreale* (Busk, *Onchopora*), synonymy, North Atlantic, 450 and 1900 fath.: *id. t. c.* p. 174, pl. xxiv. fig. 8.

Gemellipora glabra (Smitt), off Bahia, 10-20 fath., and *cribriotheca*, Simon's Bay, South Africa, sp. n.; *id. t. c.* p. 176, pls. xxv. fig. 3, & xxxiii. fig. 5.

ADEONEE.

New family proposed by Busk. Three distinct forms of cells—zoecial, oöcial, and avicularian. The zoecia have in the front a median pore,

usually simple and circular, sometimes irregularly fimbriate or represented by a depressed perforated areola. No oecia of the usual type, whose function appears to be discharged by special cells, usually marginal, but sometimes interspersed amongst the others, which have a punctate wall and in most cases a suboral pore (or placed immediately below the mouth), and usually a minute avicularium on each side. Avicularian cells, that is to say, cells which are wholly converted into vicarious avicularia with large mandibles, usually on the extreme border of the lobes, branches, or fenestræ, in several species, if not in all. The avicularian mandibles, both large and small, always exhibit a projecting point or articular process at each end of the base, into or close to which the erector muscles are attached; the occlusor muscle is always single instead of consisting of two bands as usual. List of species, 18 known, and 20 added by the 'Challenger' collections. Busk, *t. c.* pp. 177-180, pl.

Adeona appendiculata, sp. n., Australia, 37° S. lat., 150 fath., *id. t. c.* p. 181, pl. xxxiii. fig. 6, and woodcuts, p. 182.

Adeonella, g. n. Zoarium erect, very variously branched or lobate, attached by a contracted base or pedicle, often containing radical fibres, and affixed usually on a more or less flexible support. *A. polymorpha*, sp. n., Samboanga, 10 fath., *plataleu* (Busk, *Eschara*), Sooloo Sea, 82-102 fath., *intricaria*, Arafura Sea, 49 fath., *atlantica*, Tristan d'Acunha, 75-110 fath., *regularis*, South Atlantic, 150 fath., spp. nn., *distoma* (Busk, *Lepralia*), North and Tropical Atlantic, 450 fath., *pectinata*, sp. n., Arafura Sea, 8 fath. *Id. t. c.* pp. 183-189, pls. xx. figs. 2, 4, & 7, & xxi., figs. 1-4, and many woodcuts.

Reptadeonella, g. n., proposed for *Lepralia violacea* (Johnst.), but not defined; *id. t. c.* pp. 178 & 180.

CELLEPORIDÆ.

Cellepora hastigera and *columnaris*, Bass Strait, 38 fath., *tuberculata*, *apiculata*, and *bidenticulata*, off Port Jackson, 35 fath., *aspera*, South Atlantic, 350 fath., *honolulensis* and *polymorpha*, off Honolulu, 20-40 fath., *imbellis*, off Bahia, 10-20 fath., *samboangensis*, Samboanga, 10 fath., *discoidea* and *tridenticulata*, off Cape York, 8 fath., *vagans*, South Atlantic, 210 fath., and Sandwich Islands, 20-40 fath., *rudis*, South Atlantic, 600 fath., *solida*, South Australian Sea, 2600 fath., *simonensis* and *conica*, Simon's Bay, South Africa, *pustulata*, Marion Island, 50-75 fath., *cylindri-formis*, South Indian Sea, 150 fath., *eatonensis*, Kerguelen and South Atlantic, 28-1325 fath., *ovalis* and *ansata*, North Atlantic, 450 fath., *bicornis*, Prince Edward's and Marion Islands and South Atlantic, 50-150 fath., *bilabiata*, off Port Phillip, 33 fath., *signata*, South Pacific, 45 fath., *canaliculata*, North Atlantic, 51 fath., all spp. nn., *albirostris* (Smitt), off Heard Island, 75 fath., *mamillata* var. *atlantica* (Busk), off Bahia, 10-20 fath., and South Atlantic, 210 fath., *granum* (Hincks), Bass Strait, 38 fath., and *tubulosa* (Hincks), Tristan d'Acunha, 75 and 110 fath.; *id. t. c.* pp. 190-205, pls. xxviii., xxix., xxx., xxxiv., xxxv., & xxxvi.

Cellepora sp. from Queen Charlotte Islands; Hincks, *Ann. N. H.* (5) xiii. p. 56.

SELENARIIDÆ.

Cupularia guineensis (Busk), Arafura Sea, and *monotrema*, sp. n., off Bahia, 10–20 fath.; Busk, *t. c.* pp. 206 & 207, pl. xiv. figs. 5 & 6.

Lunularia cupulus (Busk), off Port Phillip, 33 fath.; *id. t. c.* p. 208, pl. xiv. fig. 7.

CYCLOSTOMATA.

A. W. WATERS on the closure of the Cyclostomatous *Bryozoa*; J. L. S. xvii. pp. 400–404, with a plate.

Tubulipora perfragilis, *dawsoni*, and *fasciculifera*, spp. nn., Hincks, Ann. N. H. (5) xiii. pp. 204–206, the two latter pl. ix. figs. 5 & 6, Queen Charlotte Islands.

Fasciculipora bellis and *fruticosa*, spp. nn., MacGillivray, P. R. Soc. Vict. 1884, Apr., fig., Port Phillip Heads.

Discoporella reticulata, *pristis*, and *echinata*, spp. nn., *id. t. c.* fig., Port Phillip Heads.

CTENOSTOMATA.

Ascodictyon (Nicholson & Etheridge, 1877) and *Rhopalonaria* (Ulrich, 1879), from Silurian beds in Scotland and North America, are, probably, primitive representatives of the stoloniferous *Vesiculariidae*; G. R. Viue, Ann. N. H. (5) xiv. pp. 69–89, with woodcuts.

Flustrella hispida (Fabr.) new form *cylindrica*, and *F. dichotoma* (Suhr, as *Verrucularia*, Busk as *Farciminaria*), Port Phillip, Australia; Hincks, Ann. N. H. (5) xiii. pp. 365–367, pl. xiv. figs. 1 & 2.

Paludicella erecta, sp. n. Tentacles of the lophophore 19–21, each with a row of quiescent setæ upon the outer median line; Pennsylvania, on stones and encrusting spores; erect portions of the cœnœcial cells about a line in height. Potts, P. Ac. Philad. 1884, pp. 213 & 214 (also Ann. N. H. (5) xiv. pp. 437–439).

LOPHOPODA.

Pectinatella magnifica (Leidy) found in the Bille, a small tributary of the Elbe, near Hamburg. In autumn, large floating, more or less spherical, masses of decaying animals and statoblasts of this species and of *Cristatella* are found, whereas the statoblasts of *Plumatella* remain fixed to pieces of bark. Kraepelin, Zool. Anz. vii. pp. 319 & 320.

Cristatella lacustris, sp. n. Lophophoric arms 52–60, mostly 54; tentacular hooks of the statoblasts more numerous than in *C. ophidioides* (Hyatt); Pennsylvania; development from the statoblasts described. Potts, P. Ac. Philad. 1884, pp. 193–199, pl. iv.

ENDOPROCTA.

Pedicellinopsis, g. n. Polypides cup-shaped, supported on chitinous tubes, with a much enlarged base (consisting of an opaque white core, probably muscular, enveloped in a chitinous covering), by which they are attached to an erect tubular stem; zoarium adherent by means of tubular root-fibres. *P. fruticosa*, sp. n., Port Phillip Heads, Australia. "The whole structure recalls very forcibly one of the Tubularian Hydroids." Hincks, Ann. N. H. (5) xiii. pp. 363-365, pl. xiv. fig. 3.

Urnatella gracilis (Leidy) described by Leidy, P. Ac. Philad. 1883, 16 pp., 1 pl.; abstract, J. R. Micr. Soc. (2) iv. 2, p. 214.

PTEROBRANCHIATA.

RAY LANKESTER describes the organization of *Rhabdopleura normanni*, and states the existence of an internal cartilaginous skeleton in the stalk, the presence of a body cavity, which had been denied by G. O. Sars in *R. mirabilis*, within the abdomen, and the chitinous nature of the axial string or blastophore. The external tube, called "tubarium," does not correspond exactly to the cœnœcium or the ectocyst of the ordinary *Polyzoa*, the wall of the body being independent of it; the tubarium is divided by septa into distinct chambers, one for each polypid; at the end of the branches the buds are formed, and each bud is separated, when increasing, by a septum; the polypid is attached to the axial string by the "gymnocaulus," or contractile string of Sars; the cephalic shield serves as a locomotive organ for ascending within the tube, and also for secreting the matter of the tube; the anterior region of the body from the mouth to the vent is very pigmented, and can be termed "thorax," the posterior bag-shaped part, "abdomen;" the testis is placed within the body cavity in the abdomen at the right side of the intestine, and opens near the vent. The author retracts his former opinion that the cephalic disk is homologous to the foot of the Gastropods; it is dorsal, as the epistome of the *Phylactolamata* and of *Phoronis*, and may rather be compared to the mantle of the Bivalves. Q. J. Micr. Sci. (2) xxiv. pp. 622-647, with 6 pls.; abstract in Arch. Z. expér. (2) iii. 1885, pp. xvii.-xx.

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CRUSTACEA.

BY

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ANATOMY AND PHYSIOLOGY.

1. *Nervous System and Organs of Sense.*

H. VIALLANES describes the optic ganglion of *Palinurus vulgaris*. The more important of his observations are the following:—The large nervous cells in the layer of ganglion cells are very rare and scattered. There is a distinct lobe in front of the external medullary mass, composed of gigantic unipolar cells, which come from the fibres of the chiasma. The external medullary mass is hemispherical, much depressed from before backwards; another mass of ganglia, called "couronne ganglionnaire," is annexed to it, covering the internal side of the chiasma and composed of unipolar large and small nervous cells. A bundle of nervous fibres of the chiasma goes partly to the internal medullary mass, partly to the optic nerve. The terminal medullary mass is divided by two furrows into two spheres, upper and lower. The whole optic nerve enters the upper, and its bundle of tubes is blended with it; the fibrillar bundle, on the contrary, penetrates the upper without losing its autonomy, and finally enters the lower sphere. The terminal medullary mass is nearly covered by numerous lobules composed of unipolar nervous cells, from each of which a bundle of fibrillæ goes either to the upper or to the lower sphere. The neurilemma of the optic nerve is continued into the sheath of the ganglion, and thence by reflection into the sclerotic. *Ann. Sci.*

Nat. (6) xvii. No. 3, 74 pp., 5 pls. [Abstract in Bull. Soc. Philom. (7) vii. pp. 68-74.]

The cephalic and abdominal ganglia of *Glyptonotus sabini* described and compared with those of other *Isopoda* and of the *Amphipoda*, by M. WEBER, Bijdr. Dierk. 1884, pp. 23-31, pl. ii: figs. 17-20.

The calceoli on the feelers of *Amphipoda* histologically described by H. BLANC, in his treatise on the *Amphipoda* of Kiel; Nova Acta Ac. L.-C. Nat. cur. xlvii.

2. Muscular System.

The absolute force of the claws in *Oarcinus manas* and *Platycarcinus pagurus* has been measured by F. PLATEAU; it is, in proportion to the transverse section of the muscles, distinctly more feeble than in man and in Bivalves, but, in proportion to the size of the animal, rather strong, being equal to $1-1\frac{1}{2}$ kilogrammes. Arch. Z. exper. (2) iii. 1885, pp. 189-210, pl. x.

Arrangement of the locomotor muscles and their action in *Glyptonotus sabini*; M. WEBER, Bijdr. Dierk. 1884, pp. 9 & 10.

3. Organs of Digestion.

MOCQUARD continues and finishes his paper on the stomach of the T. c. pp. Crustacea, in Ann. Sci. Nat. (6) xvi. pp. 188-311, describing at of *Atya*, *Caridina*, *Rhychoinetes*, *Alpheus*, *Athanas*, *Hippoparker*, T. species of *Palamon*, *Orangon*, *Nika*, *Mysis*, *Squilla*, and *Gono-* Tr. N. He comes to the conclusion that in all the stalk-eyed *Crustacea* POPPE, Seton of the stomach shows the same plan of construction, and as only by changes in the form or in the relations of the single pieces, by their coalescence or disappearance; that no quite new piece is added to the normal ones in any genus; and that, even in the most degraded forms, the homology of the pieces can be nearly always pointed out. The really natural families, such as the *Grapsidæ*, *Gelasimidæ*, *Leucosidæ*, *Paguridæ*, *Palinuridæ*, *Thalassinidæ*, *Astacidæ*, *Penaidæ*, and *Atyidæ*, show also a characteristic configuration in these hard pieces of the stomach: for instance, *Pinnotheres*, *Myctiris*, and *Doto* are proved by this test to approach the *Gelasimidæ*; *Gonoplax* belongs in this respect to the *Cancridæ*, not to the *Ocypodidæ*; *Lithodes* approaches *Birgus*; *Æglea* is intimately allied neither to *Porcellana* nor to *Galatea*; *Pasiphaea* is to be removed from the *Palamonidæ* and *Rhychoinetes* from the *Penaidæ*. The *Macrura* exhibit, concerning the armature of the stomach, more distinctly circumscribed families than the *Brachyura*; the *Anomura* are proved also by this test to be a quite artificial division. The author proceeds further to describe the muscles of the stomach and their action, which he was able to observe in motion in fresh specimens of *Stenorhynchus* (p. 269); and, finally, he describes the stomatogastric nerves. Ann. Sci. Nat. (6) xvi. pp. 188-311, pls. ii.-xi. [Abstracts in Rev. Sci. (3) iv. No. 7, p. 204, and J. R. Micr. Soc. (2) iv. p. 742.]

Intestine of *Glyptonotus sabini* and its glands anatomically described; the function of the latter combines probably that of liver and pancreas. M. WEBER, Bijdr. Dierk. 1884, pp. 12-16, pls. i. figs. 7-12, & iii. fig. 23.

4. Organs of Circulation.

C. CLAUS describes the circulatory organs of the *Mysidæ* and of many genera of *Macrura*, of *Pagurus*, *Porcellana*, and several *Brachyura*. He states that in the *Mysidæ* they are not so simple as has been hitherto supposed, but very complicated, and corresponding to those of the *Decapoda* in many points; the rather long heart extends beyond the somites of the three pereopods, and the arteries for the liver are unpaired and have their origin in the lower wall of the heart. Concerning the *Decapoda*, the author dwells on the development of the circulatory organs in their relations to the development of the whole body and its paired appendages; he urges, further, that a large quantity of blood, chiefly that contained within the carapace, returns directly to the heart, without passing through the gills, and that, although the continuity of the arteries may be traced unto the smallest capillaries, yet between these and the veins lacunar spaces exist; the circulatory system is therefore not closed. Arb. z. Inst. Wien, v. pp. 271-318, with 9 pls. [In Zool. Rec. xx. Crust. pp. 2 & 6, for "Arb. z. Inst. Würzb." read "Arb. z. Inst. Wien."]

5. Secretion.

The antennary gland in the *Cytheridæ* serves probably for the secretion of a glutinous thread, by which it fixes itself to foreign bodies; observations on *Elpidium bromeliarum*: W. MÜLLER, Arch. f. Nat. 1. pp. 213-216.

6. Organs of Generation.

M. WEBER describes the male and female sexual organs of *Glyptotus sabini*, and their periodical changes. The orifices of the oviduct are closed during one period, and are again opened at the next moult; the lamellæ of the breeding pouch are of very different size and development at different periods. The same is the case with the male copulatory organs and the size of the antennæ in the male. In all blind *Iso-poda*, the olfactory organs in the antennæ are remarkably well developed in the males. Bijdr. Dierk. 1884, pp. 16-23 & 33, pls. i. fig. 11, ii. figs. 13-16, & iii. figs. 21 & 22.

The genital organs of the *Cypridæ* and *Cytheridæ*, male and female, are compared, and their homologies made out; a hitherto unknown canal, belonging probably to a gland, in *Cytheridea torra*, stronger developed in earlier age, rather rudimentary in *Cytherura gibba* and *Elpidium bromeliarum*, described; the secondary sexual character of the paired appendage between the first pair of ambulatory feet in the *Cytheridæ* stated, it being only found in the males. W. MÜLLER, Arch. f. Nat. 1. pp. 1-12, pl. i. [abstract in J. R. Micr. Soc. (2) iv. p. 377].

Some experiments concerning the amoeboid movements of the spermatozooids of *Polyphemus pediculus*, which produce a very long pseudopo-

dium at either end, under the influence of a solution of sugar, by O. ZACHARIAS, Z. wiss. Zool. xli. pp. 252-258, pl. xvi.

Concerning secondary sexual differences [vide *infra*, *Callinectes*, colour of claws, and *Gammarus*, changes by moulting].

7. Development.

H. W. CONN examines the first stages of metamorphosis in several Decapods, especially the larval skin which surrounds the young animal when just hatched, and its differences from the Zoea stage. He compares further the number and shape of the maxillipeds, antennæ, and tail-spines in the corresponding stages of different genera, as *Panopæus*, *Callinectes*, *Sesarma*, *Pinnotheres*, and *Penæus*, and he comes to the conclusion that all Decapods can be referred back to a form similar to the Proto-zoea, in which the segments of the thorax, and probably of the abdomen, were present, and whose antennæ were locomotor organs; but that in the larval history of most living Decapods the Proto-zoea has become modified by the free life of the embryo, and the result has been the appearance of a Zoea stage, which is widely different in different groups of *Crustacea*, and which must be considered as a secondary larval modification, not as an ancestral form, and is therefore not of very high systematic importance. Stud. Biol. Lab. J. Hopkins Univ. iii. No. 1, pp. 1-27, pls. i. & ii. [abstracts in Ann. N. H. (5) xiii. p. 152, and J. R. Micr. Soc. (2) iv. p. 226.]

G. O. SÄRS describes the Zoea stages of several *Macrura* of the northern seas, e.g., that of *Calocaris macandrewæ*, *Gebia*, and *Nephrops norvegicus* [title, vide *suprà*]. Some notes concerning them, by C. Claus, Arb. z. Inst. Wien, v. pp. 317 & 318, deal chiefly with the identification of several larvæ described by the latter.

C. CLAUS feels, by his researches into the circulatory organs of the *Decapoda*, confirmed in the supposition that both the *Stomapoda* and *Schizopoda* must be regarded as ancestral forms of the *Decapoda*, but that the Zoea stage does not represent an ancestral form, which had lived once as a full-grown animal, and he adduces, in favour of this view, the presence of the thoracic ganglion-mass and the sternal artery in the Zoea stage, before the segments of the thorax and its feet make their appearance; Arb. z. Inst. Wien, v. pp. 297 & 298.

Y. DELAGE describes the development of *Sacculina carcini* (Thomps.), which begins with a Nauplius similar to that of the *Cirripedia*, but devoid of a digestive tube. The second stage resembles the *Cyprida*, with six pairs of natatory appendages and a pair of sensory and prehensile antennæ by which it fixes itself on the host; the abdomen is rudimentary, and the ovary in a bifurcated appendage. The third stage, "Kentro-*British Coast*," is quite peculiar; it is derived only from the cephalic segment of the *British Coast* stage, and consists of a chitinous bag-shaped envelope of *Crustacea* from *Limfjord, Jutland*, which is changed into a hollow, arrow-like point, by which its contents—the ovary and an ectodermal membrane—are inoculated into the host. The next stage is an endo-parasite, among them

sitic larva which forms its organs at the expense of the cellular parts of the host, and nourishes itself by emitting root-like prolongations. The first set of eggs is fecundated by peculiar males, which resemble the *Cypris*-like stage of the hermaphrodite individual. On account of this development the author proposes a new Order for *Sacculina* and *Peltogaster*, distinct from the *Cirripedia*, and to be named *Kentrogonides*. Arch. Z. exper. (2) ii. pp. 417-736, pls. xxii.-xxx. (Abstract in Kosmos, xiv. pp. 454-457.)

Biological Observations.

G. BROOK has noted the number and dates of moulting and the corresponding size in several specimens of young *Carcinus maenas* in the *Megalopa*-stage, kept in confinement; these are rather unequal, and do not enable us to judge either the age of any particular specimen, or the number of moultings from its size and form alone: Ann. N. H. (5) xiv. pp. 202-207.

H. DEWITZ confirms the statement made by Frédéricq [Zool. Rec. xix. Crust. p. 8] that the common crayfish, if strongly irritated, casts away the claw (hand); boiling water, the flame of a spirit-lamp, or cutting off a part of the claw by scissors, can provoke this reflex action. The spot in which this self-amputation is done is always the same, between the coxa and the basipodite. Biol. Centralbl. 1884, pp. 201 & 202.

Several new *Gregarinidae* found in *Portunus*, *Carcinus*, *Pachygrapsus*, *Dromia*, *Nicæa*, *Phronima*, and *Caprella*; J. FRENZEL, Arch. mikr. Anat. xxiv. pp. 545-579, pl. i. figs. 1-69.

Entomostraca destroyed by the bladderwort, *Utricularia*; S. A. Forbes, Bull. U. S. Fish. Comm. iv. p. 443.

GEOGRAPHICAL DISTRIBUTION.

1. Land and Fresh-water Crustacea.

C. CHILTON treats of the distribution of the Terrestrial Crustacea; N. Z. J. Sci. ii. pp. 154-157.

Oniscidae in Spain; Weyers, C.R. ent. Belg. (3) No. 48, p. cclxi. 2 European species, *Porcellio scaber* (Latr.) and *pruinus* (Brandt), found on the Island of Ascension, a new *Armadillo* (Latr.) on the Tonga Islands; Studer, Isop. Gazelle, p. 5. 5 species in Australia; Haswell, P. Linn. Soc. N. S. W. ix. p. 1001.

An abstract of the researches on the pelagic fauna of the lakes in Switzerland, by Leydig, 1860; P. E. Müller, 1868; A. Forel, 1874-82; and Pavesi, 1877-79, with special regard to the Copepods and *Cladocera*, by O. E. IMHOFF, Z. wiss. Zool. xl. pp. 154-162. Own observations on the paired Lakes of Zurich, Lugano, Como, and the Lago Maggiore, by Cytheridae. Zool. Anz. vii. pp. 323-325. A. f. Nat.

Lakes at Retyezol, in Hungary. Crustacea, including 3 n
* Term. füzetek, vii. pp. 41-72, in Magyar, with abstract the sperma-
pp. 136-138. ag pseudopo-

Thelphusa fluviatilis and *Dromia vulgaris* [?, perhaps *Ocypode*.—REC.] observed in Cyprus; J. DELY, C.R. ent. Belg. (3) No. 48, p. cclx.

Island St. Thomé. Greeff recapitulates his notes on its terrestrial and fresh-water Decapods, some of which are identical with American species [see Zool. Rec. xix. Crust. p. 10], in SB. Ges. Marb. No. 2, pp. 53 & 54.

United States. C. L. HERRICK gives a full account of the known fresh-water *Cladocera* and *Copepoda*, a considerable number of which are identical with, or only distinct as varieties of European species, in his final report [vide *infra*].

2. Deep Sea Crustaceans.

S. J. SMITH gives a preliminary note on the *Crustacea* dredged during the 'Albatross' Expedition in 1883, on the East coast of North America, from off Cape Hatteras to the region of George's Banks. He urges the large size of the deep sea species, the presence of well-developed eyes in 16 species reaching to 2000–2949 fath., and the relatively large size of their eggs. Some species range through great differences of depth, e.g., *Acanthephyra agassizi* from 105–2949 fath. Am. J. Sci. (3) xxviii. pp. 52–56, and Annual Rep. Comm. Fish. for 1882, published 1884, p. 345.

Preliminary reports on the results of the French Expedition of the 'Talisman' to the Azores, Canaries, and Cape Verde Islands, by A. Milne-Edwards, C.R. xevii. p. 389 *et seq.*; also in Bull. hebdom. Ass. sci. Fr. 16 & 23 Dec. 1883 (separately, 1884, pp. 11, 12, 22, & 27), and in Ann. N. H. (5) xiii. pp. 224–226. Abstracts in Nature, xxix. No. 753, pp. 531–533, and Am. Nat. xviii. p. 1158.

Isopoda of the German Expedition of the 'Gazelle,' by T. STUDER, Abh. Ak. Berl. 1883 [1884], 28 pp., 2 pls.

54 species of *Schizopoda* from the collections of H.M.S. 'Challenger,' many new, preliminary enumeration and description by G. O. SARS, in For. Selsk. Chr. 1883, No. 7, 43 spp., some from the surface, others abyssal, 3 species of *Euphausia* from the Antarctic Ocean, near the ice barrier, at the surface.

3. European Seas.

Polar Sea. 15 species of *Isopoda* collected by the Dutch Expedition of the 'Willem Barents,' in 1880–81, enumerated, partly described, and figured by M. WEBER, Bijdr. Dierk. 1884, pp. 3–38, pls. i.–iii.

Færoe Channel. A. M. NORMAN has enumerated the *Crustacea* dredged during the expedition of the 'Knight Errant' in 1880, among which are a new *Nephropsis* and 2 new Amphipods; P. R. Soc. Edinb. xi. 1881–82, pp. 683–689.

British Coasts. *Planes linnæus* and *Portunus pusillus* observed at Penzance; T. CORNISH, Zool. (3) viii. pp. 75 & 116. Note on the *Crustacea* from the South coast of Devon; t. c. pp. 151–153. Occurrence of *Pasiphaa sivado* (Risso); C. F. Fish, Naturalist (2) x. Nov., p. 93.

Limfjord, Jutland. 40 species of marine *Crustacea*, without *Entomostraca*, among them *Homarus vulgaris*, *Cancer pagurus*, *Pandalus annuli-*

cornis, 4 species of *Mysis*, 2 *Caprellidæ*; J. COLLIN, Limfjordens marine Fauna, pp. 21 & 22.

Baltic. 1 species of Cirripeds, 3 Copepods, 2 *Ostracoda*, 2 *Cladocera*, 11 Amphipods, 5 Isopods, 1 *Cuma*, 4 *Mysis*, and *Crangon vulgaris*, among which five (*Gammarus pulex*, *Asellus aquaticus*, *Cypris pusilla*, *ornata*, and *Argulus foliaceus*) elsewhere inhabitants of fresh-water, found in the Finnish inlet between Dagö Island and Paponwick; M. BRAUN, Arch. Nat. Liv. (2) x. pp. 98-102, 114, & 112. *Idotea entomon* and *Cuma*, as deep as 60 fath., *Mysis* and *Crangon* to 20; *id. t. c.* p. 118.

Baltic. 17 species of *Amphipoda* observed at Kiel, and described by H. BLANC, Nova Acta Ac. L.-C. Nat. cur. xlvii. pp. 39-96, 5 pls.

List of *Cytheridæ* found in the German and Baltic Seas, by W. MÜLLER, Arch. f. Nat. l. pp. 12-17.

Ooster-Schelde, Neïtherlands. 2 species of *Balanus*, 1 *Sacculina*, 15 *Amphipoda*, 4 *Isopoda*, 4 *Mysidæ*, 3 *Macrura*, among which the lobster, 2 *Anomura*, and 3 *Brachyura*, by P. P. C. HOEK, Tijdschr. Nederl. Dierk. Ver. Suppl. I, pt. 2, in the Dutch and French languages. *Porcellana platycheles* (Penn.) and *Portunus puber* (Leach) observed on the Dutch coast, by C. KERBERT, Tijdschr. Nederl. Dierk. Ver. 1884, pp. 2 & 3.

Brest. 2 new species of *Porcellana* and 1 of *Anceus*; HESSE, Ann. Sci. Nat. (6) xvii. Arts. 5 & 6, pls. xvii. & xviii. Several new parasitic *Copepoda*; *id. op. cit.* xvi. Art. 3, 3 pls. [Abstracts in J. R. Micr. Soc. (2) iv. pp. 562 & 744.]

Sicily. G. SEGUENZA's paper on the *Ostracoda* of Messina [Zool. Rec. xx. Crust. p. 25] begins in Nat. Sicil. ii. 1883, p. 284, and is continued *op. cit.* iv. 1884, pp. 44-48.

Adriatic. 23 species of marine free *Copepoda* found at Trieste, 3 new, enumerated by L. CAR, Arch. f. Nat. l. pp. 237-254, pls. xvii. & xviii.

4. Exotic Seas.

Behring's Sea. 21 species of Decapods collected by AUR. & ARTH. KRAUSE, determined by F. RICHTERS, Abh. senck. Ges. 1884, pp. 401-407, 1 pl. 4 species of *Copepoda* collected by the same, described by POPPE, Arch. f. Nat. l. pp. 281-304, pls. xx.-xxiv.

East Coast of North America. New or little-known *Galateidæ* and *Carides*; S. SMITH, P. U. S. Nat. Mus. vii. pp. 493-511.

R. RATHBUN enumerates 22 N. American species of *Caligidæ*, *Dichelestiidæ*, *Chondracanthidæ*, and *Lernæidæ*, among which several common with Europe—e.g., *Caligus curtus* (Müll.), *Lepeophtheirus salmonis* (Kröy.), *Pandarus cranchii* (Kröy.), *Cecrops latreillii* (Leach), *Dichelesthium sturionis* (Herm.), *Anchorella uncinata* (Müll.), and *Lernæa branchialis* (L.); P. U. S. Nat. Mus. vii. pp. 486-492.

Mauritius. 23 species of Decapods and Stomatopods collected by V. DE ROBILLARD, among which 1 new and 5 not known before from that island; MIERS, P. Z. S. 1884, pp. 10-17, pl. i.

Seychelles, Amirantes, and Providence Group. 74 species of *Brachyura*, 15 *Anomura*, 8 *Macrura*, 3 *Stomatopoda*, and 1 Amphipod collected by R. W. COPPINGER, enumerated, with mention of other localities, critical

remarks, and a comparative table of the range of those species on the E. African Coast, including the Red Sea, and those islands, by E. J. MIERS, Zool. Coll. Alert, pp. 513-575, pls. xlvii.-lii.

Northern Australia. 121 species of *Brachyura*, 25 *Anomura*, 21 *Macrura*, 3 *Stomatopoda*, 16 *Isopoda*, 12 *Amphipoda*, 1 only of *Ostracoda*, and 3 *Cirripedia*, in all 202 species of *Crustacea*, collected off the N.E. Coast of Australia, in Torres Straits, and the Arafura Sea, by R. W. COPPINGER during the voyage of H.M.S. 'Alert,' are enumerated, and most of them critically discussed; *id. t. c.* pp. 178-322, pls. xviii.-xxxiv.

Australia. 5 species of *Idotea*, 5 *Cymothoidæ*, 7 *Ægidæ*, 32 *Spheromidæ*, 2 *Arcturidæ*, 7 *Anthuridæ*, 4 *Tanaidæ*, 1 *Anceus*, and 2 *Asellidæ*, enumerated by W. A. HASWELL, P. Linn. Soc. N. S. W. ix. pp. 1001-1014, pls. i.-liii. 10 species of *Læmodipoda*, 2 new, by the same; *t. c.* pp. 993-1000, pls. xlviii. & xlix. Several *Amphipoda*; *id. t. c.* pp. 1035-1042, p. ls. xlv. & xlvii.

New Zealand. 5 species of *Amphipoda*; *id. t. c.* pp. 1043 & 1044.

Antarctic Regions. *Serolis* [vide *infra*, in the special part].

25 species of marine *Isopoda*, chiefly from Magellan Straits, Patagonia, Kerguelen, and Australia, collected during the Expedition of the 'Gazelle,' several new, described by T. STUDEB, Isop. Gazell., Abh. Ak. Berl. 1883 [1884], 26 pp., 2 pls.

DECAPODA.

Conclusions bearing on the systematic affinity and differences of several families and genera, drawn from the examination of the hard parts of the stomach, by MOCQUARD [vide *suprà*, p. 5].

BRACHYURA.

INACHIDÆ.

Achaus lavioculis, sp. n., Miers, Zool. Coll. Alert, p. 520, pl. xlv. fig. a, Seychelles; *A. affinis*, sp. n., *id. t. c.* p. 188, Torres Straits.

Oncinopus aranea (Haan) = *neptunus* (Ad. & Wh.) = *subpellucidus* (Stimps.) = *angulatus* (Hasw.), E. Coast of Australia; *id. t. c.* p. 190.

Anamathia, new name for *Amathia* (Roux, preoccupied by Lamouroux in *Bryozoa*); list of known species; *A. agassizii* (S. Smith) probably = *crassa* (A. Milne-Edw.). S. Smith, P. U. S. Nat. Mus. vii. p. 493.

Stilbognathus martensii, sp. n., Miers, *t. c.* p. 521, pl. xlv. fig. b, Amirantes and Providence Group.

MAIIDÆ.

Egeria arachnoides (Rumph.), including *herbstii* and *indica* (Milne-Edw.), but not *Cancer longipes* (L.); *id. t. c.* pp. 191 & 192.

Hyas coarctatus (Leach) from Behring's Sea; younger specimens

covered with sponges and polyparies, older ones with *Balanidae*: Richters, Abh. senck. Ges. 1884, p. 402.

Paramithrax (*Chlorinoides* [Chor-]) *coppingeri* (Hasw.) and *aculeatus* (Milne-Edw.) var. n. *armatus*, Port Curtis and Torres Island; Miers, t. c. pp. 192 & 193, pl. xviii. fig. a. *P. (C.) longispinus* (Haan) var. n. *bituberculata*; id. t. c. p. 522, Amirantes.

Hyastenus convexus, sp. n., Port Molle, E. Australia, p. 196, and notes on other species, pp. 194 & 195; id. t. c. pl. xviii. fig. b.

Eurynome stimpsonii, sp. n., id. t. c. p. 523, pl. xlvii. fig. a, Providence Reef, Mascarenes.

Micippa thalia (Hbst.) var. *haani* (Stimps.), Providence Island, id. t. c. p. 524.

Paramicippa asperimanus, sp. n., Providence Island and Seychelles, id. t. c. p. 525.

PERICERIDÆ.

Libinia emarginata (Leach). Anatomical description by E. A. Andrews, Tr. Conn. Ac. vi. pp. 99-121, 3 pls.

Entomonyx, g. n. Near *Pericera*, from which it is distinguished by the two narrow fissures in the upper margin of the deep, well-defined orbits, by the deflexed rostrum, and by the absence of a series of lateral spines. *E. spinosus*, sp. n., Providence Reef and Island; Miers, t. c. pp. 525 & 526, pl. xlvii. fig. b.

ssina [Zool. Rec.
is continued

PARTHENOPIDÆ.

Lambrus turriger (White), Arafura Sea, description, *hoplonotus* var. n. *granulosus*, N.E. Australia, and *L. (Parthenopoides) harpax* (Ad. & Wh.) = ? *sandrockii* (Hasw.), Torres Straits; id. t. c. pp. 201 & 202.

CANCERIDÆ.

Banareia inconspicua, sp. n., id. t. c. p. 210, pl. xix. fig. c, Port Darwin.

Euxanthus tuberculosus, sp. n., id. t. c. p. 205, pl. xix. fig. a, Torres Straits; *E. exsculptus* var. n. *rugosus*, id. t. c. p. 527, Amirantes.

Hypocelus punctatus, sp. n., id. t. c. p. 206, pl. xix. fig. b, Torres Straits.

Xantho macgillivrayi, sp. n., id. t. c. p. 211, pl. xx. fig. c, Port Molle and Port Curtis, E. Australia.

Halimede ? *coppingeri*, sp. n., id. t. c. p. 208, pl. xx. fig. b, Arafura Sea.

Etisodes electra (Herbst) = *frontalis* (Dana) = *rugosus* (Lucas) = *sculptilis* (Heller), N.E. Australia; id. t. c. p. 218.

Chlorodius rufescens (Targ.-Tozz.) = *niger* (Forsk.); Miers, P. Z. S. 1884, p. 11.

Chlorodopsis granulatus (? Stimps., *Pilodius*), id. Zool. Coll. Alert, p. 216, pl. xxi. fig. a, Port Denison and Port Molle.

Cymo andreossii (Aud.) var. *quadrilobatus* [-a], id. t. c. p. 533, Red Sea.

ERIPHIIDÆ.

Galene granulata, sp. n., *id. t. c.* p. 208, pl. xx. fig. a, Port Darwin.

Pilumnus pulcher, sp. n., Torres Straits, *lanatus* (? Latr.), Port Jackson, *semilanatus*, sp. n., Torres Straits, *seminudus*, sp. n., Port Denison, *cursor* (? A. M.-Edw.), Port Denison, and *labyrinthicus*, sp. n., Port Molle; *id. t. c.* pp. 219-224, pls. xxi. figs. b & c, & xxii. figs. a-c.

Actumnus setifer (Haan) = *tomentosus* (Dana), variations; *id. t. c.* pp. 225 & 226.

Cryptocaloma, g. n. Carapace transverse, nearly flat above, antero-lateral margins much shorter than the postero-lateral, and forming with the apparent frontal margin an unbroken curve, which is bordered with a thick fringe of very close-set cinereous hairs. Palatal ridges nearly obsolete. Orbits transverse, with the margins subentire, not visible from above, but concealed beneath the projecting anterior margin of the carapace. *C. fimbriatum* (M.-Edw., *Pilumnus*), Torres Straits; only female known; belongs perhaps to the *Grapsoidæ*. *Id. t. c.* p. 227, pl. xxiii. fig. a.

Eurpeppelia, new name for *Rueppellia* (M.-Edw.), which is preoccupied in *Diptera*; *id. t. c.* pp. 533 & 534.

Tetrastichus avinanus (Heller), Seychelles, variation; *id. t. c.* p. 537.

PORTUNIDÆ.

Conclusus hastata. In the males the blue colour prevails in the chelæ, in the female the orange; Conn, Ann. N. H. (5) xiii. p. 71 [abstract in *Micr. Soc.* (2) iv. p. 560].

Achelous granulatus (M.-Edw.) var. from Torres Straits; Miers, *t. c.* p. 230, pl. xxiii. fig. b.

Xiphonectes vigilans (Dana) var. n. *obtusidentatus*, Seychelles; *id. t. c.* p. 538, pl. xlviii. fig. a.

Thalamita quadrilobata, sp. n., *id. t. c.* p. 539, pl. xlviii. fig. b, Seychelles.

Goniosoma variegatum (Fabr.) = *callianassa* (Herbst), description; and *spiniferum*, sp. n., Port Molle: *id. t. c.* p. 233, the latter, pl. xxiii. fig. c.

TELPHUSIDÆ.

Telphusa fluviatilis (Latr.), Cyprus; Deby, C.R. ent. Belg. (3) No. 42, p. cclx. *T. crassa* (? A. M.-Edw.), Torres Straits; Miers, *t. c.* p. 235.

GONOPLACIDÆ.

Macrophthalmus punctulatus, sp. n., *id. t. c.* p. 237, pl. xxv. fig. a, Port Jackson.

Euplax (Chanosstoma) boscii (Aud.): addition to the description; *id. t. c.* pp. 238 & 542.

Pseudorhombila vestita (Haan) var. *sexdentata* (? Haswell, *Eucrate*),

Arafura Sea, and *sulcatifrons* (Stimps.) var. n. *australiensis*, Port Molle; Miers, t. c. pp. 240-242, pl. xxiv. figs. b & c.

Carcinoplax integra, sp. n., id. t. c. p. 543, pl. xlviii. fig. c, Seychelles.

Camptoplax, g. n. Near *Pilumnoplax* and *Heteroplax*; distinguished from both by the absence of palatal ridges, by the basal antennal joint being short, not reaching the subfrontal process, and by the position of the male verges directly on the base of the fifth ambulatory legs, not in sternal channels. *C. coppingeri*, sp. n., Torres Straits. Id. t. c. p. 239, pl. xxiv. fig. a.

Ceratoplax arcuata, Port Darwin, and ? *lævis*, Arafura Sea, spp. nn., id. t. c. pp. 243-245, pl. xxv. figs. b & c.

GRAPSIDÆ.

Metopograpsus messor (Forsk.) var. *intermedius* (M.-Edw.), Australia; id. t. c. p. 245.

PINNOTERIDÆ.

Xenophthalmodes mæbii (Richters) referred to the *Rhizopidæ*; id. P. Z. S. 1884, p. 12.

LEUCOSIDÆ.

Leucosia craniolaris var. n. *lavimana*, Torres Strait; series of Ids., Mascarenes; Alert, p. 250, pl. xxvi. fig. a.

Philyra rectangularis, sp. n., id. t. c. p. 546, pl. xlix. fig.

Pseudophilyra polita, sp. n., id. t. c. p. 547, pl. xlix. fig. b.

Ebalia granulata (Rüpp.): description; id. t. c. p. 549.

Oreophorus frontalis, sp. n., id. t. c. p. 254, pl. xxvi. fig. b, Port Molle.

Arcania undecimspinosa (Haan), including *granulosa* (Miers): variation; id. t. c. p. 548.

CALAPPIDÆ.

Calappa gallus (Hbst.) var. n. *bicornis*, Providence Island, Mascarenes; id. t. c. p. 550.

Matuta inermis, sp. n., id. t. c. p. 256, pl. xxvi. fig. c, Torres Straits.

CORYSTIDÆ.

Platycorystes isenbeckii (Brandt), from St. Paul's Island, Behring's Sea; Richters, Abh. senck. Ges. 1884, p. 402, pl., figs. 1-3. Young specimens of the same (?) in the *Megalopa*-stage; t. c. p. 403, figs. 4-8.

Paratymolus (Miers), its affinity with *Telmessus* and *Homola*; *P. bituberculatus* (Hasw.) var. n. *gracilis*, and *P. sexspinosus*, sp. n., both Torres Straits: Miers, Zool. Coll. Alert, p. 261, the latter, pl. xxvii. fig. b.

DORIPPIDÆ.

Dorippe dorsipes (L., Cancer) = *quadridens* (Fabr.), N.E. Australia and Arafura Sea, and *australiensis*, sp. n., Port Denison and Moreton Bay; id. t. c. pp. 257-259, the latter, pl. xxvi. fig. d.

Ethusina, g. n., S. Smith, Ann. Rep. Comm. Fish. for 1882 [1884], p. 345, N. Atlantic.

Cymopoda whitei, sp. n., Miers, t. c. p. 551, pl. xlix. fig. c, Seychelles.

ANOMURA.

DROMIDÆ.

Dromia vulgaris (M.-E.). J. Deby thinks he has found it on the island of Cyprus, 3-4 kilometres from the sea, "courant avec rapidité d'une pierre à l'autre"; C.R. ent. Belg. (3) No. 42, p. cclx. [This cannot be a *Dromia*; perhaps *Ocypode* is meant.—REC.]

Dromidia spongiosa (Stimps.) var. n. *stimpsonii*, Mozambique; Miers, Zool. Coll. Alert, p. 552, pl. l. fig. a.

Petalomera pulchra, sp. n., *id.* t. c. p. 260, pl. xxvii. fig. a, Torres Straits.

Homalodromia, g. n. Allied to *Pseudodromia* (Stimps.), but distinguished by the flattened carapace, by the broad front consisting of two prominent lobes which project over and beyond the bases of the antennæ, and are each excavated at the distal extremity, and by the much shorter fifth ambulatory leg. *H. coppingeri*, sp. n., Providence, 24 fath. *Id.* t. c. pp. 553 & 554, pl. l. fig. b.

Callinectæ

LITHODIDÆ.

in the f. *des camtschaticus* (Titesius): young specimen; Richters, Abh. Senck. Ges. 1884, p. 404; frontal region, figs. 9 & 10.

PAGURIDÆ.

Eupagurus compressipes, sp. n., Port Denison, and *kirkii*, sp. n., Arafura Sea, Miers, t. c. pp. 266 & 267, pl. xxviii. figs. b & c.

Eupagurus. 5 new species from New Zealand; Filhol, Bull. Soc. Philom. (7) viii. pp. 66-68.

Pagurus guttatus (Oliv.)? var. from the Seychelles; Miers, t. c. p. 555.

P. hessii, sp. n., *id.* t. c. p. 264, pl. xxviii. fig. a, Arafura Sea.

Diogenes rectimanus, sp. n., *id.* t. c. p. 262, pl. xxvii. fig. c, Torres Straits.

Ptychogaster, g. n. Abdomen twice coiled upon itself. *P. formosus*, sp. n., depths of 4000 metres. A. Milne-Edwards' Crustacea of the Talisman [vide *suprà*, p. 9].

Canoëtia rubescens, sp. n., Greeff, SB. Ges. Marb. No. 2, p. 53, Island S. Thomé, W. Africa.

PORCELLANIDÆ.

Petrolisthes lamarekii var. *asiaticus* (Leach), Amirantes, Philippines, Viti Islands, *P. annulipes* (White, ined.), Seychelles, *maculatus* (Milne-

Edw.), Mozambique, description, *villosus* (? Richters), Amirantes; Miers, *t. c.* pp. 557-559.

Petrolisthes haswelli, sp. n., Torres Straits, *annulipes* (White), Port Denison and Port Molle, and *corallicola* (? Haswell), Port Molle, with notes on other species; *id. t. c.* pp. 268-272, pl. xxix. figs. a-c.

Porcellana platycheles (Penn.): colour in life pale yellowish, with gray hairs; Kerbert, Tijdschr. Nederl. Dierk. Ver. 1884, p. 2. *P. navigatrix*, sp. n., Brest, on the keel of a stationary vessel covered with weed and *Synascidia*, and *stenocheles*, sp. n., only female known, Brest, on a weed, *Cystoseira fibrosa*, cast on shore, and description of the larva of *P. platycheles* (Penn.) found in the stomach of the mackerel; Hesse, Ann. Sci. Nat. (6) xvii. Art. 5, 14 pp. pl. xvii. [abstract, J. R. Micr. Soc. (2) iv. p. 744]. *P. nitida* (Hasw.) var. n. *rotundifrons*, Port Denison, *dispar* (Stimps.), Port Jackson, and *quadrilobata*, sp. n., Torres Straits; Miers, *t. c.* pp. 274-277, pl. xxx. figs. b-d.

Polyonyx obesulus (White), Port Denison; *id. t. c.* p. 272, pl. xxix. fig. d. *P. biunguiculatus* (Dana): specimens from the Seychelles and Amirantes; Miers, *t. c.* p. 559.

Platycheles pulchellus (Hasw.), Port Molle and Torres Straits; *id. t. c.* p. 273, pl. xxx. fig. a.

MACRURA.

GALATEIDÆ.

Gulathea spinosirostris (? Dana), Amirantes and Providence; Miers, *t. c.* p. 560. *G. australiensis* (Stimps.), Port Denison, and (White), Albany Island; *id. t. c.* pp. 277 & 278, the former, pl. xxxi. fig. b.

Galathodes antonii, sp. n., Alphonse Milne-Edwards' Crustacea of the Talisman [vide *suprà*, p. 9], depth of 4000 metres.

Munida edwardsii, sp. n., Miers, *t. c.* p. 560, pl. li. fig. a, Amirantes; *M. spinulifera*, sp. n., *id. t. c.* p. 279, pl. xxxi. fig. b, Arafura Sea.

Munidopsis (Whiteaves) = *Galacantha* (A. Milne-Edw.); *crassa* and *similis*, spp. nn., E. Coast of N. America, 36° and 39° N. lat., 2574 and 1060 fath.: S. Smith, P. U. S. Nat. Mus. vii. pp. 493-496 [1885].

PALINURIDÆ.

The structure of the head in *Palinurus*, with especial reference to the classification of the genus, is treated by T. Jeffery Parker, Tr. N. Z. Inst. xvi. pp. 297-307, pl. i. Optic ganglion of *P. vulgaris*, by Viallanes [vide *suprà*, p. 4].

Palinurellus (Martens). Some notes concerning it; Pfeffer, Verh. Ver. Hamb. v. 1882, p. 103.

ERYONIDÆ.

Archæastacus, g. n., from the Lias at Lyme Regis. Resembling as much the recent *Polychæles* as nearly as it does the ancient *Eryon*. S. Bate, Geol. Mag. (3) i. July, 1884, pp. 7-9, pl. x.

ASTACIDÆ.

A fourth edition of Prof. HUXLEY's "Crayfish" has been published, 386 pp., 82 illustrations.

Abnormal colour of common lobster; Zoologist (3) viii. p. 491.

Hundred lobsters from the Fort Pond Bay, Long Island, transferred to Chesapeake Bay; Oct., 1883; W. M. Wood, Bull. U. S. Fish. Comm. iv. p. 16. R. RATHBUN gives notes on the decrease of lobsters in N. America; Bull. U. S. Fish. Comm. iv. pp. 421-426.

O. MICHA gives a note concerning the growth of the crayfish, comparing his own observations with those made by Carbonnier, Souberain, and others; according to Micha, the newly-hatched, in July, measures 9 mm., at the end of the same year 20, in the second year 30, in the third 40, in the fourth 60, in the fifth 80, in the seventh 100, in the tenth 125, in the thirtieth 170-200. Circ. deutsch. Fisch. Ver. 1884, pp. 19-21.

HARZ and R. LEUCKART came nearly at the same time, by examination of diseased crayfishes, to the conclusion that endoparasitic fungi are the true cause of the disease, and that the ovoid corpuscles accused by V. Linstow are normal histological elements in the crayfish. Z. Ver. Baiern, Feb. 1884 and Circ. deutsch. Fisch. Ver. 1884, No. 3, April, pp. 62-65.

R recapitulates his researches on diseased crayfish in Rec. xx. Crust. p. 10] and 1884. He states that the amoebæ, regarded by some as the cause, are normal histological

Callinectes and he found also mycelia of the genus *Aphanomyces* in the other parts of diseased crayfishes; further, he mentions another parasite, *Echinorhynchus polymorphus*, and calls attention to the disease ravaging the crayfishes of Upper Italy in 1863, which was attributed to the presence of an external parasite, *Vaginicola*. Circ. deutsch. Fisch. Ver. 1884, pp. 123-125.

The papers on the diseases of crayfish in Germany by M. v. D. BORNE & LINSTOW [Zool. Rec. xx. Crust. p. 10] are translated into French in Bull. Soc. Acclim. 1884, p. 209, and into English in Bull. U. S. Fish. Comm. iv. pp. 299-302; neither mention that the ovoid corpuscles described by V. Linstow have since proved to be normal bloodcells of the crayfish.

Hints for stocking ponds with crayfish, by Friedel & O. Micha, Circ. deutsch. Fisch. Ver. p. 3.

Crayfish from Turkestan, its resemblance and difference from other Russian species, which are divided into 3 groups—(1) of the rivers tributary to the Baltic, (2) of the rivers tributary to the Black and Caspian Seas, and (3) of the Aral Sea; the differences between all these groups are not quite constant. Schimkewitsch, Zool. Anz. vii. pp. 339-341.

The known species of *Cambarus*, 55, and *Astacus*, 14, with their synonymy and geographical range, enumerated by W. Faxon, P. Am. Ac. xx. pp. 135-158.

Cambarus. W. FAXON has observed in *Cambarus rusticus* and *propinquus* that males of the first form assumed by moulting the second form, and he concludes thence that these two forms are due not to dimorphism,

as was presumed hitherto, but are alternating in the same individual; Am. J. Sci. (3) xxvii. pp. 42-44, the same in Ann. N. H. (5) xiii. pp. 147 & 148 (abstracts in Am. Nat. xviii. p. 731, and in Kosmos, xiv. p. 467).

Cambarus diogenes. Observations on its burrowing and building by R. S. Tarr, Nature, xxx. No. 726, pp. 127 & 128, and C. C. Abbott, Am. Nat. xviii. p. 1157, the former regarding the so-called "chimney" as the accidental result of digging, the latter thinking that it is built intentionally and carefully by the crayfish.

Cambarus hayi, Macon, Mississippi, *pubescens*, Georgia, *alleni*, Florida, *simulans*, Texas and Kansas, *acuminatus*, S. Carolina, *dubius*, W. Virginia and Tennessee, *argillicola*, Canada, Indiana, Kansas, and Louisiana, *uhleri*, Maryland, *girardianus*, Alabama, *jordani*, Georgia, *cornutus*, Kentucky, *medius*, Montana, *mississippiensis*, Macon, Mississippi, *palmeri*, Tennessee, *alabamensis* and *compressus*, Alabama, *sanbornii*, Kentucky and Ohio, *harrisoni*, Montana, *putnami*, Kentucky, *forceps*, Alabama, and *shufeldtii*, New Orleans, all new species; Faxon, P. Am. Ac. xx. pp. 107-135 (figures are promised to be given hereafter).

Cambarus. Notes on parasitic *Trematoda* in American crayfish, by Kellicott, P. Am. Micr. Soc. 1883, p. 115, and Ramsay Wright, Am. Nat. xviii. 1884, p. 429, with woodcut.

Nephrops norvegicus (L.): zoea stage; G. O. Sars [title, vide *supra*] and Claus, Arb. z. Inst. Wien, v. p. 318. *N. occidentalis* (dall); specimens from Hawaiian Islands; Kingsley, Bull. Essex; pl. ii. fig. 1.

Nephropsis atlantica, sp. n., Norman, P. R. Soc. Edin. p. 684, Farøe Channel, 555 fath. *N. elegans* Ag. u.

THALASSINIDÆ.

Callinassa martensi, sp. n., and *mauritiana* (Miers); Miers, P. Z. S. 1884, p. 13, pl. i. figs. 1 & 2, Mauritius.

Axiu plectrorhynchus (? Strahl), Port Molle: description; *id.* Zool. Coll. Alert, p. 282.

Evaxius, g. n. Distinct from *Gebia* and *Axiu* by the absence of the antennal scale; second pair of feet chelate. *E. tricarinatus*, sp. n., Zan-zibar; a single imperfect specimen, lacking the first pair of feet. Kingsley, Bull. Essex. Inst. xiv. p. 130, pl. i. fig. 1.

Gebiopsis darwini, sp. n., Miers, t. c. p. 281, pl. xxxii. fig. a, Port Darwin.

CRANGONIDÆ.

Crangon tenuifrons, sp. n., Kodiak Archipelago, Alaska, *vulgaris* (F.), also on the West and East coasts of America, varieties, *batei*, new name for *intermedius* (Bate, nec Stimpson, 1860), *boreas* (Phipps) and *franciscorum* (Stimps.); Kingsley, t. c. pp. 128 & 129, pl. i. figs. 5-7 & 9.

Nectocrangon alaskensis, sp. n., *id.* t. c. p. 128, Kodiak Archipelago.

Hippolysmata wurdmanni (Stimps.) and *intermedia* (Kingsl.); *id. ibid.* pl. i. figs. 4 & 8.

ATYIDÆ.

Caridina africana, sp. n., Kingsley, *t. c.* p. 127, pl. i. fig. 3, Zulu Mission, S. Africa.

ALPHEIDÆ and PALÆMONIDÆ.

Alpheus, including *Betulus* (Dana) : the known species, 96, enumerated and arranged in groups, with synonymy and localities ; chelæ of *A. packardii* (Kingsl.), *lavigatus* (Guer.), *harfordi* (Kingsl.), *websteri* (Kingsl.), *sinuosus* (Guer.), *thetis* (White), and *floridanus* (Kingsl.), figured : *id.* *t. c.* pp. 109-127, pl. ii. figs. 2-8.

Alpheus edwardsi (Aud.), *minor* (Say) var. *neptunus* (Dana), variability and synonymy, *comatularum* (Hasw.), Torres Straits, description ; Miers, Zool. Coll. Alert, pp. 284-290.

Hippolyte polaris (Ross), Behring Sea. Variability in the rostrum ; external flagella of the inner antennæ much longer in the males than in the females. Richters, *Abh. senck. Ges.* 1884, p. 406, figs. 11-15.

Bythocaris gracilis and *nana*, spp. nn., East coast of N. America, 35°-40° N. lat., 65-142 fath., S. Smith, P. U. S. Nat. Mus. vii. pp. 497-500.

Palaemonetes, *anavirevirostris*, sp. n., Miers, Zool. Coll. Alert. p. 562, Seychelles, F. HILGENDORF 1884, *Ichthyodites tridacnæ* (Peters). Specimens from Torres boid corpuscle, p. 290.

elements, *Varis*? *tridentata*, sp. n., *id.* *t. c.* p. 294, pl. xxii. fig. c, Torres tail and

Harpilius inermis, sp. n., *id.* *t. c.* p. 291, pl. xxxii. fig. b, Port Molle ; found in the interior of the shell of *Pinna* ; another closely allied species from the interior of *Tridacna*.

Anchistia petittouarsi (? Aud.) = *grandis* (Stimps.), Port Molle ; *id.* *t. c.* p. 293.

Palaemon africanus, sp. n., West coast of Africa, *longimanus* (Fabr.) = *lar* (Fabr.) = *ornatus* (Oliv.), *P. ohionis* (Smith), localities, *sinensis* (Heller) from Japan, *acanthurus* (Wiegman), from West coast of Nicaragua ; Kingsley, Bull. Essex Inst. xiv. pp. 107 & 108.

Leander hammondii, sp. n., *id.* *t. c.* p. 108, pl. i. fig. 2, Baker's Island, N. Pacific.

Nematocarcinus gracilipes, sp. n., A. Milne-Edwards, Crustacea of the Talisman [vide *supra*, p. 9].

Glyphus, g. n. Lateral portions of the abdominal segments in the female developed into a sort of pouch for the reception of the eggs. G. *marsupialis*, sp. n. *Id.* *t. c.*

PENÆIDÆ.

Pasiphaea sivado (Risso) ; Fish, Naturalist (2) x. p. 93.

Parapasiphae, g. n., S. Smith, Ann. Rep. Comm. Fish. for 1882, p. 345, N. Atlantic.

Hymenodora glacialis (Buchholz, *Pasiphue*), East coast of N. America, 35°–40° N. lat., 861–2949 fath. ; S. Smith, P. U. S. Nat. Mus. vii. pp. 501 & 502.

Acantheephyra microphthalmia and *brevirostris*, spp. nn., *id. t. c.* pp. 502 & 506, East coast of N. America, 36°–39° N. lat., 1395–2949 fath. [1885].

Ephyrina, g. n. Distinct from *Acantheephyra* by the ischial and meral segments of the first pereopods being compressed, very broad, and forming broad lamellar opercula along the sides of the carapace ; rostrum unarmed ; pleon not keeled. *E. benedicti*, sp. n., East coast of N. America, 40° N. lat., 959 fath. *Id. t. c.* p. 506 [1885].

Xiphocaris (Martens) not identical with *Caulurus* (Stimps.) ; mandibles as in the *Atyidae* : Kingsley, Bull. Essex Inst. xiv. p. 127.

Penaeus. Specimens and localities in the collections of Salem, Boston, and Philadelphia ; *id. t. c.* pp. 105–107.

Penaeus batei, sp. n., Miers, Zool. Coll. Alert, p. 296, pl. xxxii. fig. d. Albany Island, Australia. *P. dobsoni* (Miers) distinct from *styliferus* (Milne-Edw.) ; *id. ibid.*, footnote. *P. richtersi*, sp. n., Cerf Island, Mascarenes, and notes on some other species ; *id. t. c.* pp. 563–565, pl. lii. fig. a.

Solenocera lucasii (S. Bate) ? Small female from Mauritius described ; *id. P. Z. S.* 1884, p. 15.

Heterocarpus, g. n. The last two pairs of legs long and articulated like antennæ. West of Morocco, 1000–1500 metres. *A. m. ...* 'wards, C.R. xcvii. p. 389, and Ann. N. H. (5) xiii. p. 224.

Benthonectes, g. n. Near *Benthoecetes*. Dactyli of the pereopods multiarticulate, flagelliform ; mandibles with process of the crowns ; mandibular palpi narrow. *B. filipes*, and *elegans* N. America, 39° N. lat., 693–1043 fath. ; probably *Benthesicymus*. *B. letti* (A. Milne-Edw., nec S. Smith) is the same species. S. Smith, Ann. Rep. Comm. Fish. for 1882 [published 1884], p. 345, and P. U. S. Nat. Mus. vii. pp. 509–511 [1885].

SCHIZOPODA.

EUPHAUSIIDÆ.

Euphausia pellucida (Dana) = *muelleri* (Dohrn) = *Thysanopoda bidentata* (G. O. Sars), North and South Atlantic, North and South Pacific ; *E. similis*, South Atlantic, *murrayi* and *antarctica*, Antarctic Ocean, near the ice barrier, *mucronata*, off the coast of Chili, *gibba*, North Atlantic and Tropical Pacific, and *spinifera*, Arafura and Celebes Seas, spp. nn. : G. O. Sars, Forh. Selsk. Chr. 1883, No. 7, pp. 12–19.

Gnathophausia calcarata, *willemoesii*, *elegans*, and *longispina*, spp. nn., Indian and Pacific Oceans, 255–1425 fath., and *affinis*, sp. n., Tropical Atlantic, 1500 fath., *id. t. c.* pp. 5–8.

Thysanopoda obtusifrons, South Pacific, *cristata*, off Mindanao, 2050 fath., and ? *amblyops*, off Tristan d'Acunha, 1000 fath., spp. nn., *id. t. c.* pp. 21–23.

Thysanoessa. A specimen carrying eggs in an elongated and flattened

mass beneath the cephalothorax, attached principally to the third pair of pereopods, from the East coast of North America, in 1067 fath.; S. Smith, *Ann. J. Sci.* (3) xxviii. p. 54.

Thysanoessa gregaria, sp. n., South Atlantic, Subantarctic and Pacific Oceans, and *macrura*, sp. n., Antarctic Ocean, near the ice barrier, and off Kerguelen, surface, G. O. Sars, *t. c.* p. 26.

Nyctiphanes, g. n. Basal joint of the antennular peduncle provided above at the end with a membranous reflexed leaflet; seventh pair of legs distinctly developed, the stem only consisting of two elongated and densely ciliated joints, beside the basal portion; last pair of legs quite rudimentary, forming a very small inarticulated stem. *N. australis*, sp. n., Bass Strait and Port Jackson. Also *Thysanopoda couchii* (Bell) and *norvegica* (Sars), belong to this genus. *Id. t. c.* pp. 23 & 24.

Nematoscelis, g. n. Near *Thysanoessa*. Second pair of legs greatly elongated and very narrow, filiform, almost quite naked. *N. megalops*, South Atlantic, surface, *microps*, North Atlantic and North Pacific, *tenella*, Tropical and Southern Atlantic and Pacific, *rostrata*, Tropical Atlantic, all spp. nn. *Id. t. c.* pp. 27-29.

LOPHOGASTRIDÆ.

Cer. 684, and g. n. Antennal scale forming a narrow flexuous plate of F. HILGENDORF, but without any setæ; carapace large, covering the 1883 [see Zool. division] of the body, even the eyes and antennular boid corpuscle terminating in a mucroniform rostrum; last pair of legs elements, the exopodites or natatory branches; uropods very small, the tail and short, lanceolate and setose on both margins. *C. hamata*, sp. n., Pacific, Api to Cape York. *Id. t. c.* pp. 3 & 4.

EUCOPIIDÆ.

Eucopia (Dana, 1852) = *Chalaraspis* (Will. Suhm); *E. australis* (Dana) = *C. unguiculata* (Will. Suhm), North Atlantic, 1000-1250 fath., Subantarctic Sea, 1800 fath., North Pacific, 1875 fath.: *id. t. c.* pp. 9 & 10.

MYSIDÆ.

Boreomysis nobilis (G. O. Sars), Færoe Channel, 540 fath.; Norman, P. R. Soc. Edinb. xi. p. 687. *B. obtusata*, North Pacific, 2740 fath., and *microps*, North Atlantic, 1250 fath., spp. nn., G. O. Sars, *t. c.* p. 35.

Amblyops crozetii (Will. Suhm, MS.), off Crozet Island, 1600 fath., and *australis*, Bass Strait, 38 fath., spp. nn., *id. t. c.* pp. 36 & 37.

Pseudomma sarsii (Will. Suhm, MS.), sp. n., Kerguelen, 120 fath., and Antarctic Ocean, 1675 fath., *id. t. c.* p. 37.

Anchialus truncatus, off the Cape of Good Hope, surface, and *angustus*, off Bass Strait, 38 fath., spp. nn., *id. t. c.* pp. 38 & 39.

Mysidopsis? incisa, sp. n., off Bass Strait, 38 fath., *id. t. c.* p. 39.

Euchætomera, g. n. Very strong setæ on the legs; pleopoda, uropoda,

and antennal scales; telson very short, lamelliform. *E. typica*, North Pacific, surface, and *tenuis*, off the coast of Chili, spp. nn. G. O. Sars, *t. c.* pp. 41 & 42.

Promysis? pusilla, sp. n., Celebes Sea, *id. t. c.* p. 42.

STOMAPODA.

SQUILLIDÆ.

Gonodactylus trachurus (Martens) from Mauritius; Miers, P. Z. S. 1884, p. 16, pl. i. fig. 3. *G. elegans*, sp. n., *id.* Zool. Coll. Alert, p. 566, pl. lii. fig. b, Providence Island, Mascarenes.

AMPHIPODA.

A. GERSTÄCKER continues his treatise on the *Crustacea*, in Bronn's Klassen u. Ordnungen des Thierreichs, describing at length, in Parts 11-15, the organization and embryology of the *Amphipoda*, and giving some general notes concerning their size and colours; pls. xxix.-xxxvi. represent the external forms of many genera of *Amphipoda*s (Plat. xxxvii. & xxxviii., *Caprellidæ* and *Cyamus*; pls. xxxix.-xlv., *tt.* Inst. xiv. p. 131, xlvii. & xlviii., the embryology of them.

pb. xi. 1881-82,

ORCHESTIIDÆ.

Allorchestes crassicornis (Haswell) var. n. *coogeeensis*, Coogee Bay, Haswell, P. Linn. Soc. N. S. W. ix. p. 1035, pl. xlv. fig. 1.

GAMMARIDÆ.

Leucothoe spinicarpa (Abildg.) = *articulosa* (Mont.) var. *commensalis* (Hasw.), Port Jackson, and *L. brevidigitata*, sp. n., Torres Straits; Miers, Zool. Coll. Alert. pp. 312 & 313, the latter, pl. xxxiv. fig. a.

Atylus. Notes on some Australian species; Haswell, *t. c.* p. 1037.

Mera diversimanus, sp. n., Miers, Zool. Coll. Alert. p. 567, pl. lii. fig. d, Seychelles. *M. ramsayi* (Hasw.), Port Jackson and Torres Straits, *rubromaculata* (? Stimps.), Port Molle, and *crassimana*, sp. n., Port Jackson; *id. t. c.* pp. 315 & 316. *M. festiva*, sp. n., Sydney Harbour, and *M. petriei* (Thoms.) probably = *Megamcera subcarinata* (Hasw.), sexual differences; Haswell, P. Linn. Soc. N. S. W. ix. pp. 1037-1039, the former, pl. xlv. fig. 2. *M. petriei* (Thoms.) = *Megamcera subcarinata* (Hasw.); Chilton, N. Z. J. Sci. ii. p. 230.

Megamcera sp. from Port Jackson, *suensis* (? Hasw.), Port Denison, and *thomsoni*, sp. n., Torres Straits; Miers, Zool. Coll. Alert, pp. 317-319, the last, pl. xxxiv. fig. b.

Ampelisca compacta, sp. n., Norman, P. R. Soc. Edinb. xi. 1881-82, p. 688, Færoe Channel, 530 fath.

Microdentopus mortoni and *tenuipes* (Hasw.). Additions to their description : Haswell, P. Linn. Soc. N. S. W. ix. pp. 1040 & 1041.

Glycerina affinis, sp. n., *id. t. c.* p. 1036, pl. xlvii. fig. 1, Sydney Harbour.

Halirages elegans, sp. n., Norman, P. R. Soc. Edinb. xi. p. 688, Færoe Channel, 540 fath.

CAPRELLIDÆ.

Caprella attenuata (P. Dana), Port Jackson ; Miers, Zool. Coll. Alert, p. 321, pl. xxxiv. fig. c.

Proto condylata and *spinosa*, spp. nn., Haswell, P. Linn. Soc. N. S. W. ix. pp. 993-997, pls. xlviii. figs. 1-4, & xlix. fig. 1, Australia ; and critical notes on other Australian *Caprellidæ*, *t. c.* pp. 997-1000. *Protella australis* (Haswell) figured, pl. xlix. figs. 2-4 ; a further note on the last, *t. c.* p. 1042.

ISOPODA.

Abstract of HUET's paper on the anatomy of the *Isopoda* [Zool. Rec. xx. Crust. p. 20] in Am. Nat. xviii. pp. 637 & 638. Critical remarks on the *Antonia* ? of M. WEBER, Bijdr. Dierk. 1884, p. 39. Anatomy of *Glypto-* valves. *et* WEBER [vide *suprà*, p. 5].

Antonia (Cuv. Straits; *id. t.*

TANAIDÆ.

Corallio oerstedii (Kröy.) = *T. rhynchites* and *balticus* (F. Müll.), fully described from specimens found at Kiel, externally and anatomically, by H. Blanc ; he comes finally to the conclusion that the *Tanaidæ* belong rather to the *Isopoda* than to the *Amphipoda* : Rec. Z. Suisse, i. pp. 189-258, pls. x.-xii. [abstract in J. R. Micr. Soc. (2) iv. p. 501]. *T. willemoesii*, sp. n., Studer, Isop. Gazell. p. 24, pl. ii. fig. 10, Kerguelen, 120 fath. *T. tenuicornis* (Haswell, 1882, as *Paratanais*) redescribed ; Haswell, P. Linn. Soc. N. S. W. ix. p. 1006, pl. i. figs. 1-8, Port Jackson.

Paratanais linearis, sp. n., *id. t. c.* p. 1008, pl. i. figs. 9-16, Port Jackson ; *P. ignotus*, sp. n., *id. t. c.* p. 1042, pls. xlvii. fig. 2, & xlv. fig. 3, locality not indicated.

Apseudes latreillii (M.-Edw.). Adriatic specimens, their organization, chiefly the hairy appendages, fully described by C. CLAUS ; the eye is not stalked, but quite sessile, with a long spine in front of it ; the internal gill and respiratory cavity covered by a duplicature of the dorsal integument, and some other points indicate a closer relation to the *Schizopoda* and *Descapoda*. Arb. z. Inst. Wien, v. pp. 319-330, 2 pls. *A. spectabilis*, sp. n., Studer, Isop. Gazell. p. 23, pl. ii. fig. 9, Kerguelen.

Stylocheiron, g. n. Third pair of legs greatly developed, geniculate ; third and fourth joint very much elongated, without setæ ; fifth joint suddenly rather swollen, and provided with strong setæ, which impinge against the curved spines of the small terminal joint, both together forming a grasping organ. *S. carinatum*, Tropical Pacific and Celebes Sea,

surface, *suhmii*, North of New Guinea, *longicorne* and *elongatum*, South Atlantic, *abbreviatum*, Australian and Celebes Sea, all spp. nn. G. O. Sars, *t. c.* pp. 29-33.

GNATHIIDÆ.

Anceus danielii, sp. n., Brest. Both sexes and all ages found on the same spot, on loamy ground, between the roots of plants; Hesse, Ann. Sci. Nat. (6) xvii. Art. 6, 11 pp., pl. xviii. [abstract in J. R. Micr. Soc. (2) iv. p. 744].

Anceus ferox, sp. n., Haswell, *t. c.* p. 1005, pl. lii. figs. 1-5, Port Jackson. *A. antarcticus*, sp. n., Studer, Isop. Gazell. p. 4, Patagonia, 60 fath.

ANTHURIIDÆ.

Paranthura brachiata (Harger) = *arctica* (Heller), circumpolar; Weber, Bijdr. Dierk. 1884, pp. 4 & 5.

Paranthura dimenensis, sp. n., Hobart Town, *miersi*, sp. n., Port Jackson, and variation of *crassicornis* (Haswell, 1881); Haswell, P. Linn. Soc. N. S. W. ix. pp. 1011-1013, pls. lii. figs. 5-13, & liii. figs. 2-5, 8, & 9. *P. australis* (Haw.): addition to its description, by Miers, Zool. Coll. Alert, p. 311.

Haliophasma purpureum (Hasw., 1881): antenna; Haswell, *t. c.* p. 1014, pl. liii. figs. 6 & 7.

Eisothistos, g. n. Body narrow, almost cylindrical; first segment of thorax very short, not much larger than the head, the following increasing gradually in length and breadth in the female, very long and attenuated in the male; first pair of feet not subchelate, similar to the following. *E. vermiformis*, sp. n., Watson's Bay, Australia, dwelling in tubes of *Vermilia*, the telson and expanded posterior appendages mimicking the operculum and branchiæ of a small *Serpula*; embryo in the egg bent to the dorsal side. Haswell, *t. c.* pp. 676-678, pls. xxxvi. & xxxvii., both sexes and larva figured.

IDOTEIDÆ.

Arcturus furcatus (Studer, 1882), Kerguelen, 60 fath., full description; Studer, Isop. Gazell. pp. 12-14, pl. i. fig. 3.

Arcturides cornutus (Studer, 1882), S. Indian Ocean, 64° E. long., 47° S. lat., 115 fath., full description; *id. t. c.* pp. 15-17, pl. i. fig. 4.

Glyptonotus sabini (Krøyer). No eyes; abdominal segments 4 in young specimens, 5 in older ones; also the number of joints in the outer antennæ variable according to sex and age; oral and sexual organs described; secondary sexual differences pointed out; other anatomical notes. Weber, Bijdr. Dierk. 1884, pp. 8-31, pls. i., ii., & iii. figs. 21-23.

Idothea miersii, sp. n., Studer, *t. c.* p. 17, pl. i. fig. 5, E. Coast of S. America, 47° S. lat., 63 fath.

MUNNOPSIDÆ.

Munnopsidæ typica (Sars); Weber, Bijdr. Dierk. 1884, p. 31, pl. iii. figs. 27 & 28.

ASELLIDÆ.

Ianthe borallii, sp. n., Studer, t. c. p. 10, pl. i. fig. 2, East of S. America, 47° S. lat.

Stenotrium (Haswell, 1881) belongs to the *Asellidæ*, in spite of the four anterior pairs of thoracic appendages being directed forwards. *S. armatum*, male described. Haswell, t. c. pp. 1009 & 1010, pl. li. figs. 1-12.

ONISCIDÆ.

Ligia gaudichaudii var. *australiensis* (? Dana), Port Molle; Miers, Zool. Coll. Alert, p. 299.

Philougria marina, sp. n., Chilton, P. Linn. Soc. N. S. W. ix. 3. pp. 463-466, pl. xi., Coogee Bay, near Sydney, on the under surface of stones which were completely covered by sea-water in rock-pools near high-water mark.

Porcellio ornatus (M.-Edw.), Aguilas, in Spain; Weyers, C.R. ent. Belg. (3) No. 49, pp. cclxi.

Armadillo tongensis (Budde Lund, MS.), sp. n., Studer, Isop. Gazell. p. 5, Vavau, Tonga Islands.

[See also *suprà*, p. 5.]

SEROLIDÆ.

Serolis. Full generic description; anatomical and embryological particulars concerning several species; list of 22 species, 16 of which have been collected by H.M.S. 'Challenger,' and fully described and figured, with notes on the geographical and bathymetrical distribution, by F. E. BEDDARD, Zool. Challeng. xi, 25 pp., 10 pls. The following 9 are new, and have also been described by the same, in P. Z. S. 1884:—*S. bromleyana* (Will. Subm. MS.), *neera*, *gracilis*, *antarctica*, *australiensis*, *elongata*, *pallida*, *longicaudata*, and *minuta*, all spp. nn., collected during the 'Challenger' Expedition at various stations. The whole genus is confined to the southern hemisphere, except 2 recently described species from California and the Senegal; the shallow-water species occur no further north than 30° S. lat., where they inhabit the shores of all continents and the principal groups of islands; the deep-water species range near to the equator. The greatest depth from which a specimen has been obtained is 2040 fath. The eyes of the shallow-water species are well developed; those of the abyssal ones are more or less imperfect, without retinula, or even altogether wanting, as in *S. antarctica*. *Id.* t. c. pp. 330-341. n°

Serolis (Leacu). General notes on this genus, sexual differences, &c., and description of 6 species from Crozet Islands, Kerguelen, and Magellan Straits [cf. Zool. Rec. xvi. Crust. p. 38]; *oralis* (Stud., 1879) = *septemcarinata* (Miers, 1875): Studer, Isop. Gazell. pp. 6-10; *S. convexa* (Cunningh.), *id.* t. c. pl. i. fig. 1.

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SPHÆROMIDÆ.

Cymodocea longistylis, sp. n., Miers, Zool. Coll. Alert, p. 306, pl. xxiii. fig. c, Torres Straits. *C. darwinii* (Cunningh.), E. coast of S. America, 47° S. lat.; Studer, Isop. Gazell. p. 18, pl. ii. fig. 6.

Nescea latreillei (Leach): sexual difference and mechanism of rolling up; *id. t. c. p. 21.*

Haswellia, new name for *Calyptura* (Haswell, 1881), which is pre-occupied; *H. carnea* (Hasw.), Port Jackson: Miers, Zool. Coll. Alert, p. 311.

Cilicæa latreillei (Leach), its female is *Sphæroma pubescens* (M.-Edw.), Port Jackson and Torres Straits; var. *crassicaudata* (Hasw.), Arafura Sea: *id. t. c. pp. 308 & 309.*

Cerceis bidentata (M.-Edw.) var. n. *aspericaudata*, Torres Straits; *id. t. c. p. 306*, pl. xxiii. fig. d.

Cassidina emarginata (Guer.-Menev.), Magellan Straits, sexual differences, and *maculata*, sp. n., Kerguelen; Studer, Isop. Gazell. pp. 19 & 20, the latter pl. ii. fig. 7.

CIROLANIDÆ.

Cirolana schiædtei, sp. n., Arafura Sea, *tenuistylis*, Torres Straits, and *lata* (Hasw.) var. n. *integra*, Albany Island, Miers, *t. c.* Miers, Zool. Coll. Alert, the two former pl. xxiii. figs. a & b. *C. levis*, sp. n., Port Jackson, *id. t. c. p. 21*, pl. ii. fig. 8, off Queensland, 90 fath. *C. concharum* (Hasw.), *id. t. c. p. 1014*, host; Lockwood, J. R. Micr. Soc. (2) iv. p. 51.

ÆGIDÆ.

Æga psora (Lützk.) and *ventrosa* (M. Sars): differences of sex and age; Weber, Bijdr. Dierk. 1884, pp. 5 & 6, pl. iii. figs. 24-26. *Æ. meinerti*, sp. n., Miers, *t. c. p. 305*, King George's Sound, Australia.

Rocinela orientalis (Schiödte & Meinert), Torres Straits. Doubts concerning the constancy of the number of joints of the antennal flagellum as a character of species; *id. ibid.*

Conilera cylindracea devouring the internal parts of dog-fish, *Acanthias vulgaris*, note; F. Day, P. Z. S. 1884, p. 44.

CYMOTHOIDÆ.

Ceratothoa imbricata (Fabr.) = *banksii* (Leach) = *trigonocephala* (M.-Edw.), Port Jackson; Miers, Zool. Coll. Alert, p. 300.

Bregmocerella, g. n. Oral region immediately in front of the epistome produced forwards into a long horn-like process; last segment produced, pointed; uropods with the outer (mobile) ramus rudimentary. - *B. tricornis*, sp. n., Port Jackson. Haswell, P. Linn. Soc. N. S. W. ix. p. 1004, pl. liii. fig. 1.

BOPYRIDÆ.

Phryxus abdominalis (Kröy.) and *Gyge hippolytes* (Kröy.): notes on them by Weber, Bijdr. Dierk. 1884, pp. 34 & 35.

CRYPTONISCIDÆ.

R. KOSSMANN gives an historical account of the knowledge of the *Cryptoniscidae*, a list of the known genera, and discusses some peculiarities, combining his own new researches with those of other authors. All individuals are probably protandric hermaphrodites; that is to say, they act as males in a larval stage, being then capable of free locomotion, and as females in a later, sedentary, and parasitic stage of life. The cavity in which the eggs are deposited and ripened is an invagination from the outside of the body, and therefore the openings of the oviducts are in this cavity. The so-called liver is in reality a digestive gland, in which the food, that is to say, the blood of other *Crustacea* on which these parasites feed, is contained and digested, the intestine becoming in the parasitic stage more or less reduced. SB. Ak. Berl. 1884, pp. 457-473. The genera are distinguished by him as follows:—

I. Parasitic on Cirripeds.

- A. On *Balanus* and *Creusia* . . . 1. *Cryptothir*, Dana, 1852, =
Hemioniscus, Buch., 1866.
- B. On parasitic Cirripeds.
- aa Free in the mantle cavity 2. *Eumetor*, Kossm., 1872.
- bb Perforating the mantle 3. *Liriopsis*, M. Schultze, 1859,
 from inside. = *Liriope*, Rathke, 1843.
- cc *Madillo tongen.* rking the stalk from
 outside.
- p. 5, Vawau, Tonga 4. *Cyproniscus*, F. Müll., 1870.
- [See also *supra*,
 aaa Cephalon short; on
Peltogaster.
- Serolis* - bbb Cephalon long, im- 5. *Zeuxo*, Kossm., 1872.
 merged; on *Sac-*
culina.

II. Parasitic on *Ostracoda* 6. *Cyproniscus*, g. n.III. Parasitic on *Isopoda* 7. *Cabirops*, g. n.

Cabirops, new name for *Cubira* (Kossmann, 1872, preoccupied); Kossmann, SB. Ak. Berl. 1884, p. 460.

Cyproniscus, g. n., based on the crustacean described by G. O. Sars as *Cryptothiria*, in Oversigt af Norges Crustaceer, Forh. Selsk. Chr. 1882, p. 73, but not characterized; *id. ibid.* [Translated in Ann. N. H. (5) xiv. pp. 1-57.]

CLADOCERA.

C. L. HERRICK's final Report on the *Crustacea* of Minnesota gives general descriptions of and also partly figures not only some of the N. American, but also of many European genera and species, partly taken from European authors, with numerous biological and critical remarks, so that it can serve as a manual for the knowledge of them generally. The enemies of them are treated in the introduction, pp. 8-12; a phylogenetic pedigree of the genera is attempted, p. 15. In the following only those species will be mentioned which are N. American, and have been examined and more fully described by the author.

M. v. D. BORNE observes that temporary drying up of a pond is very

favourable to the multiplication of the *Daphniidæ*; Circ. deutsch. Fisch. Ver. 1884, p. 99. Popular notice of the *Daphniidæ* by V. d. Wengen; t. c. p. 122.

SIDIDÆ.

Pseudosida, g. n. Distinguished from *Sida* by the 3-jointed antenna and the great number of setæ on the 2-jointed ramus; flagellum of the antennulæ long also in the female. *P. bidentata*, sp. n., Mobile Bay, Alabama. Herrick, Crust. Minnesota, p. 20, pl. k, fig. 9.

DAPHNIIDÆ.

Daphnia pulex var. n. *nasutus*, Alabama and near Lake Superior; *D. minnehaha*, sp. n., Minnehaha Creek, *rosea* (Sars), *hyalina* (Leydig), *galeata* (Sars), *dubia* (Herr.), *kalbergensis* (Schödl.), and *magniceps*, sp. n., all in N. America: *id. op. cit.* pp. 56-67, pls. I, K, L, N, T, & U.

Simocephalus ongener (Birge), Minnesota, *rostratus*, sp. n., Ocean Springs, Mississippi, and *daphnoides* (Herr.), Tennessee river; *id. op. cit.* pp. 47 & 48.

Ceriodaphnia scitula, sp. n., *id. op. cit.* p. 40, pl. B, figs. 5-7, Minnesota.

Scapholeberis armata and *angulata* (Herrick) and *nasuta* (Birge); *id. op. cit.* pp. 43 & 44, pls. B, figs. 9-11, & T, fig. 7, Alabama. *S. nasuta* (Birge) = *aurita* (Fisch.); *id. op. cit.* p. 175.

Moina rectirostris (Müll.) and *paradoxa* (Weism., 1877), also in the Mississippi Valley; *id. op. cit.* p. 34, pl. A, figs. 1-11.

LYNCODAPHNIIDÆ.

Macrothrix tenuicornis (Kurz) and *pauper* (Herr.), Minnesota; *id. op. cit.* p. 70, pl. C, figs. 1-4 & 12.

Lyncodaphnia macrothroides [*macrotrichoides*] (Herr.), larger lakes of Minnesota; *id. op. cit.* pp. 74 & 75, pls. B, figs. 12 & 13, & B 1, figs. 1 & 3.

Ilyocryptus spinifer (Herr.), Minnesota; *id. op. cit.* p. 77, pl. C, figs. 18 & 19.

LYNCEIDÆ.

Acroperus leucocephalus (Koch), American form; *id. op. cit.* p. 82, pl. E, fig. 5.

Cumtrocercus macrurus (Müll.) and *rotundus* (Herr.), Minnesota; *id. op. cit.* pp. 83 & 84, the former, pl. E, fig. 10.

Alonopsis latissima (Kurz) and *media* (Birge) var., Minnesota; *id. op. cit.* pp. 86 & 87, pls. E, figs. 8 & 9, & G, figs. 1 & 9.

Leydigia quadrangularis (Leyd.), Alabama; *id. op. cit.* p. 88, pl. H, fig. 4.

Graptoleberis testudinaria (Leyd.) var.; *id. op. cit.* p. 90.

Alona lineata (Fischer) var., *quadrangularis* (Müll.), *affinis* (Leyd.), all from Minnesota, *A. glacialis* (Birge) varr. nn. *tuberculata* and *levig.*; *id. op. cit.* pp. 96-101, pls. E, figs. 1 & 2, F, fig. 14, & G, figs. 4-7 & 14.

Alonella pulchella, sp. n., and *excisa* (Fischer), Minnesota; *id. op. cit.* pp. 103 & 104, pls. Q, figs. 1-3, E, fig. 6, & G, figs. 10 & 11.

Pleuroxus affinis, sp. n., Alabama, and *denticulatus*, *humatus*, *unidens*, and *procurvus* (Birge), Minnesota, Tennessee, and Alabama; *id. op. cit.* pp. 110-113, pls. E, figs. 3 & 4, F, fig. 15, G, figs. 12 & 13, & H, figs. 1 & 2.

Chydorus sphaericus (Müll.), *globosus* (Baird), and *calatus* (Schödl.), Minnesota; Herrick, *op. cit.* pp. 116 & 117, pl. F, figs. 1-12.

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POLYPHEMIDÆ.

Polyphemus pediculus (Geer) observed in mountain ponds in Silesia, by O. Zacharias, Z. wiss. Zool. xli. p. 252. Spermatozooids; vide *suprà*, p. 6.

OSTRACODA.

Rudiment of a shell-gland near the eye in *Xestoleberis nitida* (Lillj.); W. Müller, Arch. f. Nat. l. p. 14, pl. ii. fig. 14.

Function of the antennal gland of the *Cytheridæ* for spinning a glutinous thread; *id. t. c.* pp. 213-216.

Anatomical notes concerning the genital organs by the same [vide *suprà*, p. 6].

SEGUENZA continues his notes on the *Ostracoda* of the quaternary bed at Rizzolo, Sicily, in Nat. Sicil. iii. pp. 115-118, 141-145, 179-183, 223-227, 262-266, 287-291, 308-311, & 349-352, pls. i. & ii. (partly). The species which are figured will be mentioned hereafter.

Palæozoic N. American species of *Leperditia*, *Isochilina*, and *Primitia*; R. Jones, Ann. N. H. (5) xiv. pp. 339-347.

CYPRIDÆ.

Bairdia subdeltoidea (Münster) numerous at Messina in the living state, and *messanensis*, sp. n., same locality; Seguenza, Nat. Sicil. iii. pp. 124-127, the former, pl. i. fig. 8.

CYTHERIDÆ.

List of species found in the German and Baltic Seas; W. Müller, Arch. f. Nat. l. pp. 12-17.

Cythere venus, sp. n., Rizzolo, Quarternary, with var. n. *messanensis*, living at Messina; Seguenza, *t. c.* pp. 49 & 149, pl. i. fig. 7. *C. pellucida* (Baird) var. n. *gracilis*, and *C. mirabilis*, sp. n.; *id. t. c.* pp. 179 & 223, pls. i. fig. 10, & ii. fig. 4, Rizzolo, Quarternary.

Cytheridea torosa (Brady, 1864) = *lutea* (W. Müll., 1880), observed at Greifswald; W. Müller, *t. c.* p. 13.

Loxoconcha arellana (Brady, *Normania*) var. n. *mediterranea*, *L. tenuis* and *seminulum*, spp. nn.; Seguenza, *t. c.* pp. 254-256, pls. i. fig. 10, & ii. figs. 1 & 2, Messina.

Elpidium bræmelærum (F. Müll.) spinning; W. Müller, *t. c.* pp. 213-216.

Xestoleberis producta (Seguenza) and *saccata*, sp. n., Seguenza, *t. c.* pp. 319 & 321, pl. i. figs. 13 & 14, Messina. *X. compressa*, sp. n., *id. op. cit.* iv. p. 45, pl. ii. fig. 3, Messina.

Cytherura exagonulis [hexag-], sp. n., *id. t. c.* p. 47, pl. ii. fig. 4, Messina.

Cytheroïs. g. n. Mouth somewhat more produced than ordinarily, upper and lower lip coalesced, forming a suctorial disk; first antennæ,

flagellum of the second antennæ, and mandibular palps lengthened. By this formation of the oral parts this genus approaches *Paradoxostoma*, and is probably also suctorial, but the maxillæ are as in the o^r *Cytheridæ*. *C. virens*, sp. n., Sylt Island, Sleavic; very agile. W. Müller, Arch. f. Nat. 1. pp. 15-17, pl. ii. figs. 10-13.

Paradoxostoma. Notes on two undetermined species in the North Sea; *id. t. c.* p. 15, pl. ii. fig. 16.

CYPRIDINIDÆ.

Cypridina concinna (Jones) ? var. *problematica*, *C. foveolata*, sp. n., *clathrata* (Reuss), *deformis* (Reuss) var. n. *edentula*, and *C. bimamillata*, sp. n., Seguenza, Nat. Sicil. iii. pp. 116, 117, 141, 262, & 265, pls. i. fig. 10, & ii. figs. 2, 3, 5, & 6, Rizzolo, Quarternary.

Palæozoic *Entomis* and *Entomidella*; R. Jones, Ann. N. H. (5) xiv. pp. 391-402, pl. xv.

COPEPODA.

C. L. HERRICK's final Report of the *Crustacea* of Minnesota contains a general account and special descriptions of the non-parasitic fresh-water genera of this Order, not only from N. America, but also from Europe, partly taken from European authors, with many figures. Their enemies are treated of in the introduction, pp. 8-12.

ARGULIDÆ.

Argulus. Four North American species, found on several species of fishes; also marine ones; enumerated by R. Rathbun, P. U. S. Nat. Mus. vii. pp. 484 & 485.

CALANIDÆ.

Calanus cristatus (Kröy.), from Behring's Sea; Poppe, Arch. f. Nat. 1. pp. 282-286, pl. xx. figs. 1-6.

Temora affinis (Poppe), also in the Gulf of Mexico; Herrick, *op. cit.* p. 182.

Diaptomus minnetonka, sp. n., Lake Minnetonka, *sanguineus* (Forb.), *gigas* (Forb.) var. *maximus* (Herr.), *longirostris* (Herr.) var. *leopus* (Forb.) and var. n. *similis*, and *D. pallidus* (Herr.) with var. *sicilis* (Herr.), all in the United States of North America; *id. op. cit.* pp. 135-142, pl. q, figs. 5-13, 17, & 18.

Pseudodiaptomus, g. n. Near *Diaptomus* and *Metridia*; eye small; antennæ appearing 22-jointed in both sexes, the right geniculate in the male; inner branch of the antennulæ seeming but two or three jointed; both rami of the first pair of feet 3-jointed; inner ramus of the fifth pair in the male nearly as in *Diaptomus*, in the female rather slender, simple, 3-jointed; spermatophore large, pear-shaped. *P. pelagicus*, sp. n., Mississippi Sound, Gulf of Mexico. *Id. op. cit.* pp. 180 & 181.

Epiischura lacustris (Forbes), Minnesota, and *fluvialilis* (Herrick), Alabama; *id. op. cit.* pp. 131-133, pl. q, figs. 14-16.

CYCLOPIDÆ.

Cyclops æter and *parvus* (Herr.), *brevispinosus*, sp. n., larger lakes of Minnesota, *oithonoides* (Sars), *thomasi* (Forbes), *insectus* (Forb.), *tenuicornis* (Claus), *modestus* (Herr.), *serrulatus* (Fischer) var. n. *elegans*, *fluvialilis* (Herr.), *phaleratus* (Koch) var. *affinis* (Sars) = *adolescens* (Herr.) = *perarmatus* (Cragin), and *C. fimbriatus* (Fischer), United States of N. America; Herrick, *op. cit.* pp. 144-163, pls. o, figs. 17 & 19, q 2, figs. 10-12, & q 5, r, s, & u, figs. 4-9.

HARPACTICIDÆ.

Longipedia, g. n. Near *Longipedia*; distinguished by the first thoracic segment being distinct, by the coalescence of the two former abdominal segments in the female, by the first antennæ being well developed, 5-jointed and prehensile in the male, by the inner ramus of the second pair of feet, also prehensile in the male, and by two ovisacs. *L. paguri*, sp. n., Island of Sylt, Slesvic, in shells of *Neptunea* and *Buccinum*, inhabited by *Pagurus bernhardus*. W. Müller, Arch. f. Nat. l. pp. 19-22, pl. iii.

Bradya limicola, sp. n., Ocean Springs, Mississippi, Herrick, *op. cit.* p. 181.

Amyone [*Amymone*] and *Laophonte*: undetermined species from the Gulf of Mexico; *id. op. cit.* p. 183.

Canthocamptus tenuicaudis, sp. n., very near *gracilis* (Sars), Alabama, *northumbicus* var. n. *americanus*, Lakes Minnetonka and Calhoun, *illinoisensis* (Forb.), Minneapolis, *minnesotensis*, sp. n., Minnesota; *id. op. cit.* pp. 164-173, pls. o, figs. 1-14 & 20-22, q, figs. 15 & 16, & t, figs. 1-6.

Attheyella (Brady). Critical note; *id. op. cit.* p. 174.

Mesochra liljeborgii (Boeck) and *adriatica*, sp. n., found at Trieste in the open sea; Car, Arch. f. Nat. l. pp. 243 & 244, pl. xvii. figs. 1-4.

Laophonte pilosa, sp. n., Trieste, littoral; *id. t. c.* p. 245, pl. xvii. figs. 5-15.

Thalestris pectinimana, sp. n., Trieste, in open sea; *id. t. c.* p. 248, pl. xviii. figs. 1-8.

Harpacticus chelifera (Müll.) var. n. *arcticus*, North Pacific and Behring's Sea; Poppe, Arch. f. Nat. l. pp. 296-302, pls. xxiii. & xxiv.

? New variety from the Gulf of Mexico; Herrick, *op. cit.* p. 184.

Huxtemannia, g. n. First pair of feet spiny; outer ramus 2-jointed, with two long bristles; inner ramus shorter, 1-jointed, terminating into two spines; first antennæ of the female 5-jointed; mandibular palpus simple, 1-jointed. *H. jadensis*, sp. n., Jade Inlet. Poppe, Abh. Ver. Brem. ix. p. 57.

Idya fuscata (M.-Edw.) = *Tisbe ensifera* (Fischer), Trieste, in the open sea; Car, Arch. f. Nat. l. p. 250, pl. xviii. figs. 9 & 10.

PELTIDIIDÆ.

Scutellidium arthuri, sp. n., Pacific, lat. 55° N., on weed; Poppe, Arch. f. Nat. l. pp. 291-296, pls. xxi. figs. 1-4, & xxii. figs. 1-12.

Zaus aurelii, sp. n., Pacific, lat. 55° N., on weed; Poppe, *t. c.* pp. 286-291, pls. xx. figs. 7-9, & xxi. figs. 5-15.

CORYCÆIDÆ.

Saphirina sp. ? from Trieste; Car, Arch. f. Nat. l. p. 253, pl. xviii. figs. 11-14.

DICHELESTIIDÆ.

Kroeyeria galei-vulgaris, sp. n., Hesse, Ann. Sci. Nat. (6) xvi. p. 2, pl. i. figs. 1-11, on the gills of *Galeus vulgaris*; only the female known.

Eudactylina squatinæ-angeli, sp. n., *id. t. c.* p. 5, pl. ii. figs. 1-13, on the gills of *Squatina angelus*, very agile; female and larva known. *E. musteli-lævis* and *charchariæ* [sic!] *glauci*, spp. nn., *id. t. c.* p. 8, pl. iii. figs. 1-23, on the gills of *Mustelus lævis* and *Carcharias glaucus*; only the female known.

Pagodina carchariæ glauci, sp. n., *id. t. c.* p. 13, pl. i. figs. 12-19, on the gills of *Carcharias glaucus*.

Lernanthropus. 2 spp. nn. by S. Richiardi, Atti Soc. Tosc. p.-v. iv. p. 82.

* *Gastrodelphis*, g. n. *G. clausii*, sp. n., Adriatic. Graeffe, Boll. Soc. Adr. viii. fasc. 1, 1 pl.

CIRRIPEDIA.

BALANIDÆ.

Balanus crenatus (Brug.), base calcareous, below tide-mark; *B. balanoides* (L.), base membranaceous, between tide-marks: Hoek, Schaald. Ooster-Schelde, pp. 3-5.

Acasta sulcata (Lam.) var. from Albany Island; Miers, Zool. Coll. Alert, p. 322.

PELTOGASTRIDÆ.

Y. DELAGE describes the very strange development of *Sacculina carcini* (Thomps.), and proposes to form on account of it for this family a new order, "KENTROGONIDES," distinct from the *Cirripedia* [vide *suprà*, p. 7].

Sacculina panopei, sp. n., on *Panopeus herbstii* (M.-Edw.), Florida: general description; Gissler, Am. Nat. xviii. pp. 225-229, with woodcut.

Spherothylacus, g. n. *S. polycarpus*, sp. n., Indian Sea. Sluiter, Tijdschr. Nederl. Ind. xliii. pp. 201-204, with a plate; also separately.

XIPHOSURA.

The testis of *Limulus* is the subject of a paper by W. B. S. BENHAM; Tr. L. S. (2) ii. pp. 362-366, 1 pl.; abstract in J. R. Micr. Soc. (2) iv. p. 49.

Limulus polyphemus. Note on its moulting; Lockwood, Am. Nat. xviii. p. 200.

ARACHNIDA.*

BY

T. D. GIBSON-CARMICHAEL, M.A., F.L.S.

(FOR 1883 AND 1884.)

1. BARROIS, J. Le développement de *Chelifer*. C.R. xcix. pp. 1082 & 1083.

In the larval condition of *Chelifer* there are five pairs of limbs; all the future limbs exist, but are incompletely developed. There is a suctorial stomach peculiar to the larval stage, which is shed when the creature attains maturity. The nervous system consists of two bands, one in front of and one behind suctorial stomach; when the latter is shed the bands become fused.

2. BECKER, L. Catalogue des Arachnides de Belgique. *Chernetes*. C.R. ent. Belg. (3) No. 49, pp. cclxxxiii. & cclxxxiv.
3. BELL, F. JEFFREY. A Second Note on *Pentastomum polyzonum*. Ann. N. H. (5) xiv. pp. 92 & 93.
4. BENHAM, W. B. S. On the Testis of *Limulus*. Tr. L. S. (2) ii. pp. 363-366.

The structure of the testis, consisting of two lateral and a median network of tubes, gives strong support to the view that *Limulus* is closely allied to the *Arachnida*.

5. BERG, C. Eine fischende Spinne. Kosmos, vii. p. 375. [Una Araña pescadora. An. Soc. Arg. xv. p. 240.]

Diapontia kochii, Keys., spins a web partly in water.

6. BERLESE, A. Acari, Myriopoda, et Scorpiones hucusque in Italia reperti. Fasc. i.-xiv. Padova: 1882-84.

* As it is not long since I began the study of *Arachnida*, I do not feel competent to judge of the value of new species. I have consequently merely given a list of the memoirs published, with, where necessary, a note on their contents, but have not attempted to draw up a list of new species.—REC.

7. [BERLESE, A.] Sopra due nuovi generi di Acari Italiani. Lettura fatta alla R. Accad. di Padova. Padova : 1883, 5 pp., figs.
The new genera are *Histrogaster*, Berl., and *Damaeus*, Koch.
8. —. Acarofauna sicula. 1^a serie. Bull. Ent. Ital. xv. pp. 212-220.
Describes 55 species.
9. —. La sistematica dei Sarcoptidi. *Op. cit.* xvi. pp. 287-292.
— [See also CANESTRINI.]
10. BERTKAU, P. Ueber die Gattung *Argenna*, Thor., und einige andere Dictyniden. Arch. f. Nat. (2) xlix. pp. 374-382, pl. xi.
Describes the respiratory system of *Argenna*, and a new species.
11. —. Ueber den Bau und die Function des sogenannten Leber bei den Spinnen. Arch. mikr. Anat. xxiii. pp. 214-245, pl. xii. [Abstr. in J. R. Mic. Soc. (2) iv. pp. 558 & 559.]
12. —. Ueber den Verdauungsapparat der Spinnen. *Op. cit.* xxiv. pp. 398-451, pls. xx. & xxi.
A full account of the digestive system, chiefly of *Atypus piceus*.
13. —. Anatomy of Spiders. An abstract, in J. R. Mic. Soc. (2) iv. p. 885, of a paper in Verh. Ver. Rheinfl. xli. pp. 66-77, dealing principally with the anatomy of the digestive tract.
— [See also FOERSTER.]
14. BROTHERSTON, A. Animal Parasites. Zoologist (3) vii. pp. 292 & 293.
Notes on *Ixodes*.
15. CAMBRIDGE, O. P. Descriptions of Two New Species of *Walckenaera*, Blackw. Ann. N. H. (5) xiv. pp. 89-92, pl. iv.
16. —. On some New Genera and Species of Spiders. P. Z. S. 1883, pp. 352-365, pls. xxxvi. & xxxvii.
8 new species and 8 new genera—*Sarpedon*, *Atypoides*, *Amaurobioides*, *Cyrillus*, *Castropoda*, *Nesis*, *Phalaphatus*, *Pherecydes*.
17. —. On Two New Genera of Spiders. P. Z. S. 1884, pp. 196-205, pl. xv.
New genera : *Ornithoscatoides* and *Regillus*.
18. —. Pseudoscorpions new to Britain. Naturalist (n.s.) x. p. 103.
19. CAMPBELL, F. M. On the Pairing Organs of *Tegenaria guyonii*, Guér., with a description of certain organs in the abdominal sexual region of the male. J. L. S. xvii. pp. 162-174, pls. vii. & viii. [Abstr. in J. R. Mic. Soc. (2) iii. p. 502.]
20. —. The Spiders of the Neighbourhood of Hoddesdon : a Contribution to the Arachnid Fauna of Hertfordshire. Tr. Hertf. Soc. ii. pp. 263-276.

21. CANESTRINI, G. Acari nuovi o poco noti. I. Acari Italiani (10 sp., 9 new). II. Acari dell' Australia (15 sp., 13 new). [Extr. from *Atti Ist. Venet.* (6) ii., 32 pp., 4 pls.]
22. —, & CANESTRINI, R. I Gamasi Italiani. *Atti Soc. Pad.* viii. pp. 3-82, pls. i.-vii.
9 new species. New genera : *Stilochirus* and *Pacilochirus*.
23. —, & BERLESE, A. Sopra alcune nuove specie di Acari Italiani. *Op. cit.* ix. pp. 175-182, pl.
3 species of *Uropoda* and 2 species of *Belba*.
24. CANESTRINI, R. Osservazioni sulla *Nicoletiella cornuta*. *Atti Soc. Pad.* viii. pp. 133-146, pl. viii.
25. CHILTON, C. On Two Marine Mites. *Tr. N. Z. Inst.* xv. pp. 190-192, figs.
2 new species of *Halacarus*.
26. COSTA, A. Diagnosi di nuovi Artropodi trovati in Sardegna. *Bull. Ent. Ital.* xv. pp. 332-341; also *Atti Acc. Nap.* (2) i.
One new species, *Formicina eleonora*.
27. CSOKOR, J. The Hairsac Mite of the Pig (*Demodex phylloides*). Abstr. by R. Ramsay-Wright in *Am. Nat.* xvii. pp. 1112-1117, fig. (Abstr. of paper in *Verh. z.-b. Wien*, xxix.)
28. DAHL, F. Analytische Bearbeitung des Spinnen Norddeutschlands. *Schr. Ver. Schles.-Holst.* v. pp. 13-86, 2 pls. (Kiel : 1883).
29. —. Ueber die Hörhaare bei den Arachniden. *Zool. Anz.* vi. pp. 267-270, 2 figs.
30. —. Das Gehör und Geruchsorgan der Spinnen. *Arch. mikr. Anat.* xxiv. pp. 1-10, pl. i.a. [Trans. in *Ann. N. H.* (5) xiv. pp. 329-337, pl. Abstr. in *J. R. Micr. Soc.* (2) iv. pp. 886 & 887.]
Dahl wishes to classify Spiders according to the disposition of the auditory hairs on their limbs. These auditory hairs appreciate atmospheric pressure as well as sound. Olfactory organs are also described.
31. —. Beiträge zur Biologie der Spinnen. *Zool. Anz.* vii. pp. 591-595.
Notes on the sight, smell, hearing, and web-making of certain Spiders.
32. EMERTON, J. H. The Cobwebs of *Uloborus*. *Am. J. Sci.* (3) xxv. pp. 203-205, figs.
33. FLEMING, J. Ueber eine geschlechtsreife Form der als *Tarsonemus* beschriebenen Thiere. *Z. Naturw.* lvii. pp. 472-480, pl. ii.
34. FOERSTER, A., & BERTKAU, P. Beiträge zur Kenntniss der Spinnenfauna der Rheinprovinz. *Verh. Ver. Rheinl.* xl. pp. 205-278, pl. iii.
412 species (6 new) are found in the province.

35. FORBES, H. O. On the Habits of *Thomisus decipiens*, a Spider from Sumatra. P. Z. S. 1883, pp. 586-588.

This Spider, a species of *Ornithoscatoidea* [vide CAMBRIDGE, *supra* (17)], mimics the excreta of birds.

36. GARMAN, H. *Pterolichus falciger*, Mègn., observed in the United States. Am. Nat. xviii. pp. 430 & 431, fig.

37. HALLER, G. Beschreibung einiger neuen Milben. Arch. f. Natur. (2) l. pp. 217-236, pls. xv. & xvi.

Describes 10 new species and a new genus (*Michaelia*).

38. HENKING, H. *Trombidium fuliginosum*. Abstr., in J. R. Micr. Soc. (2) iii. pp. 210 & 211, of paper in Z. wiss. Zool. xxxvii. p. v. [Cf. Zool. Rec. xix. *Arachn.* pp. 26 & 27.]

39. HOLMBERG, E. L. Géneros y especies de Arácnidos Argentinos nuevos o poco conocidos. An. Soc. Arg. xv. pp. 232-239.

40. —. *Neothereutes darwini*, g. & sp. nn., representante de una nueva familia de Citigradas. Bol. Ac. Arg. v. pp. 35-48.

41. HOYLE, W. E. On a new species of *Pentastomum* (*P. protelis*) from the mesentery of *Proteles cristatus*; with an account of its anatomy. Tr. R. Soc. Edinb. xxxii. pp. 165-193. (Abstr. in P. R. Soc. Edinb. 1882-83, pp. 219-222.)

Bell [vide *supra* (3)] thinks this an immature form of *P. polyzonum* found in large snakes.

42. JOYEUX-LAFFUÏE, J. Appareil venimeux et venin du Scorpion. Étude anatomique et physiologique. Arch. Z. expér. (2) i. pp. 733-783, pl. xxx. [Abstr. in J. R. Micr. Soc. (2) iv. p. 558.]

43. KARPELLES, L. Ueber eine noch nicht beschriebene *Nothrus*-Art. Arch. f. Nat. (2) xlix. pp. 445-457, fig.

Nothrus kornhuberi, from Japan.

44. —. Beiträge zur Naturgeschichte der Milben. B. E. Z. xxviii. pp. 1-34, figs.

2 new species.

45. —. Neue Milben. T. c. pp. 231-244, figs.

3 new species.

46. —. Ueber Gallmilben (*Phytoptus*, Duj.). SB. Ak. Wien, xc. pp. 46-55, pl.

47. KARSCH, F. Ueber einige neue und minder bekannte Arthropoden des Bremer Museums. Abh. Ver. Brem. ix. pp. 65-71.

Describes *Hoplocystis scintilla*, g. & sp. nn. of Scorpions; *Gasteracantha dahomensis* and *Tortula simoni*, new Spiders from Dahomey and Cochin China.

48. [KARSCH, F.] Ueber die Arachniden-Familie *Sironoidæ*, und über einen neuen *Siro* aus Austrien (*S. macquipa*). B. E. Z. xxviii. pp. 143-146.

49. —. Neue Milben in Bernstein. T. c. pp. 175 & 176.
3 new species.

50. —. Die Katipo-Spinne "Lauulau" (*Lathrodectus scelio*, Thor.). T. c. pp. 341 & 342.

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[MÉGNIN, P.] [See also TROUËSSART.]

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108. —. Note sur la groupe des *Mecicobothria*. *T. c.* pp. 313-317.

3 new species. New genera : *Brachybothrium* and *Hexura*.

109. —. Arachnides nouveaux d'Algérie. *T. c.* pp. 321-327.

7 new species. New genera : *Scotolathys*, *Chorea*, and *Xestaspis*.

110. —. Descriptions de quelques Arachnides des genres *Miltia* et *Zimiris*. C.R. ent. Belg. (3) pp. cxxxix.-cxlii.

111. —. Note sur le groupe des *Dioleni* (famille des *Attidæ*), et descriptions d'espèces nouvelles. *T. c.* pp. ccxv.-ccxxx.

6 new species. New genera : *Lystrocteis* and *Chalcolecta*.

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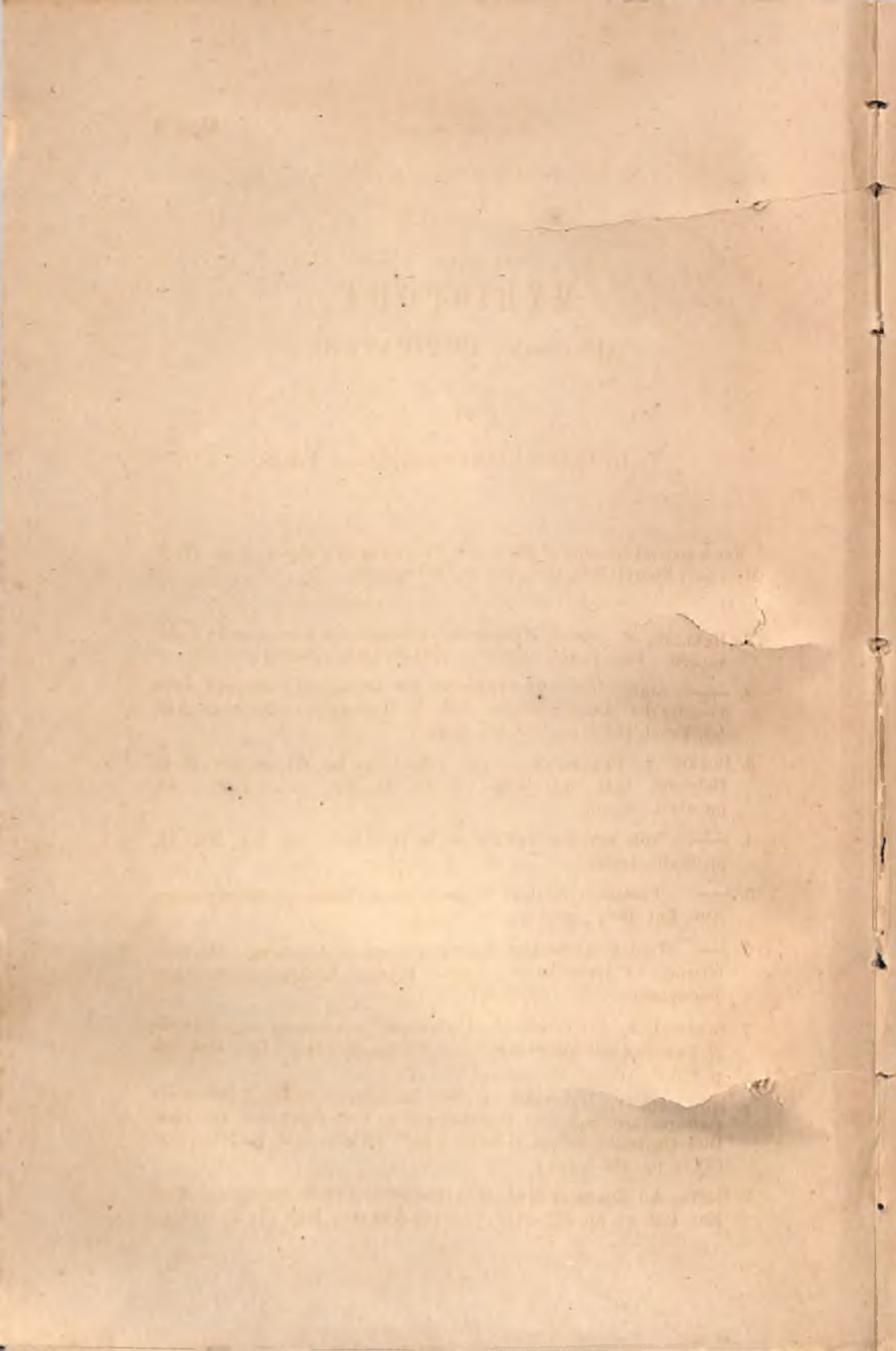
4 new species. New genera : *Bradystichus* and *Borboropactus*.

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MYRIOPODA

(INCLUDING PERIPATUS).

BY

T. D. GIBSON-CARMICHAEL, M.A., F.L.S.

For a general account of the Group (inclusive of *Peripatus*), see H. N. MOSELEY, Encycl. Brit. xvii., *sub voce* Myriopoda.

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NEW GENERA.

Brachypauropus, Latzel (20).

Rhiscosoma, Latzel (20).

Trichiulus, Scudder (29), fossil.

NEW SPECIES.

Scolopendra annulipes, Lucas (23).

Scolopocryptops confucii, Karsch (18), from China.

Geophilus crassicauda, Costa (9), from Sardinia.

Eurypauropus ornatus, *E. cycliger*, Latzel (21).

Trachypauropus margaritaceus, Tömösváry (32).

Glomeris lunato signata, Costa (9); *G. minima*, *G. tyrolensis*, *G. tridentina*, Latzel (20).

Brachydesmus filiformis, *B. superus*, *B. dalmaticus*, *B. inferus*, *Polydesmus tridentinus*, *P. novicus*, *P. falcifer*, *P. subscabratus*, *P. rangifer*, *P. polonicus*, *Rhiscosoma alpestre*, *Craspedosoma oribates*, *C. stygium*, *C. moniliforme*, *C. mutabile*, *C. crementatum*, *C. flavescens*, *C. troglodytes*, *Lysioptalum degenerans*, *L. illyricum*, *L. anceps*, *L. cognatum*; Latzel (20).

Julus belgicus, Latzel (22); *J. incertus*, *J. latzelii*, Berlese (2); *J. pilosotus*, *J. nanus*, *J. pelidnus*, *J. decentrus*, *J. imbecillus*, *J. platyrurus*, *J. podabres*, *J. montivagus*, *J. mediterraneus*, *J. caltarensis*, Latzel (20).

Trichiulus villosus, *nodulosus*, and *ammonitiformis*, Scudder (29), fossil.

ANATOMY.

Bütschli (8) and Sazepin (28) have studied the nerve-terminations on the antennæ of various *Chilognatha*. They find that the sensory

structure is essentially the same as that found by Hauser in *Vespa*, but that it really consists of a great number of cells, not, as he thought, of a single cell.

The respiratory organs of *Scutigera* have been described by Tömösváry (33); those of the *Symphyla* and the *Chilopoda*, by Haase (15).

Tömösváry (34) describes the peculiar sense organs found in *Lithobius*, *Polyxenus*, *Pauropus*, *Glomeris*, and *Scutigera*, which he fancies may be of use in determining the meteorological conditions of the animal's surroundings.

Bolles-Lee (7) and Passerini (25 and 26) discuss the minute structure of the integument in 7 genera of Myriopods.

Meinert (24) makes some remarks on the anatomy of the mouth-parts in *Scolopendra*, and Haase (16) on those of *Scutigera*.

Fanzago (11) describes the "nest" of a species of *Geophilus*, which looks like a hollow ball of earth with a lens-shaped aperture; he also (12) describes a somewhat similar structure formed from earth by a species of *Scolopendra*. In both these cases it seems as if the earth had been stuck together by some viscous fluid. Such a fluid, Dewitz (10) has found exuding from the foramina repugnatoria of *Glomeris*. Dewitz thinks this fluid may be useful in stopping the animal from rolling far if it loses its foothold; but it seems more probable that it is used in forming a nest.

Kennel (19) describes more fully the development of *Peripatus*, as referred to in Zool. Rec. xx. *Myr.* p. 3.

Berlese (1 and 2), Borre (5 and 6), Karsch (17), and Latzel (20), contribute largely to our knowledge of synonymy.

DISTRIBUTION.

Berlese (1 and 2) describes Myriopods from Italy, including 2 new species; Costa (9), 2 new species from Sardinia.

Borre (3 and 4) gives lists of Belgian *Glomeridæ* and *Julidæ*. Latzel (22) describes a new species from Belgium.

Gadeau de Kerville (13) gives a list of Myriopods from Normandy, including new species.

Latzel (20 and 21) describes the *Symphyla*, *Pauropoda*, and *Diplopoda* of the Austro-Hungarian Empire; many new species.

Seliwanoff (30) gives a list of Russian *Myriopoda*.

Plateau (27) mentions 4 species as found in Spain.

Karsch (18) describes a new species found in China.

Shufeldt (31) mentions *Cermatia forceps* as found near New Orleans, U.S.

Scudder (29) finds that amongst ancient Myriopod forms divergencies of structure were as great as amongst recent forms; and that the dermal appendages were of a complex organization.

INSECTA.

THE GENERAL SUBJECT.

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

* AURIVILLIUS, C. Föredrag i zoologi vid Kongl. Vetenskapsakademiens högtids-dag den 31 Mars 1883. Stockholm: 1883, 8vo, pp. 18. Innehåller 1. Om galläplesteklarve. 2. Om insekternas sinnesorgan.

* AVELING, E. B. Insects and Flowers. "Our Corner," iii. [*Cf.* J. Sci. (3) vi. p. 241.]

BRANNER, J. C. Preliminary Report of Observations upon Insects injurious to Cotton, Orange, and Sugar-cane in Brazil. Bull. Dep. Agric. Ent. iv. pp. 61-69.

BREITENBACH, W. Ueber die Fortbewegung der Tiere an senkrechten glatten Flächen. Kosmos, xv. pp. 65-68.

BÜTSCHLI, O. Ueber die nervösen Endorgane an den Fühlern der Chilognathen und ihre Beziehungen zu denen gewisser Insekten. Biol. Centralbl. iv. pp. 113-116, figs. 1 & 2.

According to unpublished observations of Sacepine on various *Chilopoda* and on *Vespa crabro*, the former possess antennal structures perfectly analogous to the supposed olfactory organs of Insects.

CHAMPION, G. C. Tropical Collecting. Ent. M. M. xx. pp. 172-175, 199-205, & 248-250.

CHATIN, J. Sur le sous-maxillaire, le maxillaire, le palpigère, le sous-galéa et les appendices de la machoire chez les Insectes broyeur. C.R. xcix. pp. 51-53, 285-288, & 939-942; *cf.* also Ann. N. H. (5) xiv. pp. 147-149.

A rather important series of papers, describing the structure of the *Dytiscidae* of the mouth in mandibulate Insects.

* *Thos.* *Thos.* the Methodic Habits of Insects when visiting and man's. *Thos.* xvii. pp. 81-86.

* *Thos.* of the author's previous papers.

* HOLM, J. Practical Entomology. Notes from the Entomological Laboratory of the Michigan Agricultural College. 1884 (?): 8vo, woodcuts.

JONES, *Thos.* enumerated will be noticed in their places. About half Randoet is written by C. M. Weed. The title of the pamphlet on

the fly-leaf is, "Notes on Injurious Insects." It is here quoted as "Cook's Pract. Ent."

COSTA, A. Notizie ed osservazioni sulla Geo-Fauna Sarda. Memorie terza e quarta. . Rend. Acc. Nap. xxiii. pp. 80, 81, & 167-174.

Notes on collecting in September, 1881, and in the spring of 1882, with descriptions of new species of various Orders.

DAHL, F. Beiträge zur Kenntniss des Baues und der Funktionen der Insektenbeine. Arch. f. Nat. l. pp. 146-193, pla. xi.-xiii. (also sep., Inaug. Diss., Berlin, 1884; and preliminary notice, Zool. Anz. vii. pp. 38-41. Cf. also An. Nat. xviii. p. 1046.)

The external and internal structure of insect-legs in general is briefly described, and a table is given of the structure of the prehensile appendages of the various parts. The use of the legs for movement, climbing, predatory, or cleansing purposes, is also discussed.

ELLISON, S. T. How an Insect Flies. P. Perthshire Soc. i. pp. 158-163, plate.

. A popular article, chiefly based on Pettigrew's "Animal Locomotion."

EMERY, C. Fortbewegung von Tieren an senkrechten und überhängenden glatten Flächen. Biol. Centralbl. iv. pp. 438-443.

Relates to recent observations of Dewitz, Rombois, Dahl, and Siemermacher on Insects, &c.

FORBES, S. A. Insects injurious to the Strawberry. Rep. Ins. Illin. xiii. pp. 63-183.

44 species of insects, &c., are enumerated in this paper, viz., *Hymenoptera* (4), *Lepidoptera* (13), *Diptera* (1), *Coleoptera* (14), *Orthoptera* (2), *Hemiptera* (8), *Myriopoda* (1), and *Arachnida* (1). Many of these are figured as well as described; but the paper is in great part a compilation, and only a few species will require notice in the special part of Zool. Rec.

FROMHOLZ, C. Kleine Studien über das Wahrnehmungs- und Gefühlsvermögen der Insecten. B. E. Z. xxviii. pp. 113-120.

The writer discusses various observations (partly original), which lead him to the conclusion that Insects are well fitted to take cognizance of heat and cold, the density or rarity of the atmosphere, the approach of enemies, &c.; but possess little or no susceptibility to pain. A summary of what is known relative to the senses of Insects is given in a note.

FYLES, T. W. Observations on Form and Colour of Insects. Rep. E. Soc. Ont. 1883, pp. 62-65.

A popular article, of a very general character.

* GADEAU DE KERVILLE. Mélanges entomologiques. i. (1884), Rouen. (Apparently reprinted from Bull. Soc. R. Wien. ent. Z. iv. p. 31.)

The contents are given in Ent. Nachr. x. p. 377, and will be found in their places.

GIRAUD, P. Les parasites extérieurs de l'homme. Le Nat. vi. pp. 558, 559, 565, & 566.

A semi-popular article (not completed in 1884) relating to *Diptera*, *Hemiptera*, and *Aphaniptera*.

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. xxviii.-xxxiv.

The portion published in 1884 includes the following sections relating to Entomology:—

Coleoptera, i. (1), by H. W. Bates, pp. i.-x. & 257-316, pl. xiii.

Coleoptera, i. (2), by D. Sharp, pp. 313-392, pls. viii. & ix.

Coleoptera, iii. (2), by H. S. Gorham, pp. 225-272, pl. xi.

Coleoptera, iv. (1), by G. C. Champion, pp. 1-88, pls. i.-iii.

Coleoptera, v., by H. W. Bates, pp. 225-248, pl. xvi.

Coleoptera, vi. (1), by M. Jacoby, pp. 265-336, pls. xvi.-xix.

Hymenoptera, by P. Cameron, pp. 81-144, pls. v.-vii.

Lepidoptera Rhopalocera, by F. D. Godman & O. Salvin, pp. 289-360, pls. xxviii.-xxxvii.

Lepidoptera Heterocera, by H. Druce, pp. 33-112, pls. vi.-xi.

Rhynchota Heteroptera, by W. L. Distant, pp. 265-314, pls. xxiv.-xxviii.

GRABER, V. Ueber die Mechanik des Insektenkörpers i. Mechanik der Beine. Biol. Centralbl. iv. pp. 560-570.

Discusses recent observations of Dahl, Tuffen-West, Rombouts, Dewitz, and Simmermacher.

HAGEN, H. A. The first numero [*sic*] of Thomas Say's "American Entomology," and two letters on the Hessian Fly, hitherto not mentioned among his published papers. Psyche, iv. pp. 145 & 146.

Chiefly of bibliographical interest.

HARRINGTON, W. H. Entomology for Beginners. Notes of a June ramble. Canad. Ent. xvi. pp. 101-103.

* HESS, W. Die Hausgenossen des Menschen unter den Gliederthieren. Hanover: 1884, 8vo, pp. 99, and 19 figs. (*Cf.* Zool. Gart. xxv. p. 159.)

HOFMANN, E. Der Fischzucht schädliche und nützliche Thiere. JH. Ver. Württ. xl. pp. 36-40.

The most injurious *Arthropoda* which destroy fish or their ova are *Dytiscidae*, *Hydrophilidae*, *Libellulidae*, *Notonectidae*, and parasitic *Crustacea*. Those which serve as food are *Diptera*, *Trichoptera*, *Ephemeroidea*, and many small Insects and *Crustacea*.

* HOLMGREN, A. E. Trädgårdens skadedjur. Handbok för landbrukare och trädgårdslare. i. Insekter. Tredje häftet. Stockholm: 1883, 8vo, pp. 155-354.

JONES, E. D. In the Tropics. Naturalist (2) ix. pp. 125-134.
Random notes (some important) on Insects observed in Brazil.

KARSCH, A. Die Insektenwelt. Ein Taschenbuch zu entomologischen Exkursionen für Lehrer und Lernende. 2te vermehrte und verbesserte, mit 389 Abbildungen in Holzschnitt... bereicherte Auflage. Leipzig: 1883, 12mo, pp. cxliv. & 702. (*Cf.* Ent. Nachr. x. pp. 329-331, and Wien. ent. Z. iv. pp. 60 & 61.)

Consists of analytical tables of the German families and genera of all Orders of Insects, and a brief synopsis of species.

KIEFFER, J. J. Contributions à la faune et à la flore de Bitché. Bull. Soc. Metz (2) xvi. pp. 35-111.

Includes lists of Insects of all Orders, by various specialists.

* KLENKER, F. Ueber endoskeletale Bildungen bei Insekten. Göttingen: 1883, 8vo, pp. 53.

KOLBE, H. J. Die Vorläufer (Prototypen) der höheren Insectenordnungen im paläozoischen Zeitalter. Eine kurze Betrachtung. B. E. Z. xxviii. pp. 167-170.

A general article, apparently a compilation.

— Vorläufige Mittheilung über ein neues, dem Gange der Naturschöpfung entlehntes System der *Trichoptera*, nebst einen Hinweis auf die vermuthliche Abstammung der *Lepidoptera*. *T. c.* p. 180.

The writer considers the *Lepidoptera* to have originated from the *Lepidoceridae*.

— Entomologie: Ein Blick vor- und rückwärts. *T. c.* pp. 388-390.

A short notice of the present state of the science.

— Entomologisch-kosmologische Betrachtungen. *T. c.* pp. 391-393.

Includes remarks on differentiation in] the course of metamorphosis, persistency of character, impulse to modification, origin of varieties, races and species, geological age of species, and various observations on *Coleoptera* and *Odonata*.

KORSCHÉLY, E. Ueber die Bildung des Chorions und der Micropylen bei den Insecteneiern. Zool. Anz. vii. pp. 394-398 & 420-425, figs.

* KRUKENBERG, C. F. W. Grundzüge einer vergleichenden Physiologie der Farbstoffe und der Farben. Vergl. phys. Vorträge, iii. 102 pp. (*Cf.* Ent. Nachr. x. pp. 291-296.)

Discusses the nature of the colouring matter of animals (including Insects) and plants.

* LICHTENSTEIN, J. Tableau synoptique et catalogue raisonné des maladies de la vigne. Montpellier: 1884, pp. 20. (*Cf.* Ent. Nachr. x. pp. 251 & 252.)

Chiefly relates to Insect attacks.

LOWNE, B. T. On the Compound Vision and the Morphology of the Eye in Insects. Tr. L. S. (2) ii. pp. 389-420, pls. xl.-xliii.

After a sketch of the opinions of previous authors, Lowne proceeds: "The compound eye is divided into two parts by a membrane which I

shall speak of as the *membrana basilaris*. The structures between this membrane and the cornea are the crystalline cones and the great rods. I regard all these as dioptric structures, and shall speak of the cornea, and all the parts which intervene between it and the *membrana basilaris*, as the *Dioptron*. I shall use the term *great rod* provisionally to designate the complex structure between each cone and the *membrana basilaris*, and *segment of the dioptron* for the parts, collectively, beneath each corneal lens. Beneath the *membrana basilaris* I have discovered a layer of bacilla, comparable in most respects with the rod and cone layer of the vertebrate, in the place where Gottsche suggested such a structure might exist. This layer is succeeded by others, similar to the nuclear and molecular layers of the vertebrate eye. I shall speak of all these structures as the *Neuron*. The existence of a continuous basilar membrane, in some Arthropods at least, excludes the great rods from any share in the nervous mechanism." He then suggests "the possibility that the spindles of the great rods should be regarded as lenses of very short focal lengths, but of great thickness, and that they form a second refractive system, the anterior foci of which correspond with the subcorneal images, and the posterior foci with the bacillar layer of the retina. . . . The anterior reflective system of each segment of the dioptron consists of a corneal facet, a lenticulus . . . , and the anterior face of the crystalline cone. These parts form a *subcorneal image*, which lies in the anterior focus of the posterior refractive system. The posterior refractive system magnifies the subcorneal image, and erects it, at its posterior focal plane, upon the bacilla of the neuron. . . . The simple eyes of many larval Insects have a posterior refractive system, and afford a complete transition from a simple to a compound eye." The author then proceeds to describe the anatomy and functions of the Dioptron and Neuron, after which he discusses the development of the compound eye, and the morphology of the eyes of Arthropods. For the provisional classification, proposed for various modifications of Arthropod eyes, the paper itself must be consulted. The author concludes with the remark, "It would appear therefore that the compound eye is to be regarded as a collection of *compound ocelli*, in which the tendency to close union is greater nearer to the surface than in its deeper portion, the optic nerves being the last parts to become fused into a single compound structure."

MACFARLANE, J. M. On the Distribution of Honey-Glands in Pitchered Insectivorous Plants. *Nature*, xxxi. pp. 171 & 172.

MACLEAY, W. The Insects of the Maclay Coast, New Guinea. *P. Linn. Soc. N. S. W.* ix. pp. 700-712.

Notes on a small collection formed by Baron Maclay at Astrolabe Bay. About 50 species of various Orders are enumerated, several being described as new.

MACLOSKIE, G. The Structure of the Tracheæ of Insects. *Am. Nat.* xviii. pp. 567-573, figs. 1-4.

Reviews the opinions of previous authors, and discusses the pseudotracheæ of *Muscidæ*, the wall of the tracheæ (in *Myriopoda*, &c.), and

the mode of aëration. The author sums up his remarks as follows:—
 "The tracheæ of Insects and similar organs are supported by chitinous fibres which are crenulations accompanied by thickening of the chitinous intima with which they remain continuous; their dorsal fissure and flexibility providing for the enlargement and reduction of the cavity; and the oxygenation of the tissues has its seat chiefly at the extremity of the tracheal branches, and not by diffusion from the tracheal trunks into the blood."

[MACLOSIE, G.] Gills of Insect Larvæ. *Psyche*, iv. pp. 110–112.

The action of the tracheæ is tidal rather than by peripheral capillary circulation, and therefore the endings of the ramifications are found to harmonize with their internal terminations along the nervous and digestive tracts, and in other parts of the tissues which they supply.

MANN, B. P. The Bibliography of Entomology. Annual Address of the retiring President of the Cambridge Entomological Club in January, 1884. *Psyche*, iv. pp. 155–159.

MARSEUL, S. A. DE. Les Entomologistes et leurs écrits (suite). *L'Ab.* xx. pp. 97–144.

Bibliographical lists of the writings of Guérin Ménéville, Rambur, Putzeys, Andrew Murray, Suffrian, Giraud, Germar, Fischer de Waldheim, G. A. Olivier, J. E. & J. L. Le Conte, Schöenherr, Ménétries, Faldermann, and Boheman.

* MEINERT, F. Om Sammensætningen af Hovedet och Tydningen af Mundelene hos Insekterne samt om Insekternes Systematik. Förh. vid 12^{te} Skand. Naturforskerkongressen i Stockholm, 1880, Stockholm, 1883, pp. 510–513.

MÜLLER, H. Die Stellung der Honigbienen in der Blumenwelt. **Deutsche Bienenzeitung*, 1882 & 1883; *Bot. Centralbl.* xii. [1882] pp. 190–192, xviii. pp. 294–296.

Relates to the visits of various insects (not exclusively bees) to flowers.

ORMEROD, E. A. Guide to Methods of Insect Life, and prevention and remedy of Insect ravage; being ten lectures delivered for the Institute of Agriculture, December, 1883. London: 1884, 8vo, pp. viii. & 167, woodcuts. [*Cf. Gard. Chron.* (2) xxi. p. 179.]

A popular introduction to British Entomology, written from a practical point of view, and very fully illustrated.

— Report of Observations of Injurious Insects and Common Crop Pests during the year 1883, with methods of prevention and remedy. London: 1884, 8vo, pp. vi. & C., and App. pp. 16, woodcuts.

Relates to Insects of various Orders injurious to apple, beans, cabbage, carrot, celery, cherry, corn and grass, gooseberry, hop, mangold, onions, parsnips, pear, peas, pine, poplar, raspberry, strawberry, and turnip. The separately-paged appendix relates to *Aphis* (*Phorodon*) *humuli*, Schrank.

PACKARD, A. S. Aspects of the Body in Vertebrates and Arthropods. Am. Nat. xviii. pp. 855-861, woodcuts; Ann. N. H. (5) xiv. pp. 243-249, woodcuts.

The author discusses and brings evidence against the homologies lately urged by Sir R. Owen, and concludes that there is little real analogy between the internal structure of Arthropods and Vertebrates.

PALMEN, J. A. Über paarige Ausführungsgänge der geschlechtsorgane bei Insecten. Eine morphologische Untersuchung. Helsingfors: 1884, 8vo, pp. 108, pls. v. (Cf. Wien. ent. Z. iii. p. 151.)

The author's observations relate to *Ephemeride* (q. v.). A preliminary notice of his investigations appeared in Morph. JB. ix., and was noticed in Zool. Rec. xx. *Ins.* pp. 9 & 262.

PANCRITIUS, P. Notiz über Flügelentwicklung bei den Insecten. Zool. Anz. vii. pp. 370-373.

Describes the gradual development of the wings in the larva of *Smerinthus populi*, Linn., and refers to that of *Myrmeleon* and *Cimbea*.

POUJADE, G. A. Note sur les attitudes des Insectes pendant le vol. Ann. Soc. Ent. Fr. (6) iv. pp. 197-200, pl. viii.

Four-winged Insects (exclusive of *Coloptera*) may be divided into two categories. In one, the two pairs of wings act simultaneously, though separated (as in the bulk of the *Orthoptera* and *Neuroptera*), and in the other they act as one pair only, being united by small hooks, a frenulum, or by overlapping, with or without a longitudinal fold. The position and action of the wings in flight (and sometimes also at rest) is discussed in more or less detail as regards the *Hemiptera*, *Lucanide* and other *Coleoptera*, *Ammophila*, and *Bibio*. The writer cannot positively assign any function to the legs in respect to flight. The plate represents the base of the wings in *Callimorpha hera*, Linn. (with frenulum), and the attitudes of *Calopteryx virgo*, *Locusta viridissima*, Linn., *Pentatoma nigricornis*, Fabr., *Culex annulatus*, Schrank, *Rhyssa clavata*, Fabr., *Tipula oleracea*, *Ammophila sabulosa*, *Bibio marci*, Linn., *Ateuchus semipunctatus*, Fabr., and *Acilius sulcatus*, Linn.

POULTON, E. B. Notes upon, or suggested by, the Colours, Markings, and Protective Attitudes of certain Lepidopterous Larvæ and Pupæ, and of a phytophagous hymenopterous larva. Tr. E. Soc. 1884, pp. 27-60, pl. i.

An important physiological paper, treating of the following subjects:—

The markings of some larvæ of the genera Smerinthus and Sphinx.—The red spots which sometimes occur in *Smerinthus* larvæ have nothing to do with coloured borders to the oblique stripes, and are perhaps a declining character, and of doubtful utility. The white stripes in *Smerinthus* appear to have originated as enlargements of the shagreen dots; and the dorsal line represents the midrib of a leaf. The remains of the subdorsal in the last stage of *Smerinthus* are co-ordinated to the oblique stripes. The subdorsal, as pointed out by Weismann, has comparatively recently been displaced by the oblique lines in *Smerinthus*. The ground colour in *S. ocellatus*, Linn., as suggested by Meldola, is

probably phylogenetic. Protective resemblance is gained by the changes in colour before pupation. *Sphinx* is probably a later development than *Smerinthus*. Various points relating to the larva of *S. ligustri*, Linn., are noticed.

Protective attitudes in the larvæ of Geometræ.—This section relates chiefly to species of *Ephyra*.

The protective attitude of Notodonta ziczac, Linn., as an instance of simulated angularity.—The markings on the larva are so arranged as to give the effect of angular zigzags to perfectly round and even bends.

Notes upon the use and nature of the markings of a Nematus larva (Tenthredinida).—The larva of *N. curtispina*, Thoms., attaches itself to the edge of a saw leaf where it has been eaten away, thus forming an artificial edge; and its colour and markings so assimilate it to the leaf that the protective resemblance is complete, whether viewed from above or from the side. The colouring of this larva is due to the internal organs.

Two kinds of protection by resemblance to surroundings, special and general.

The significance of larval (and pupal) dimorphism.—It is probable that there are several explanations for as many forms of dimorphism.

Phyletic parallelism in metamorphic species.

REITTER, E. Einfaches Mittel, um langbehaarte, in Spiritus verdorbene Insecten, besonders Coleopteren, wieder in ihrer ursprünglichen Schönheit herzustellen. Wien. ent. Z. iii. pp. 79 & 80; Bull. Soc. Ent. Fr. (6) iv. pp. cx. & cxi.

REUTER, O. M. Entomologiska Meddelanden från Societas pro Fauna et Flora Fennica sammanträden åren 1882 och 1883. Ent. Tidskr. v. pp. 163-171.

Short notices on Insects of all Orders.

* —. Om bastard bildning bland insekterna. Förh. vid. 12^{te} Skand. Naturforskäremötet i Stockholm, 1880, Stockholm, 1883, pp. 543-547.

RILEY, C. V. Agriculture, ch. ix. Insects in relation to Agriculture. Encycl. Am. i. pp. 135-142, woodcuts.

Treats of the importance of Economic Entomology; and the principal American Insects injurious to fruit and fruit trees, garden vegetables, and live stock; and concludes with a bibliography.

—. Department of Agriculture. Bureau of Entomology. Catalogue of the Exhibit of Economic Entomology at the World's Industrial and Cotton Centennial Exposition, New Orleans, 1884-85. Washington: 1884, 8vo, 95 pp.

Includes five sections, as follows:—Insects injurious to agriculture, arranged according to plants; insecticides; machinery and contrivances for destroying Insects; bee-culture; and silk-culture.

—. Reports of Observations and Experiments in the Practical Work of the Division [of Entomology] made under the direction of the Entomologist, together with extracts from correspondence on miscellaneous Insects. Bull. Dep. Agric. Ent. iv. 102 pp.

Includes introduction; report on cranberry and hop insects;

observations on the Rocky Mountain locust and other insects in the North-West, during the summer of 1883; preliminary report of observations upon insects injurious to cotton, orange, and sugar-cane in Brazil; report on the effects of cold on the scale insects of the orange in Florida; extracts from correspondence; and additional notes on the cultivation of *Pyrethrum* in the United States. [Only the more important and named Insects mentioned will be noted in the special part of Zool. Rec.]

[RILEY, C. V.] General Truths in Applied Entomology. Tr. Georgia State Agric. Soc. 1884, pp. 153-159 (sep. copy).

The author estimates the number of described species of Insects at 350,000, but he probably includes all *Arthropoda* under this term.

SAUNDERS, W. Insects affecting Forest Trees. Rep. Fruit-Grower's Ass. Ont. 1882, pp. 268-282.

After a few general introductory remarks, the writer popularly describes and figures various species, which will be noticed in their places.

— Insects injurious to the White Pine (*Pinus strobus*). *Op. cit.* 1883, pp. 322-329; Rep. E. Soc. Ont. 1883, pp. 52-59, figs. 19-29.

Relates to the most injurious species of *Coleoptera*, *Hymenoptera*, *Hymenoptera*, and *Lepidoptera*, but more than 100 species of Insects are known to infest this tree.

SCHILDE, J. Entomologische Erinnerungen gegen die Entwicklungshypothese der Darwinianer. S. E. Z. xlv. pp. 228-238 & 321-345.

— Antidarwinistische Skizzen. Deutsche E. Z. xxviii. pp. 123-155.

Relates to *Lepidoptera*, gall insects, &c., and is intended to combat the views of Darwin, Weismann, and others.

— Selektionskritische Seitenblicke ins Insektenleben auf nordischen Mooren. Ent. Nachr. x. pp. 3-9.

Observations on various Insects observed in Finland.

SCHNEIDER, A. Ueber die Anlage der Geschlechtsorgane und die Metamorphose des Herzens bei den Insecten. Schneider's Zool. Beitr. i. pp. 140-143, pl. xx.

Relates to the larvæ of *Chironomus*, *Corethra*, and *Cynips*.

SCHUCH, G. Ueber die Gruppierung der Insekten. MT. schw. ent. Ges. vii. pp. 34-36. (*Cf.* Kosmos, xv. p. 238.)

The writer proposes to classify the Orders of Insects by the structure of the thorax. In the higher Orders, the segments of the thorax are closely united and form the greatest contrast to those of the abdomen; while in the lower Orders, the thoracic segments are less closely united. On this principle he arranges the Orders as follows:—Lower Insects: *Schizothoraca* (*Aptera*, *Orthoptera*, *Dictyoptera* [*Pseudoneuroptera*] *Neuroptera*, *Coleoptera*, *Rhynchota*). Higher Insects: *Zygothoraca* (*Hymenoptera*, *Diptera*, *Lepidoptera*). A diagram is added, showing the origin of Insects from the *Crustacea* and *Archiptera* (?), and their subsequent divergence.

* SCHÖYEN, W. M. Ueber das Vorkommen von Insekten im menschlichen Körper. *Naturen*, viii. pp. 74-77 & 85-87. (Cf. Seler, *Biol. Centralbl.* iv. pp. 475-477.)

Relates to various *Diptera* and *Myriopoda*; *Forficula auricularia*; *Aglossa pinguinalis*, &c.

SCUDDER, S. H. Triassic Insects from the Rocky Mountains. *Am. J. Sci.* (3) xxviii. pp. 199-203; *Ann. N. H.* (5) xiv. pp. 254-259. [See *Blattidæ*.]

SIMMERMACHER, G. Untersuchungen über Haftapparate an Tarsalgliedern von Insekten. *Zool. Anz.* vii. pp. 225-238; *Z. wiss. Zool.* xl. pp. 481-556, pls. xxv.-xxvii.

The first portion of this paper treats of these appendages as secondary sexual characters. As such, they exist only in the *Dytiscidæ*, *Carabidæ*, *Cicindelidæ*, *Silphidæ*, *Meloidæ*, and *Hydrophilidæ*. The writer subsequently discusses their structure in several families of *Coleoptera*, as well as in other Insects, where they serve for climbing purposes, and reviews the opinions of previous authors relative to their mode of action.

SLATER, J. W. Insect Preferences. *J. Sci.* (3) vi. pp. 527-530.

Observations on the apparently capricious choice of food, &c., by Insects.

* SPARRE-SCHNEIDER, J. Insekter anvendte som Menneskeføde. *Naturen*, Christiania, 1883, pp. 163-166, fig.

SYLVESTER, F. W. Report on Insects observed in Hertfordshire during the year 1883. *Tr. Hertf. Soc.* iii. pp. 91-94.

Relates to *Pieris brassicae* and *rapæ*, *Mamestra brassicae*, *Tephritis onopordinis*, *Tipula oleracea*, *Phyllotreta undulata*, *Anthomyia* various species, and *Galleria cereana*.

* TARGIONI-TOZZETTI, A. Relazione intorno ai lavori della R. Stazione di Entomologia agraria di Firenze per gli anni 1879-1882. *Annali di Agricoltura*, pubblicati dal Ministero di Agric. Ind. e Comm. Firenze and Roma: 1884 (pp. xiv. & 645).

* THOMAS, F. Referat über die Literatur der "durch Thiere erzeugten Pflanzengallen." *Bot. JB.* viii. pp. 708-744. (Cf. Löw, *Wien. ent. Z.* iii. p. 22.)

WEED, C. M. The Food Relations of Birds, Frogs, and Toads. *Cook's Pract. Ent.* pp. 20-29.

WESTHOFF, F. Neue Entomococcidien aus Westfalen. *JB. westf. Ver.* xii. pp. 62-66.

Relates to various gall-insects (*Aphidæ*, *Diptera*, *Lepidoptera*, and *Hymenoptera*), with additional observations on species not found in former papers.

WILL, L. Ueber die Entstehung des Dotters und der Epithelzellen bei den Amphibien und Insecten. *Zool. Anz.* vii. pp. 272-276 & 288-291.

The author's observations lead him to the conclusion that the egg cannot be regarded as originally a cell, but as a product.

WOOD, T. Our Insect Allies. London: 1884, 12mo, pp. 238, woodcuts.
(*Cf.* Nature, xxx. p. 382; Ent. M. M. xxi. pp. 140 & 141.)

A popular work, treating of Burying Beetles, the Blow-Fly, the Flesh-Fly, Dor-Beetles, Scavengers of the Water, Blight, Predaceous Insects, Wood-boring Beetles, the Glow-Worm, *Drilus*, &c.

WOOD-MASON, J. Report on the Tea-mite and the Tea-bug of Assam.
London: 1884, 8vo, pp. 20, 3 col. pls.

Relates to the life-history and ravages of *Tetranychus bioculatus*, W.-M., and *Helopeltis theivora*, Moore (? = *H. antonii*, Sign.).

GENERAL NOTES.

E. A. Butler has published a series of popular articles on "The Entomology of a Pond"; Knowledge, v. & vi.

Elementary papers on Insects; Rev. Lapok, i. pp. 4-8, 25-29, 49-53, 65-69, 89-93, & 113-118, figs.

Various observations on Insects (chiefly compiled); Fletcher, Tr. Ottawa Nat. Club, i. (2) [1882] pp. 9-21.

Influence of civilization upon Insects; Norris, Ent. xvii. pp. 187 & 188.

Supposed connection between Insects and epidemics discussed; Cornu, Bull. Insect. Agric. ix. pp. 145-147.

Relation between Birds and Insects: Naturalist (2) ix. pp. 102, 103, 119, 120, & 137; Ent. xvii. pp. 95 & 96.

Note on Insects (chiefly *Coleoptera*) eaten by toads; Hanham, Canad. Ent. xvi. pp. 98 & 99.

Swarm of "small butterflies" observed in the Commune d'Aubigné; but supposed by Desmarest to have been *Palængenia virgo*: Bull. Soc. Ent. Fr. (6) iii. pp. cvii. & cviii.

Calcareous heliciform cases on *Eucalyptus*, the work of an undetermined insect; Wilkinson & Ratte, P. Linn. Soc. N. S. W. ix. pp. 508 & 682.

Notes on Insects in amber: Lucas, Bull. Soc. Ent. Fr. (6) iv. p. ciii.; Helm, Schr. Ges. Danz. (2) vi. p. 130.

On Insects in gum copal; Canad. Ent. xvi. pp. 181 & 182.

Hyperparasitism. A Coleopterous larva destroyed by a Hymenopterous one, and this latter by a Coleopterous one, which is itself destroyed by another Hymenopterous one; Lugger, *Sci. Rec. ii. p. 232 (*cf.* Psyche, iv. p. 211).

Notes on mimicry; Pryer, Butler, & Waterhouse, P. E. Soc. 1884, pp. xxxiii. & xxxiv.

The mathematics of Insect mimicry; Blakiston & Alexander, Nature, xxix. pp. 405 & 406.

Asa Gray has contributed a series of articles on the fertilization of flowers by Insects to the *American Agriculturist (*cf.* Psyche, iv. p. 136).

On the fertilization of *Pedicularis canadensis* and the giant hyssop (*Lophanthus nepetoides*); Weed & Foerste, Am. Nat. xviii. pp. 822-824, 928, & 929, figs.

Effects of Insects on plants; Gard. Chron. (2) xxii. p. 114.

On insectivorous plants in West Prussia; Conwentz, Schr. Ges. Danz. (2) vi. pp. 8 & 9.

Experiments on feeding *Drosera rotundifolia* with Insects; Büsgen, Bot. Z. xli. [1883] pp. 569-577 & 585-594; Bot. Centralbl. xvii. pp. 44 & 45.

"Die Entomocecidien," Ent. Nachr. x. pp. 205-209, is a general paper on galls.

Notes on various Scottish galls; Trail, Scot. Nat. i. pp. 206-216.

* List of galls found in Normandy; Gadéau de Kerville, Mém. ent. i. pp. 5-35.

On want of symmetry among Insects; discussing aberrations, gynandromorphism, malformations, &c., in butterflies and bees: Krancher, Psyche, iv. pp. 200-203.

Muscular power of Insects; Rouanet, Bull. Insect. Agric. ix. pp. 30-32 & 36-38.

Movements of the generative organs observed several days after death in *Brephos*, *Rhodocera*, and *Lucanus*; Poujade, Bull. Soc. Ent. Fr. (6) iv. p. xc.

On the changes of colour caused in Insects by exposure to light; Waterhouse and others, P. E. Soc. 1884, p. xvii.

On the action of potassium cyanide on organic colouring matter; Buckton, Ent. M. M. xxi. p. 82.

Local Fauna and Observations.

Insects migrating between England and Ireland; Cockerell, Ent. M. M. xxi. p. 159.

Capture of Insects at North Uist, St. Kilda, Harris, and Skye: Dale, Ent. M. M. xx. pp. 213, 214, 256, & 257; Scot. Nat. (2) i. p. 284.

List of *Coleoptera*, *Lepidoptera*, *Hymenoptera*, and *Diptera* captured in the province of Drenthe, Holland; Tijdschr. Ent. xxvii. pp. xx-xxii.

List of Insects collected by Costa in Sardinia; Nat. Sicil., Cenni Bibliografici, pp. 14-16.

Notes on Insects collected during an excursion to Monte Argentario, and to the Island of Giglio, in May, 1883; Dei, Bull. Ent. Ital. xvi. pp. 65-67.

Unimportant list of Insects (chiefly *Coleoptera*) collected in the Berlengas and Farilhões Islands (Portugal); Girard, Bol. Soc. Geogr. Lisb.

(4) ix. (sep. copy) pp. 39-42.

Appearance of Insects in North America in 1884; Canad. Ent. xvi. pp. 177-179.

Scarcity or abundance of various Insects in Canada in 1882; Claypole & Moffatt, Rep. E. Soc. Ont. 1883, pp. 33, 34, 38, & 39; in 1884, Canad. Ent. xvi. pp. 182-185.

Notes on various Insects observed at Ottawa: Tr. Ottawa Nat. Club, i. (1) [1880] pp. 46 & 47; i. (3) [1882] pp. 24-26; i. (4) [1883] pp. 75-81; and ii. (1) [1884] pp. 134-140.

Masses of Insects drifting in the river Ottawa; Harrington, Canad. Ent. xvi. pp. 17 & 18.

List of Insects captured at New Orleans in 1882-83, with occasional observations; Shufeldt, P. U. S. Nat. Mus. vii. pp. 331-338.

Notes on the Entomology of Vancouver Island ; Taylor, Canad. Ent. xvi. pp. 61 & 62.

Economic Entomology.

Edible Insects (locusts, *Parnus condimentarius*, Phil., and *Ephydra californica*, Pack., noticed) : J. Sparre Schneider, ° Naturen, vii. pp. 163-166 ; E. Seler, Biol. Centralbl. iv. pp. 281-283.

On the presence of grubs and maggots of injurious Insects in farm manure ; Ormerod, Agric. Stud. Gaz. (2) i. pp. 168-171.

Remedies for injurious Garden Insects ; J. S., Gard. Chron. (2) xxi. pp. 747 & 748.

Short Notes on Italian Agricultural Entomology, with titles of publications, &c. ; Bull. Ent. Ital. xvi. pp. 143-147 & 307-309.

Insecticides discussed : Gard. Chron. (2) xxii. p. 304 ; Bull. Ent. Ital. xvi. pp. 307 & 308 ; Psyche, iv. pp. 133 & 134 ; Bull. Insect. Agric. ix. pp. 121-127 ; Rov. Lapok, i. pp. 157-165 & xix.-xxii.

Bibliography, Nomenclature, &c.

Darwin's work in Entomology ; Riley, P. Biol. Soc. Washington, i. pp. 70-80.

List of publications relative to the Insects of the north-western plains of Germany, issued previous to 1884 ; Poppe, Abh. Ver. Brem. ix. pp. 31-38.

Notice of the Entomological journal kept by J. Boehm at Buda-Pest, 1795-8 ; Horváth, Rov. Lapok, i. pp. 217-223 & xxviii.

Legal proceedings against Insects in the Middle Ages ; Rogers, Canad. Ent. xv. pp. 212-216.

Discussion on various points of Entomological nomenclature : P. E. Soc. 1884, pp. vii. & viii. ; Canad. Ent. xvi. pp. 172-174 ; Bull. Brooklyn Soc. vii. pp. 87-89 ; C.R. ent. Belg. xxviii. pp. clviii.-clx. & clxv.-clxvii.

On the Melsheimer family and their collections ; Hagen, Canad. Ent. xvi. pp. 191-197.

Obituary notices of the following Entomologists, with lists of their works :—T. J. BOLD ; Tr. North. Durh. viii. pp. 33-46. O. J. FAHRÆUS ; Ent. Tidskr. v. pp. 111-114, 209, & 210. T. GLOVER ; Psyche, iv. pp. 115 & 116. A. DE GRASLIN ; Ann. Soc. Ent. Fr. (6) iii. pp. 561-564. O. HEER ; MT. schw. ent. Ges. vi. pp. 694-697. J. L. LECONTE & J. RAY ; Ann. Soc. Ent. Fr. (6) iii. pp. 571-576 & 565-570. LECONTE also ; Tr. Am. Ent. Soc. xi. pp. i.-xxviii. S. S. SAUNDERS ; P. E. Soc. 1884, pp. xl.-xlii., Ent. M. M. xx. pp. 278 & 279, and Rev. d'Ent. iii. pp. 271-277. J. C. SCHÖDTE ; Ent. Tidskr. v. pp. 101-110, 207, & 208.

Collecting, Preserving, &c.

Directions for collecting Insects ; Biro, Rov. Lapok, i. pp. 129-132 & xvii., 153-157 & xix., 177-181 & xxiv., 193-195 & xxv.

Mode of making Insect-boxes ; carbolic acid recommended for preserving specimens : Fischer, Canad. Ent. xvi. pp. 48 & 49.

Preservative fluid for Insects, &c., recommended; Kerremans, C.R. ent. Belg. xxviii. pp. cccxxxiv. & cccxxxv. (*cf.* also Bormans, p. cccxlvii.)

On mounting eggs of Insects for microscopic examination; Dimmock, *Psyche*, iv. p. 133.

Instrument for catching and examining Insects under a lens; R. Müller, Ent. Nachr. x. pp. 52-56 & 69, figs.

On collecting Insects in the beating net; Weeks, Bull. Brooklyn Soc. vii. p. 63.

COLEOPTERA.

BY

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

THE GENERAL SUBJECT.

* BIRO, L. Coleoptera collectionis Dris Cornelli Chyzer. Contrib. ad Faun. Com. Zemplén. in Hung. sup. in Act. sess. xii. Debreczin ann. 1882 medic. et nat. cur. Hung. Budapest: 1883, 8vo, pp. 40. (*Cf.* Zool. JB. 1883, ii. pp. 164 & 190.)

1994 species enumerated, 24 new to Hungary.

BOURGEOIS, J. Faune Gallo-Rhénane; ou, Species des Insectes qui habitent la France, la Belgique, la Hollande, le Luxembourg, la Prusse Rhénane, le Nassau et le Valais, avec tableaux synoptiques et planches gravées. Coleoptères. Tome 4^{me}, pp. 1-60. [Issued with Rev. d'Ent. iii. (sep. pag.)].

Includes *Cebrionides*, *Dascillides*, and the commencement of *Lycides*.

BRANDEN, C. VAN DEN. Catalog der Halipliden, Amphizoiden, Pelioiden, und Dytisciden. Bruxelles: 1884, 8vo, pp. 118.

BRENSKE, E., & REITTER, E. Neuer Beitrag zur Käferfauna Griechenlands (unter mitwirkung von E. Eppelsheim und L. Ganglbauer). Deutsche E. Z. xxviii. pp. 17-100, pls. i. & ii.

The *Staphylinide* are by Eppelsheim, the *Lamellicornes* by Brenske, the *Cerambycidae* by Ganglbauer, and the *Pterodactylidae* by Reitter. A large number of new species are added from Mém. Agric. Lille.)

Northern Morea. An account of arapterorum Halicidae. Leopoli: 1884, by Brenske, is prefixed to the paper. ii. p. 191.)

BUDDEBERG, — Beiträge zur Is Coléoptères de l'Ancien Monde JB. Nass. Ver. xxxvii. pp. 70-1

Life-history of 18 species. *ytelidae*.

F

CASEY, T. L. Contributions to the Descriptive and Systematic Coleopterology of North America. Philadelphia: 1884, 8vo, pts. i. & ii. pp. 1-138, plate. (Cf. Wien. ent. Z. iii. p. 256; Bull. Brooklyn Soc. vii. p. 79.)

A pamphlet (completed) uniform with Tr. Am. Ent. Soc., consisting chiefly of descriptions of new species.

CHALANDE, J. Les Lamellicornes et Pectinicornes Français. Bull. Soc. Toulouse, xviii. pp. 43-126.

Dichotomous tables of genera and species.

CORNELIUS, C. Verzeichniss der Käfer von Elberfeld und dessen Nachbarschaft, angeordnet in der Hauptgrundlage nach dem Catalogus Coleopterorum Europæ et Caucasii, auctoribus L. Von Heyden, E. Reitter et J. Weise, editio tertia, mit Bemerkungen. JB. Ver. Elberfeld, vi. pp. 1-61.

Includes about 2300 species. The list is preceded by a description of the localities.

FAIRMAIRE, L. Note sur quelques Coléoptères de Magellan et de Santa-Cruz. Ann. Soc. Ent. Fr. (6) iii. pp. 483-506.

List of species (chiefly from Punta Arena), with descriptions of many new ones.

Liste des Coléoptères recueillis par l'abbé David à Akbes (Asie-Mineure) et descriptions des espèces nouvelles. Ann. Soc. Ent. Fr. (6) iv. pp. 165-180.

The district is interesting, because it lies between the Taurus and the Lebanon, and the species obtained show an admixture of forms from Asia Minor and Syria.

FLACH, K. Die Käfer der unterpleistocänen Ablagerungen bei Hösbach unweit Aschaffenburg. Verh. Ges. Würzb. (2) xviii. pp. 285-297, pls. viii. & ix.

Remains of many recent species have been identified, as follows:—*Carabus thuermchii*, Flach (? race of *granulatus*, Linn.), *Cychrus rostratus*, Linn., *Chlenius 4-sulcatus*, Ill., *Feronia oblongopunctata*, Fabr., *athlops*, Panz., *diligens*, Sturm, *parallela*, Duftschm., *Patrobis exaratus*, Payk., *Amara aulica*, Panz., *famelica*, Zimm., *Trechus rivularis* and *Bembidium assimilis*, Gyll., *Colymbetes striatus* and *Hydrobius fuscipes*, Linn., *Cyclonotum orbiculare*, *Cytilus varius*, and *Erycus athiops*, Fabr., *C. acridulus*, Linn., *Oliorhynchus niger*, Fabr., *Timarcha metallica*, Laich., *Prasocuris aucta* and *Donacia sagittaria*, Fabr., *fennica*, Payk., *sericea*, Linn., and *discolor*, Panz., and *Silpha atrata*, Linn. These species show the prevailing character of the fauna to have been north-eastern, with an admixture

ihren: Halle: 1883, 8vo, pp. 4t, w

THIEME, O. Fragmentarisches über Arten of Predaceous Beetles. Rep. Ins. Coleopterenspecies verschiedener Gatt. xxviii. pp. 191-202. la.

Treats of the subject generally, as well as larvae of Longicornes, et autres pterous faunæ of certain countries, as the Cañi. pp. clxxi-clxxiv.

1834. [VOL. XXI.]

GERSTAECKER, A. Bestimmung der von G. A. Fischer während seiner Reise nach den Massai-Land gesammelten Coleopteren. JB. Hamb. Anst. i. pp. 43-63.

167 species (mostly new) from the neighbourhood of Kilimandjaro enumerated.

* HARRACH, A. Der Käfersammler. Praktische Anleitung zum Fangen, Präpariren, Aufbewahren, und zur Aufzucht der Käfer. Herstellung von trocknen Insektenpräparaten, Anfertigung mikroskopischer Objecte, Anlage biologischer Sammlungen, Insectarien, u. s. w., nebst ausführlichen Käferkalender. Weimar: 1884, 8vo. (Detailed notice by Von Schlechtendal, Z. Naturw. lvii. p. 639; cf. also Ent. Nachr. x. p. 331, and Wien. ent. Z. iii. pp. 287 & 288.)

HARRINGTON, W. H. Injurious Insects infesting the Hickory: *Coleoptera*. Rep. E. Soc. Ont. 1883, pp. 42-52, figs. 11-18.

No less than 48 species are enumerated, and the following (not all of which are hickory insects) are figured, sometimes with transformations:—*Lachnosterna fusca*, Fröhl., *Osmoderma scabra*, Beauv., *Dicerca divaricata*, Say, *Chrysobothris femorata*, Lec., *Superda candida*, Fabr., *Liopus facetus* and *Oncidera cingulata*, Say.

HEYDEN, L. VON. Beitrag zur Coleopterenfauna der Insel Askold und anderer Theile des Amurgebietes. Deutsche E. Z. xxviii. pp. 273-300.

Several species are described as new. Some of the notes on known species are of sufficient importance to find a place in the special part of Zool. Rec. Out of 139 species from Askold, 39 are also European, 28 are also Japanese, and 4 are common to Europe and Japan.

— Coleopterologische Ausbeute des Baron H. von Maltzan von der Insel Creta. T. c. pp. 363-368.

105 species enumerated, none new.

—, & EPPELSHEIM, E. Coleopterologische Ausbeute einer Excursion nach der Sierra d'España. T. c. pp. 355-361.

8 new species.

KOLBE, H. J. Ueber neue Goliathiden aus Central-Afrika, nebst Studien über einige dieselben betreffenden Probleme aus dem Gebiete der Phylogenie und Speciesbildung. B. E. Z. xxviii. pp. 77-96.

* MEINERT, F. Om Coleopterernes Elytra's (Dækvingers) Homologi. Förh. vid. 12^{te} Skand. Naturforskäremötet i Stockholm, 1880, Stockholm, 1883, p. 539.

* NORGUER, A. DE. Catalogue des Coléoptères du département du Nord. 1883, 8vo, pp. 197. (Repr. Bull. Brooklyn Soc. vi. p. 120, fig.

* LEMNICKI, A. M. Catalogus Coleopterum in spring; Fuchs, Bull. Brooklyn Soc. 8vo, pp. 43. (Cf. Wien. ent. Z. i.

MARSEUL, S. A. DE. Catalogue de (suite). L'Ab. xx. pp. 121-144, Ent. M. M. xxi. pp. 139 & 140; Fein, Extends from *Tachyporidae* to *Osmiini*.

PREUDHOMME DE BORRE, A. Matériaux pour la faune entomologique de la Province du Luxembourg belge. Publ. Luxembourg, xix. pp. 23-43 & 62-88.

A descriptive list, extending to the *Dytiscidæ*.

QUEDENFELDT, G. Verzeichniss der von D. von Mechow in Angola und am Quango-Strom 1878-81, gesammelten Pectinicornen und Lamellicornen. B. E. Z. xxviii. pp. 265-340.

155 species enumerated, many new.

REITTER, E. Resultate einer coleopterologische Sammel-Campagne während den Monaten Februar bis April, 1883, auf den jonischen Inseln. Deutsche E. Z. xxviii. pp. 101-122.

Includes descriptions of a considerable number of new species.

—. Beitrag zur Pselaphiden- und Scydmaeniden-Fauna von Java und Borneo. ii. Stück. Verh. z.-b. Wien, xxxiii. pp. 387-428, pl. xx.

Includes descriptions of a large number of new species from Borneo. In the larger genera, the East Indian species are frequently tabulated.

—. Bestimmungs-Tabellen der europäischen Coleopteren. x. Nachtrag zu dem v. Theile, enthaltend *Clavigeridæ*, *Pselaphidæ*, und *Scydmanidæ*. Op. cit. xxxiv. pp. 59-94.

—. Tableaux synoptiques des Paussides, Clavigérides, Pselaphides, et Scydmanides. Traduction de C. E. LEPRIEUR. (Suite.) L'Ab. xxi. pp. 73-216.

Extends from *Bythinus* to end.

* RUPERTSBERGER, —. Die Eier der Käfer. Natur und Offenbarung, xx. pp. 385-397 & 433-442.

* SCHENKLING, C. Die deutsche Käferwelt. 1 Lief. Leipzig: 1884, 3 col. pls. (Cf. Wien. ent. Z. iii. p. 31.)

SHARP, D. The Water-Beetles of Japan. Tr. E. Soc. 1884, pp. 439-464.

The total number of water-beetles now known from Japan is only about 40 species, much inferior to the European list, although in other groups the Coleopterous fauna is richer. Many new species are described in the present paper.

—. Results of an examination of some of White's types of New Zealand *Coleoptera* contained in the British Museum Collection at London. N. Z. J. Sci. ii. pp. 297-299.

Except in the case of one or two species positively identified, it is sufficient to call attention to this paper here.

SCHENK, E. Was ist Holzwurm, und wie erwehrt man sich berg; Quedenfeldt, B. E. Z. xxviii. pp. 100-105.

Captures of rare *Coleoptera* in Schles.

Schles.-Holst. v. pp. 120 & 121. Analogieen im Habitus zwischen

Interesting *Coleoptera* from Rosenberingen und Familien. B. E. Z. & 85.

* Duda has published a list of Bohemia with reference to the Coleo-Königgrätz, 1884 (cf. Wien. ent. Z. iv. pp. 10-15, Chili, and China.

WATERHOUSE, C. O. *Coleoptera* collected during the Expedition of H.M.S. 'Challenger.' Ann. N. H. (5) xiii. pp. 276-283.

Relates to species from Tristan d'Acunha, Ki Du'an, Aru, and Tahiti.

— On the Coleopterous Insects collected by H. O. Forbes in the Timor-Laut Islands. P. Z. S. 1884, pp. 213-219, pl. xvi.

29 species noticed, including a new genus and 7 new species.

E. A. Butler has published a series of semi-popular articles on Rove-Beetles, Weevils, Wireworms, and Skipjacks; Knowledge, v. pp. 26-28, 160, 161, 205, 206, & 327-329, woodcuts.

Notes on secondary sexual characters in *Coleoptera*: Horn, Canad. Ent. xvi. p. 185; Bull. Brooklyn Soc. vii. p. 93.

Sound-producing organs in *Anomala*, *Anthonomus*, and other *Coleoptera*; Patton, Psyche, iv. p. 146.

On the hibernation of *Coleoptera*; Simonet-Rev. d'Ent. iii. p. 316.

Remarkable gathering of beetles by the side of a new dock; Evans, Canad. Ent. xv. pp. 237 & 238.

Beetles attacking earthworms: P. E. Soc. 1884, pp. xviii. & xix; Nature, xxx. pp. 166 & 196; Ent. Nachr. x. p. 156.

Coleopterous larva which devours *Aphides* noticed and figured, with imago; Goethe, JB. Nass. Ver. xxxvii. p. 130, pl. iii. figs. 76 & 77.

Carnivorous beetles eating vegetable substances; Hart, Ent. xvii. pp. 260 & 261.

Bostrychus dispar, Herbst, *Scolytus rugulosus*, Ratz., and *Lathropus sepicola*, Müll., noticed as injurious to plum; Biro, Rov. Lapok, i. pp. 21 & iv.

Food-plants of various beetles bred in Maryland; Lugger, Psyche, iv. pp. 203 & 204.

The following beetles are enumerated by Saunders & Schwarz (Rep. E. Soc. Ont. 1883, pp. 29 & 30) as injurious to drugs in Canada:—*Sitodrepa panicea*, Linn., *Calandra remotopunctata*, Gyll., *Tenebrioides mauritanica*, Linn., *Tribolium ferrugineum*, Fabr., *Silvanus surinamensis*, Linn., *Anthrenus varius*, Fabr., *Lasioderma serricorne*, Fabr., and *Cryphalus jalappa*, Letzn.

Notes on 40 *Coleoptera* injurious to pines in Canada; Harrington, Tr. Ottawa Nat. Club, i. (2) pp. 28-33.

Short notes on various North American *Coleoptera*, relative to habits, localities, and collecting; Leng & Roberts, Bull. Brooklyn Soc. vii. pp. 76-79.

Beetle-trap; Schaupp & Lintner, Bull. Brooklyn Soc. 1884, p. 20, fig.

Hints on collecting *Coleoptera* in spring; Fuchs, Bull. Brooklyn Soc. vii. p. 6.

On collecting beetles in meadows; Bell, Rep. E. Soc. Ont. 1883, pp. 27 & 28.

On setting *Coleoptera*; Ellis, Ent. M. M. xxi. pp. 139 & 140; Fein, Z. E. Ver. schles. (2) ix. p. xx.

Local Fauna.

Additions and corrections to the last edition of "Catalogus Coleopterum Europæ et Caucasii," edited by Von Heyden, Reitter, & Weise: Editors, Wien. ent. Z. iii. pp. 177-184, 207-213, & 239-244; Von Harold & Bergroth, B. E. Z. xxviii. pp. 121-131 & 225-230; Von Heyden & Weise, Deutsche E. Z. xxviii. pp. 403-408, 435, & 436; Von Schlechtendal, Z. Naturw. lvii. pp. 103-105; Fauvel, Rev. d'Ent. iii. pp. 70-84, 240-245, & 293-310.

Captures of *Coleoptera* in Essex and Surrey, and at Shire; Lewcock & Capron, Ent. xvii. pp. 20, 21, 172-176, & 221-223. At Hastings and Lincoln; Collett & Fowler, Ent. M. M. xx. pp. 189 & 190, and xxi. p. 162. At Dulwich; Wood & Pim, Rep. Dulwich Coll. Soc. vi. pp. 52-54. At Rugby; Rep. Rugby School Soc. 1883, p. 48.

List of *Coleoptera* collected at Cauterets; Peragallo & Grouvelle, Bull. Soc. Ent. Fr. (6) iv. pp. lxxxvii. & lxxxviii.

Captures of *Coleoptera* at Arlon; Remy, C.R. ont. Belg. xxviii. p. ccxiii.

Second Supplement to Catalogue of Swiss *Coleoptera*; Stierlin, N. Denk. schw. Ges. xxviii. (3) pp. 1-98.

Notes on Alpine *Coleoptera*; Biasioli, Naturhistoriker, vi. pp. 3-5.

Captures of *Coleoptera* in Lorraine; Harmand, Feuille. Nat. xiv. p. 56.

Fourth Supplement to the list of *Coleoptera* of Nassau and Frankfurt, raising the number to 3334 species; Von Heyden, JB. Nass. Ver. xxxvii. pp. 56-69.

Kittel concludes his catalogue of Bavarian *Coleoptera*; CB. Ver. Regensb. xxxiii. pp. 18-32, 54-61, 65-94, & 97-103.

Notes on the *Coleoptera* of Westphalia, with special reference to those occurring at Witten and in the neighbourhood; Fügner & Westhoff, JB. westf. Ver. xii. pp. 66-75.

Additions to the list of *Coleoptera* of Bremen, with special reference to myrmecophilous species; Hollmann, Abh. Ver. Brem. viii. pp. 477-497.

Do. to that of Cassel; Bartels, Ber. Ver. Cassel, xxix. & xxx. pp. 101-104.

Do. to the Silesian *Coleoptera* in 1883; the present number is 4330 species: Letzner, JB. schles. Ges. lxi. pp. 313-315. Captures of rare and interesting beetles in Silesia; Fein & Kletke, Z. E. Ver. schles. (2) ix. pp. 1-5.

Notes on various rare or interesting *Coleoptera* occurring in Mark Brandenburg, the Forest of Dessau, and the neighbourhood of Wittenberg; Quedenfeldt, B. E. Z. xxviii. pp. 137-142, 179, & 180.

Captures of rare *Coleoptera* in Schleswig-Holstein; Wiese, Schr. Ver. Schles.-Holst. v. pp. 120 & 121.

Interesting *Coleoptera* from Rosenberg; Dohrn, S. E. Z. xlv. pp. 84 & 85.

* Duda has published a list of Bohemian *Coleoptera*; JB. k. k. Gymn. Königgrätz, 1884 (cf. Wien. ent. Z. iv. pp. 27 & 28).

WATERHOUSE, C. O. *Coleoptera* collected during the Expedition of H.M.S. 'Challenger.' Ann. N. H. (5) xiii. pp. 276-283.

Relates to species from Tristan d'Acunha, Ki Dula, Aru, and Tahiti.

— On the Coleopterous Insects collected by H. O. Forbes in the Timor-Laut Islands. P. Z. S. 1884, pp. 213-219, pl. xvi.

29 species noticed, including a new genus and 7 new species.

E. A. Butler has published a series of semi-popular articles on Rove-Beetles, Weevils, Wireworms, and Skipjacks; Knowledge, v. pp. 26-28, 160, 161, 205, 206, & 327-329, woodcuts.

Notes on secondary sexual characters in *Coleoptera*: Horn, Canad. Ent. xvi. p. 185; Bull. Brooklyn Soc. vii. p. 93.

Sound-producing organs in *Anomala*, *Anthonomus*, and other *Coleoptera*; Patton, Psyche, iv. p. 146.

On the hibernation of *Coleoptera*; Simonet-Revol, Rev. d'Ent. iii. p. 316.

Remarkable gathering of beetles by the side of a new dock; Evans, Canad. Ent. xv. pp. 237 & 238.

Beetles attacking earthworms: P. E. Soc. 1884, pp. xviii. & xix.; Nature, xxx. pp. 166 & 196; Ent. Nachr. x. p. 156.

Coleopterous larva which devours *Aphides* noticed and figured, with imago; Goethe, JB. Nass. Ver. xxxvii. p. 130, pl. iii. figs. 76 & 77.

Carnivorous beetles eating vegetable substances; Hart, Ent. xvii. pp. 260 & 261.

Bostrychus dispar, Herbst, *Scolytus rugulosus*, Ratz., and *Lathropus sepicola*, Müll., noticed as injurious to plum; Biro, Rov. Lapok, i. pp. 21 & iv.

Food-plants of various beetles bred in Maryland; Lugger, Psyche, iv. pp. 203 & 204.

The following beetles are enumerated by Saunders & Schwarz (Rep. E. Soc. Ont. 1883, pp. 29 & 30) as injurious to drugs in Canada:—*Sitodrepa panicea*, Linn., *Calandra remotopunctata*, Gyll., *Tenebrioides mauritanica*, Linn., *Tribolium ferrugineum*, Fabr., *Silvanus surinamensis*, Linn., *Anthrenus varius*, Fabr., *Lasioderma serricorne*, Fabr., and *Cryphalus jalappa*, Letzn.

Notes on 40 *Coleoptera* injurious to pines in Canada; Harrington, Tr. Ottawa Nat. Club, i. (2) pp. 28-33.

Short notes on various North American *Coleoptera*, relative to habits, localities, and collecting; Leng & Roberts, Bull. Brooklyn Soc. vii. pp. 76-79.

Beetle-trap; Schaupp & Lintneprij, Bull. Brooklyn Soc. ... 120, fig.

Hints on collecting *Coleoptera* in spring; Fuchs, Bull. Brooklyn Soc. vii. p. 6.

On collecting beetles in meadows; Bell, Rep. E. Soc. Ont. 1883, pp. 27 & 28.

On setting *Coleoptera*; Ellis, Ent. M. M. xxi. pp. 139 & 140; Fein, Z. E. Ver. schles. (2) ix. p. xx.

Local Fauna.

Additions and corrections to the last edition of "Catalogus Coleopterorum Europæ et Caucasii," edited by Von Heyden, Reitter, & Weise: Editors, Wien. ent. Z. iii. pp. 177-184, 207-213, & 239-244; Von Harold & Bergroth, B. E. Z. xxviii. pp. 121-131 & 225-230; Von Heyden & Weise, Deutsche E. Z. xxviii. pp. 403-408, 435, & 436; Von Schlechtendal, Z. Naturw. lvii. pp. 103-105; Fauvel, Rev. d'Ent. iii. pp. 70-84, 240-245, & 293-310.

Captures of *Coleoptera* in Essex and Surrey, and at Shiere; Lewcock & Capron, Ent. xvii. pp. 20, 21, 172-176, & 221-223. At Hastings and Lincoln; Collett & Fowler, Ent. M. M. xx. pp. 189 & 190, and xxi. p. 162. At Dulwich; Wood & Pim, Rep. Dulwich Coll. Soc. vi. pp. 52-54. At Rugby; Rep. Rugby School Soc. 1883, p. 48.

List of *Coleoptera* collected at Canterets; Peragallo & Grouvelle, Bull. Soc. Ent. Fr. (6) iv. pp. lxxxvii. & lxxxviii.

Captures of *Coleoptera* at Arlon; Remy, C.R. ent. Belg. xxviii. p. ccxiii.

Second Supplement to Catalogue of Swiss *Coleoptera*; Stierlin, N. Denk. schw. Ges. xxviii. (3) pp. 1-98.

Notes on Alpine *Coleoptera*; Biasioli, Naturhistoriker, vi. pp. 3-5.

Captures of *Coleoptera* in Lorraine; Harmand, Feuille. Nat. xiv. p. 56.

Fourth Supplement to the list of *Coleoptera* of Nassau and Frankfurt, raising the number to 3334 species; Von Heyden, JB. nass. Ver. xxxvii. pp. 56-69.

Kittel concludes his catalogue of Bavarian *Coleoptera*; CB. Ver. Regensb. xxxiii. pp. 18-32, 54-61, 65-94, & 97-103.

Notes on the *Coleoptera* of Westphalia, with special reference to those occurring at Witten and in the neighbourhood; Fügner & Westhoff, JB. westf. Ver. xii. pp. 66-75.

Additions to the list of *Coleoptera* of Bremen, with special reference to myrmecophilous species; Hollmann, Abh. Ver. Brem. viii. pp. 477-497.

Do. to that of Cassel; Bartels, Ber. Ver. Cassel, xxix. & xxx. pp. 101-104.

Do. to the Silesian *Coleoptera* in 1883; the present number is 4330 species: Letzner, JB. schles. Ges. lxi. pp. 313-315. Captures of rare and interesting beetles in Silesia; Fein & Kletke, Z. E. Ver. schles. (2) ix. pp. 1-5.

Notes on various rare or interesting *Coleoptera* occurring in Mark Brandenburg, the Forest of Dessau, and the neighbourhood of Wittenberg; Quedenfeldt, B. E. Z. xxviii. pp. 137-142, 179, & 180.

Captures of rare *Coleoptera* in Schleswig-Holstein; Wiese, Schr. Ver. Schles.-Holst. v. pp. 120 & 121.

Interesting *Coleoptera* from Rosenberg; Dohrn, S. E. Z. xlv. pp. 84 & 85.

* Duda has published a list of Bohemian *Coleoptera*; JB. k. k. Gymn. Königgrätz, 1884 (cf. Wien. ent. Z. iv. pp. 27 & 28).

List of Polish *Coleoptera*; Ulanowskiego, Sprawozd. Kom. fizyogr. xviii. pp. 1-60.

Catalogue of *Coleoptera* of Babia, with table of distribution; Stobieckiego, Sprawozd. Kom. fizyogr. xvii. pp. 4, 5, & 16-80.

Additions to the *Coleoptera* of Hungary; Frivaldszky, Term. füzetek, viii. pp. 286 & 287.

Do. to those of Sweden (26, some new); Thomson, Opusc. Ent. x. pp. 1028-1036.

Captures of *Coleoptera* in Lapland; H. Ten Kate, Tijdschr. Ent. xxvii. pp. 249 & 250.

Ragusa continues his list of Sicilian *Coleoptera* from *Dryptæ* to *Æchmites*; Nat. Sicil. iii. pp. 129-132, 192-196, 249-252, 273-276, & 301-304, and vii. pp. 1-6.

Captures of *Coleoptera* in Sicily; Leech, Ent. xvii. pp. 135 & 136.

Do. by Weyers at Aguilas, Spain; C.R. ent. Belg. xxviii. pp. ccvi. & ccvii.

List of captures of do. on the European and Asiatic shores of the Dardanelles respectively, and on the island of Prinkipo, near Constantinople; Von Heyden, Deutsche E. Z. xxviii. p. 362.

List of 183 *Coleoptera* from the islands of Saleijer and Poeloe-Katela; Ritsema, Tijdschr. Ent. xxvii. pp. 253-264.

Notice of Leconte and Horn's "Classification of the *Coleoptera* of North America," and other papers; Dohrn, S. E. Z. xlv. pp. 32-37, 113-125, & 442-447.

Synonymic notes (too numerous to be given in detail) on various North African *Coleoptera*; Bedel, Ann. Soc. Ent. Fr. (6) iv. pp. 222-224.

The following species, often confounded in North American collections, are differentiated:—*Triplox thoracica*, Say, and *flavicollis*, Luc.; *Brachyacantha indubitabilis*, Crotch, and *Hyperaspis signata*, Oliv.; *Epicrus pulicarius*, Er., and *Hister subrotundus*, Say; *Dromæolus striatus*, Lec., *cylindricollis*, Say, and *Nematodes penetrans*, Lec.; *Calopteron reticulatum*, Fabr., and *typicum*, Newm.; *Eudercus pini*, Oliv., and *Pseudocereus supernotatus*, Say: Hamilton, Canad. Ent. xvi. pp. 35 & 36.

List of *Coleoptera* of Ottawa (1003 species); Harrington, Tr. Ottawa Nat. Club, ii. (1) pp. 67-85.

Additions to list of Canadian do.; Harrington, Canad. Ent. xvi. pp. 44-47, 70-73, 96-98, & 117-119 (*cf.* also Rep. E. Soc. Ont. 1883, pp. 35 & 36).

Do. to list of do. of Cincinnati; Dury, J. Cincinn. Soc. vii. pp. 91 & 92.

Notes on do. observed in September on Brigantine Beach, New Jersey; Hamilton, Canad. Ent. xvi. pp. 186-190.

Notes on various do. of New Orleans; Shufeldt, P. U. S. Nat. Mus. vii. pp. 337 & 338.

The *Coleoptera* of Baltimore number 2239 species, belonging to 857 genera and 71 families; Lugg, J. Hopk. Univ. Circ. iii. p. 79.

Preponderance of *Mulocodermata*, *Edemeridæ*, *Longicornia*, and *Phytophaga* in South America; Kolbe, B. E. Z. xxviii. p. 393.

CICINDELIDÆ.

BATES, H. W. *Biologia Centrali-Americana. Insecta*, vol. i. pt. i. 4to, 1881-84, pp. x. & 316, pls. i.-xiii.

This volume of Godman & Salvin's great work is now completed. It includes 1086 species of *Cicindelidæ* and *Carabidæ*, belonging to 154 genera. "This is less than a tenth of the total number at present described from the whole world, which cannot be much less than 12,000." The general characteristics and relations of the Central American Fauna are discussed in a highly condensed manner, but at too great length to be copied in extenso, and they do not admit of abridgment.

SCHAUPP, F. G. Synoptic Tables of [North American] *Coleoptera: Cicindelidæ*. Bull. Brooklyn Soc. vi. pp. 73-108 & 121-126, pls. i.-v.

The species are all described and figured, and the following varieties (new) are described:—*Cicindela longilabris*, Say, varr. *perviridis*, Oregon, Newfoundland, &c., and *laurentii*, Colorado; *C. scutellaris*, Say (cf. p. 121), var. *nigrior*, Georgia, p. 87, *purpurea*, Oliv., varr. *graminea*, Kansas, California, p. 89, and *amæna*, Missouri, p. 90, *hæmorrhagica*, Lec., var. *pacifica*, California, p. 106, *abdominalis*, Fabr., var. *scabrosa*, Florida, p. 108, and *latesignata*, Lec., var. *tenuicincta* [West Virginia?], p. 122, fig.; *C. repanda*, Dej., larva noticed, p. 123.

Habits of *Cicindelidæ* in Kansas; Jones, Bull. Brooklyn Soc. vii. pp. 74-76.

Agrius fallaciosus, Chev. Position of genus discussed, and ♀ described; Lucas, Bull. Soc. Ent. Fr. (6) iii. pp. cxxxi.-cxxxiii. *Polyagrus schythei*, Phil., is a synonym; Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 483.

Platychile pallida, Fabr. Habits noticed; Trimen, P. E. Soc. 1884, p. xxiv.

Cicindela noticed, and 2 North American species figured; W. Saunders, Rep. Fruit-Grower's Ass. Ont. 1882, p. 279, figs. 12-16. Bates, Biol. Centr. Am. i. (1) pp. 257-259, figures his *C. euthales*, pl. xiii. fig. 3, and redescribes his *C. nephelota* and *C. hydrophoba* var. *taretana* (Flohr, MS.). *C. denticulata*, *hæmorrhoidalis*, and *splendida*, Hentz, descriptions reprinted; *C. bisignata*, Doukht., perhaps = *cinctipennis*, Lec.: Bull. Brooklyn Soc. vi. pp. 109, 110, & 123. *C. circumdata*, Dej., var. *imperialis*, Klug, noticed from Sicily; Ragusa, Nat. Sicil. iii. p. 316. *C. hybrida*, Linn., and *maritima*, Dej.: habits, variation, and specific claims discussed; C.R. ent. Belg. xxviii. pp. xlviii.-liii., clxxxi., ccx., cexi., cclxii., cclxxvii.-cclxxvi., cccxxi., ccxxxxvi., & ccxxxxvii. *C. sachaliensis*, Moraw., noticed from Askold; Von Heyden, Deutsche E. Z. xxviii. p. 273. *C. sexguttata*, Fabr.: variation in markings of the elytra discussed; Townsend & Hague, Canad. Ent. xvi. pp. 125-127, 205-208, & 239. *C. vulgaris*, Say: habits, proportion of sexes, &c., discussed; Townsend, t. c. pp. 227-231.

Peridexia hilaris, Fairmaire, redescribed; S. E. Z. xlv. p. 129.

Therates monstrensis, Putz., = *schaumi*, Chaud.; Ritsema, Notes Leyd. Mus. vi. p. 134.

Elliptica, g. n., Fairmaire, C.R. ent. Belg. xxviii. p. lxx. Allied to *Cicindela*: elytra elliptical. Type, *E. flavovestita*, id. t. c. p. lxx, East Africa.

Omus ambiguus, sp. n., Schaupp, Bull. Brooklyn Soc. vi. p. 121, California.

Cicindela horni (= *anthracina*, Horn, nec Klug), New Mexico, and *lunalonga*, Sierra Nevada, California, id. t. c. pp. 88 & 122, fig.; *C. chrysippe*, fig. 2, p. 257, *dugesi*, Mexico, p. 258, and *castissima*, fig. 1, pl. xiii., Arcas Islets, Gulf of Mexico, p. 260, Bates, Biol. Centr. Am. Col. i. (1); *C. megaspilota*, Dohrn, S. E. Z. xlv. p. 43, Turkestan: spp. nn.

Odontocheila exilis, sp. n., Bates, t. c. p. 260, pl. xiii. fig. 4, Panama.

CARABIDÆ.

BATES, H. W. [See CICINDELIDÆ.]

On *Carabidæ* confined to single plants; Schwarz, Bull. Brooklyn Soc. vi. pp. 135 & 136.

Note on Hungarian plant-feeding *Carabidæ*; Horváth, Rov. Lapok, i. pp. 233, 234, & xxix.

Omophronides.

Omophron, Latr. (1802), = *Epactius*, Schneid. (1791): Bergroth, B. E. Z. xxviii. p. 229.

Elaphrides.

Notiophilus. Structure of legs noticed; Thomson, Bull. Soc. Ent. Fr. (6) iii. p. cxii. *N. bigeminus*, sp. n., id. t. c. p. cxiii., Northern and Central Europe.

Carabides.

KRAATZ-KOSCHLAN, A. VON. Kritische und nicht kritische Bemerkungen über die *Procerus*-Arten. Deutsche E. Z. xxviii. pp. 386-400. (Supplementary remarks on specific characters; Kraatz, t. c. pp. 401 & 402.)

Discusses the relationship, size, sculpture, colours, &c., of the various species.

— Die Farben der *Carabus*-Arten und ihrer nächsten Verwandten. T. c. pp. 369-385.

When specimens are treated with a solution of gum-arabic, and then cleaned, the colours are frequently much altered. The writer considers that this process removes a preservative substance which covers the surface of the insect during life and disguises its real colours.

Variation in *Carabidæ* tends towards free movement of the front of the body; Kolbe, B. E. Z. xxviii. p. 392.

Géhin notices the following *Carabidæ* [Bull. Soc. Ent. Fr. (6) iii. pp. cxiii. & cxiv.]:—*Chaetomelas ehrenbergi*, Klug (varr. *piochardi* and *labrulerici*, Géhin), *Macrogenius clypeatus*, Adams (and var. ? *fischeri*,

Fald.), and *Sphodristus talychensis*, Mén., *luctuosus*, Zoubk., and *acuticollis*, Motsch.

Geodephagous larva (probably belonging to a *Leistus* or a *Nebria*) coughed up by a young man at Maldon when suffering from bronchitis; Fitch, P. E. Soc. 1884, p. vii.

Nebria brevicollis, Fabr., var. (?) *dubia*, Sahlb., recorded from Dinant; De Borre, C.R. ent. Belg. xxviii. p. cccxl. *N. dahli*, Sturm, and varr. *littoralis*, Dej. (= *bonellii*, Dej.), and *velebitioa*, Von Heyd., discussed; Von Heyden, Deutsche E. Z. xxviii. p. 171.

Leistus megaloderus, Chaud., = *magnicollis*, Motsch.; Reitter, Deutsche E. Z. xxviii. p. 36.

Carabus auratus, Linn.: monstrosities noticed; De Borre & Demoor, C.R. ent. Belg. xxviii. pp. clxx., cccxxxix., & cccxxi. *C. cancellatus*, Fabr., and *glabratus*, Payk.: tracheal system of imago infested by the larvæ of a *Tachina*; Cholodkowsky, Zool. Anz. vii. pp. 316-319; Ann. N. H. (5) xiv. pp. 74-76. *C. cancellatus* with eight legs; Landois, Zool. Gart. xxv. pp. 287 & 288. *C. catenatus* var. *korlevici*, Hoffm., = *subvirens*, Motsch.; Reitter, Wien. ent. Z. iii. p. 33. *C. forreri*, Bates, redescribed and figured by him; Biol. Centr. Am. Col. i. (1) p. 261, pl. xiii. fig. 5. *C. glabratus*, Payk., feeding on the honey of the heath; H. N. Ridley, Ent. M. M. xx. p. 214. *C. purpurascens*, Fabr.: variation and differentiation of allied forms discussed; Kolbe, B. E. Z. xxviii. pp. 95 & 96. *C. stscharowskyi*, Solsky, noticed; Dohrn, S. E. Z. xlv. pp. 406 & 407. *C. weisei*, Reitt.: locality; Schaufuss & Reitter, Bull. Soc. Ent. Fr. (6) iii. p. cxvi., and iv. p. xl. *C. (Sphodristus) armeniacus*, Mannerh., varr. *repletus*, *scintillus*, and *decoloratus* from Svanetia noticed; Reitter, Wien. ent. Z. iii. p. 143.

Plectes kumarowi, Reitt. Reitter describes several varieties, including var. *rubellis* from the Latpari Pass; Wien. ent. Z. iii. pp. 142 & 143.

Calosoma peregrinator, Guér. (= *carbonatum*, Lec.), and *cicatricosum*, Chaud.: habits, range, &c., discussed; the latter is distinct from *C. levigatum*, *politum*, *striatulum*, and *striatipenne*, with which Bates formerly associated it: Bates, Biol. Centr. Am. Col. i. (1) p. 262. *C. calidum* and *scrutator*, Fabr., noticed and figured; W. Saunders, Rep. Fruit-Growers' Ass. Ont. 1882, p. 280, figs. 25 & 26. *C. antinorii*, Gestro, referred by him to *Callisthenes*; Ann. Mus. Genov. xx. p. 302.

Callisthenes seminowi, Motsch., = *elegans*, Kirsch; Dohrn, S. E. Z. xlv. p. 405.

Pseudotribax, g. n., Kraatz, Deutsche E. Z. xxviii. p. 217. Allied to *Tribax* and *Lamprocarabus*. Type, *P. validus*, sp. n., t. c. p. 218, Osch.

Carabus brachycerus, Gerstaecker, JB. Hamb. Anst. i. p. 43, Kilimanjaro; *C. thuermchii*, Flach, Verh. Ges. Würzb. (2) xviii. p. 3, pl. viii. fig. 1, Hösbaach, near Aschaffenburg (Lower Pleistocene): spp. nn.

Macrogenius caucasicus, sp. n., Géhin, Bull. Soc. Ent. Fr. (6) iii. p. cxiv, Caucasus.

Calosoma flohri, sp. n., Bates, Biol. Centr. Am. Col. i. (1) p. 262, Mexico.

Callisthenes rugiceps, Kraatz, Deutsche E. Z. xxviii. p. 219, Osch; *C. declivis*, Dohrn, S. E. Z. xlv. p. 405, Issik Kul: spp. nn.

Cychrides.

Cychrus intermedius, Hampe, *nec* Heer, renamed *hampei*; Von Heyden, Deutsche E. Z. xxviii. p. 171.

Scaphinotus mexicanus, Bates, redescribed and figured by him; Biol. Centr. Am. Col. i. (1) p. 263, pl. xiii. fig. 6.

Odontacanthides.

Cusnonia, Latr., = *Colliuris*, De Geer; Bergroth, B. E. Z. xxviii. p. 230.

Cusnonia lineolata, Bates, Biol. Centr. Am. Col. i. (1) p. 294, pl. xiii. fig. 23, Panama; *C. sipolisi*, R. Oberthür, Bull. Soc. Ent. Fr. (6) iv. p. xlviii., Minas Geraes: spp. nn.

Stenidia hovana, sp. n., Fairmaire, S. E. Z. xlv. p. 273, Madagascar.

Galeritides.

Galerita geniculata, Dej., = *Americanus*, Linn.; Bates, Biol. Centr. Am. Col. i. (1) p. 294.

Diaphorus elegans, Chaud., noticed and figured; *id. t. c.* p. 295, pl. xiii. fig. 11.

Galerita mustelina, Costa Rica, and *championi*, Panama, Bates, Biol. Centr. Am. Col. i. (1) p. 294; *G. quadricostata*, Gerstaecker, JB. Hamb. Anst. i. p. 44, Kilimandjaro: spp. nn.

Brachynides.

Brachynus emgei, Reitter, Deutsche E. Z. xxviii. p. 39, Attica (probably a transitional form between *B. exhalans*, Rossi, and *B. bipustulatus*, Quens.); *B. hirsutus*, Bates, Biol. Centr. Am. Col. i. (1) p. 295, Mexico: spp. nn.

Lebiides.

Cymindis heydeni, Kraatz (*nec* Oliviera), renamed by him *angustior*; Deutsche E. Z. xxviii. p. 156.

Philopheuga viridicollis, Lec., var. from Mexico noticed; Bates, Biol. Centr. Am. Col. i. (1) p. 297.

Lebia bifenestrata, Mor., noticed; Von Heyden, Deutsche E. Z. xxviii. p. 289. *L. trimaculata*, Vill., var. *destefunii* from Sicily described and figured; Ragusa, Nat. Sicil. iii. p. 316, pl. iii. fig. 8. *L. grandis*, borea, and *solea*, Hentz: descriptions reprinted; Bull. Brooklyn Soc. vi. pp. 110 & 111.

Plochionus valens, Lec., = *pallens*, Fabr.; Bates, *t. c.* p. 297.

Neotarus, g. n., Reitter, Deutsche E. Z. xxviii. p. 36. Allied to *Cymindis*, but labial palpi thickened, 2nd joint short, the last large, securiform, twice as long as the preceding; episterna of metasternum long, not appendiculate; prothorax oblong, cordate, truncated before and behind. Type, *N. krueperi*, sp. n., *t. c.* pl. i. figs. 1 & 1a, Attica.

New species:—

Metabola virida, Bates, Biol. Centr. Am. Col. i. (1) p. 298, Arizona, Mexico.

- Callida tinctipes*, Bates, *t. c.* p. 298, pl. xiii. fig. 24, Panama.
Cymindis kalavrytana, Reitter, Deutsche E. Z. xxviii. p. 38, Northern
 Morea; *C. uniseriata*, Bates, *t. c.* p. 296, Mexico.
Apenes calligramma, *id. t. c.* p. 297, pl. xiii. fig. 22, Panama.
Dromius longulus, Frivaldszky, Term. füzetek, viii. p. 279, Hungary.
Metabletus signifer, Reitter, *t. c.* p. 105, Corfu.

Pericalides.

- Phlæozena graphiptera*, Chaud., var. *limbicollis* from Panama noticed ;
 Bates, Biol. Centr. Am. Col. i. (1) p. 295.
Catascopus amænus, Chaud., var. from Maroe noticed ; Waterhouse,
 P. Z. S. 1884, p. 243.
Coptodera robusta, sp. n., Bates, Biol. Centr. Am. Col. i. (1) p. 296,
 Costa Rica.
Onota fulvella, *id. t. c.* p. 297, pl. xiii. fig. 25, Panama.

Pseudomorphides.

- Gestro, Ann. Mus. Genov. xx. pp. 302 & 303, notices *Silphomorpha*
maculata, Newm. (= *quadrisignata*, Cast.), *maculigera*, Macl. (= *bris-*
banensis, Cast.), *biplagiata*, Cast. (= *bimaculata*, Cast.), *fugax*, Westw.
 (= *guttata*, Macl.), and *suturalis*, Germ. (= *rufomarginata*, Macl.), and
Acelotopus obscurus, Cast. (= *subopacus*, Macl.), and *gyrinoides*, Hope
 (= *paroensis*, Cast.).
Silphomorpha bivittata (= *bicolor* var., Cast.), sp. n., *id. t. c.* p. 302,
 Port Jackson.

Ozænides.

- Pachyteles longicornis* and *inflatus*, spp. nn., Bates, Biol. Centr. Am.
 Col. i. (1) pp. 263 & 264, pl. xiii. figs. 7 & 8, Panama.

Siagonides.

- Siagona mandibularis*, Guér., *fuscipes*, Bon., and *Scarites striatidens*,
 Chaud., noticed from the Lower Niger ; Bates, P. Z. S. 1884, p. 404.

Ditomides.

- Aristus sphærocephalus*, Oliv. White variety noticed ; Barbier, Feuille.
 Nat. xv. p. 22.
Penthus tenebrioides, Waltl, redescribed and contrasted with a new
 species ; Reitter, Wien. ent. Z. iii. p. 249.
Penthus brevicollis, sp. n., Allard, Wien. ent. Z. iii. p. 249,
 Lenkoran.

Graphipterides.

- Graphipterus discicollis* and *castanopterus*, spp. nn., Fairmaire, C.R.
 ent. Belg. xxviii. p. lxxi., E. Africa.
Piezia stenotrachela, *id. ibid.*, E. Africa.

Anthiides.

- Anthia duparqueti*, Luc., = *omostigma*, Chaud., but *A. cinctipennis*,

Leq., probably = *maxillosa*, Fabr.; Dohrn, S. E. Z. xlv. pp. 177, 178, 404, 408, & 409.

Anthia artemis, sp. n., Gerstaecker, JB. Hamb. Anst. i. p. 43, Kilimandjaro.

Polyhirma trilunata, *id. ibid.*, Kilimandjaro; *P. griseescens* and *griseostriata*, Fairmaire, C.R. ent. Belg. xxviii. p. lxxi., E. Africa: spp. nn.

Scaritides.

Bates, Biol. Centr. Am. Col. i. (1) pp. 264 & 265, notices *Distichus septentrionalis*, Bates, *Schizogenius tristriatus*, Putz., var., and *Scarites subterraneus*, Fabr., var.

Scarites ebeninus, Arrib., = *Distichus mastus*, Chaud.; Berg, An. Soc. Arg. xvi. p. 268.

Crepidopterus pipitzii, sp. n., Fairmaire, S. E. Z. xlv. p. 274, Madagascar.

Scarites turkestanicus and *basiplicatus*, Von Heyden, Deutsche E. Z. xxviii. pp. 219 & 229, Margellan, &c.; *S. rapax*, Fairmaire, t. c. p. 129 (referred to *Dyscherus*; *id. t. c. p. 274*), Madagascar: spp. nn.

Reicheia coreyrea, sp. n., Reitter, Deutsche E. Z. xxviii. p. 103, Corfu.

Panagæides.

Sabienus usgentensis, sp. n., Von Heyden, Deutsche E. Z. xxviii. p. 222, Ugent.

Chlænides.

Bates, Biol. Centr. Am. Col. (1) i. pp. 267-269, notices *Stenous duodecimstriatus*, Chaud. (= *S. lecontei*, Chaud., ♀, *Oodes quatuordecimstriatus*, Lec., and *striatellus*, Laf.), *tibialis*, Chevr. (= *Oodes pallipes*, Brulle), *Stenocrepis chalcas*, Bates (= *chalcochrous*, Chaud.), *Anatrichis piceus*, Motsch. (= *Oodiellus mexicanus*, Chaud.), and *alutaceus* (= *O. mexicanus*, ♀, Chaud.).

Chlænus velutinus, Duft., var. n. *faulle* from Sicily described, and var. *borgie*, Dej., noticed; Ragusa, Nat. Sicil. iii. pp. 303, 332, & 333.

Chlænus forreri and *planulatus*, spp. nn., Bates, Biol. Centr. Am. Col. i. (1) p. 266, pl. xiii. figs. 10 & 9, Mexico.

Licinides.

Dicælus lævipennis, Lec., = *flohri*, Bates, var.; Bates, Biol. Centr. Am. Col. i. (1) p. 269.

Baudia, g. n., Ragusa, Nat. Sicil. vii. p. 3. Not characterized; placed after *Badister*. Type, *Carabus peltatus*, Panz.

Cnemacanthides.

Barypus magellanicus, Phil., = *Cardiophthalmus clivinoides*, Curt.; Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 484.

* *Cnemacanthus plicicollis*, sp. n., *id. ibid.*, Punta Arena.

Stomides.

Craspedonotus margellanicus, sp. n., Kraatz, Deutsche E. Z. xxviii. p. 229, Margellan.

Cratocerides.

- *Amblygnathus nigripennis*, sp. n., Bates, Biol. Centr. Am. Col. i. (1) p. 276, Panama, Upper Amazons.

Anisodactylides.

- Anisodactylus arizonæ*, sp. n., Casey, Col. N. Am. p. 6, Arizona.
Anisotarsus foveicollis, Guatemala, Panama, and *castaneus*, Mexico, spp. nn., Bates, t. c. pp. 269 & 270.
Notiobia chiriquensis, pl. xiii. fig. 10, Chiriqui, and *umbrifera*, Panama, Upper Amazons, spp. nn., *id. t. c.* pp. 270 & 271.
Gynandropus levicollis, sp. n., *id. t. c.* p. 276, Panama, Colombia.

Harpalides.

- Bates, Biol. Centr. Am. Col. i. (1) pp. 272-274, notices *Selenophorus subaneus*, Reiche, *affinis*, Dej., and *valgus*, Bates, var., and *Discoderus distortus*, Bates (structure).

Cratacanthus dubius, Beauv., and allies, tabulated and described; Casey, Col. N. Am. pp. 73-75.

Bradycellus rufithorax, Sahlb., recorded as new to Sweden, and re-described; Lampa, Ent. Tidskr. v. pp. 61 & 62. *B. parallelus*, Hald., is probably distinct from *rupestris*, Say; Casey, t. c. p. 79.

➤ *Atachynemis*, Blackb., and *Anchomenus muscicola*, Blackb. Characters discussed; T. Blackburn, Ent. M. M. xxi. p. 25.

Pseudophonus minor, Reitt., = *seriatus*, Chaud., but is distinct from *Harpalus polyglyptus*, Schaum; both species, however, as well as *H. metallicus*, Ménét., belong to *Pseudophonus*: Reitter, Wien. ent. Z. iii. p. 33.

Harpalus mutabilis, Hald., and *viridiceneus*, Beauv., noticed, and the latter and its allies tabulated; Casey, Col. N. Am. p. 11. *H. lucidus*, Lec. (*nec* Mor.), renamed *lustrans*; *id.* Bull. Brooklyn Soc. vii. p. 64. *H. ovalis*, Reiche, re-described by Thomson, who considers it distinct from *melancholicus*, Dej.; Bull. Soc. Ent. Fr. (6) iv. pp. xxxiii. & xxxiv. *H. picipennis*, Duft, discussed; Thomson, J. A. S. B. lii. pp. cxx. & cxxi. *H. quadripunctatus*, Dej., with irregular punctuation, recorded from Somersetshire; Blatch, Ent. M. M. xx. p. 191.

Acupaipus, Latr. Table of European species (including *Anthracus*, Motsch., as a subgenus). Several new species are described; and several varieties of *A. dorsalis*, Fabr., one of which (*lusitanus*) appears to be new. Reitter, t. c. pp. 74-79.

New genera and species:—

➤ *Amerinus*, Casey, Col. N. Am. p. 7. Allied to *Bradycellus*, but very long and slender. Type, *B. linearis*, Le Conte.

Glycerius, *id. t. c.* p. 79. Allied to *Bradycellus* and *Tachycellus*. Type, *B. nitidus*, Dej.

Cratacanthus litoreus, New Jersey, p. 74, *bisectus*, Philadelphia, and *texanus*, Texas, p. 75, Casey, Col. N. Am.

Paramecus brevisculus, Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 485, Patagonia.

Bradycellus lucidus, Casey, *t. c.* p. 8, Arizona.

Selenophorus aeneopiceus, Arizona, and *perpolitus*, Texas, *id. t. c.* pp. 13 & 76; *S. multiporus*, fig. 13, Panama, *chryses*, Guatemala, Nicaragua, Panama, p. 272, *dives*, fig. 12, pl. xiii., Panama, *tubericauda*, p. 273, *suavis* and *hepburni*, Mexico, p. 274, Bates, Biol. Centr. Am. *Col. i.* (1).

Discoderus acinopoides, *melanthus*, and *pulvinatus*, *id. t. c.* p. 275, Mexico; *D. pinguis*, Casey, *t. c.* p. 75, Arizona.

Ophonus suturifer, Reitter, Wien. ent. Z. iii. p. 33, Corfu.

Pseudophonus minor, *id.* Deutsche E. Z. xxviii. p. 41, pl. i. fig. 3, Attica.

Harpulus opacus (referred to *Anisodactylus*; *cf.* p. 198), Pennsylvania, p. 8, *manhattanis*, New York, p. 9, *vespertinus*, Arizona, *placidus*, Long Island, p. 10, *convictor* (= next; *cf.* p. 195), Long Island, *canonicus*, Rhode Island, *lustralis*, New York State, and *anescens*, Rhode and Long Islands, p. 12, Casey, *t. c.* [the 3 last probably = *viridiceneus*, Beauv., varr.; *cf.* p. 195]; *H. multisetosus*, Thomson, Bull. Soc. Ent. Fr. (6) iii. p. cxxi., Europe.

Acupalpus interstitialis, Banat, p. 74, *morulus*, Syria, *paludicola*, Greece, Syria, and *oliviera*, Portugal, p. 75, Reitter, Wien. ent. Z. iii.

Anthraxias quarnerensis, Veglia, and *insignis*, Corfu, *id. t. c.* pp. 78 & 79; *A. insignis*, *id.* Deutsche E. Z. xxviii. p. 104, Corfu.

Stenolophus gracilis, Arizona, and *scitulus*, Philadelphia, Casey, *t. c.* pp. 14 & 78.

Trigonotomides.

Oxycrepis and *Stolonis* are not distinct; *O. communimacula*, Chaud., appears to be a slight local variety of *S. notula*, Motsch.; and these may be only varieties of *O. leucocera*, Dej.: Dohrn, S. E. Z. xlv. p. 281.

Feroniides.

HAMILTON, J. The Survival of the Fittest among certain species of *Pterostichus*, as deduced from their habits. Canad. Ent. xvi. pp. 73-77.

Relates to 16 species occurring at Alleghany, Pennsylvania.

Pterostichus melanarius, Illig., destructive to strawberries; Horner, Ent. xvii. pp. 238 & 239. *P. tiefenbachi*, Schaum (= *rebellis*, Reiche), and var. *kumanensis*, noticed; Reitter, Deutsche E. Z. xxviii. pp. 40 & 41.

Zabrus gibbus, Fabr. Ravages in Hungary; Lipovniczky, Rov. Lapok, i. pp. 84, 85, & xi.

Ithyotus, g. n., Bates, Biol. Centr. Am. *Col. i.* (1) p. 277. Placed after *Ophryogaster*; "a remarkable genus, partaking of the characters of both the subfamilies *Pterostichinae* and *Anchomeninae*." Types, *Cyrtoloba lobipennis*, Bates, and *I. anomalus*, sp. n., *t. c.* p. 278, pl. xiii. fig. 15, Mexico.

New species:—

Eucamptognathus abaciformis, Fairmaire, S. E. Z. xlv. p. 130, Madagascar.

Pacilus staudingeri, Von Heyden, Deutsche E. Z. xxviii. p. 221, Usgent.

Loxandrus sculptilis, Bates, Biol. Centr. Am. Col. i. (1) p. 278, pl. xiii. fig. 14, Mexico, Panama.

Steropus ovicollis, Reitter, Deutsche E. Z. xxviii. p. 40, pl. i. fig. 2, Eubœa.

Pterostichus zephyrus and *osculans*, N. Mexico (?), p. 2, and *manhattanis*, New York, p. 72, Casey, Col. N. Am.; *P. (Melaninus) cordaticollis*, Von Heyden, t. c. p. 221, Osch.

Abax hetzeri, Müller, Deutsche E. Z. xxviii. p. 420, Italy.

Trichosternus erythropus, p. 226, *meritus*, *angulatus*, *convexus*, *agriotes*, *erraticus*, *riparius*, *curtulus*, *suspiciæ*, and *amplicollis*, p. 227, Broun, N. Z. J. Sci. ii., New Zealand.

Zabrus tenuistriatus, Fairmaire, Le Nat. vi. p. 446, Casablanca; *Z. rugulosus*, Kraatz, Deutsche E. Z. xxviii. p. 231, Asia Minor.

Amara apachensis, Arizona, p. 3, *marylandica*, Maryland, p. 4, *pallida*, New York, and *ferruginea*, New Jersey, p. 5, Casey, t. c.

Antarctides.

Antarctia madon, p. 485, *cyanoidea*, *grandipennis*, p. 486, *falsicolor*, *pogonoides*, and *bradytoides*, p. 487, spp. nn., Fairmaire, Ann. Soc. Ent. Fr. (6) iii., Patagonia.

Anchomenides.

SHARP, D. On some genera of the subfamily *Anchomenini* (*Platynini*, Horn) from the Hawaiian Islands. Ent. M. M. xx. pp. 217-219.

Discusses *Blackburnia*, Sharp, *Disenochus* and *Atrachynemis*, Blackb., *Cyclothorax*, Motsch., and 3 new genera.

Anchomenus batesi and *parabilis* and *Calathus* (?) *deformipes*, Broun, figured; Waterhouse, Aid, iii. pl. cxlix. figs. 7-9.

Bates, Biol. Centr. Am. Col. i. (1) pp. 279 & 280, notices *Calathus gregarius*, Say (?), and *Anchomenus extensicollis*, Say, var.

Pristonychus algerinus, Gory, and *curtulus*, Motsch., differentiated; Reitter, Wien. ent. Z. iii. pp. 35-37.

Taphria congrua, Moraw., noticed; Von Heyden, Deutsche E. Z. xxviii. p. 288.

Anchomenus elevatus, White, = *novæ-zealandiæ*, Fairm.; Sharp, N. Z. J. Sci. ii. p. 297 (but cf. Dohrn, S. E. Z. xlv. pp. 318-320).

New genera and species :—

Metromenus, Sharp, Ent. M. M. xx. p. 217. To include the majority of the Hawaiian species hitherto placed in *Anchomenus*, *Colpodes*, and *Dyscolus*, from which it is distinguished by the total absence of systematic setæ on the pronotum; *A. mysticus*, Blackb., is somewhat aberrant.

Colpodiscus, id. *ibid.* Allied to *Anchomenus*: scutellum scarcely penetrating between the basal margins; pronotum with a single systematic seta. Types, *Anchomenus lucipetens* and *Dyscolus tantalus*, Blackb.

Barypristus, id. *ibid.* Allied to *Anchomenus* and *Colpodes*, but without the exterior systematic seta on the pronotum; and metathoracic

epimera prolonged externally. To include *Anchomenus sharpi*, Blackb., and 2 other Hawaiian species.

Mauna, Blackburn, Ent. M. M. xxi. p. 25. Allied to *Blackburnia*.

Type, *B. frigida*, Blackb.

Sphodrus krueperi (Von Certeu, MS.), Miller, Verh. z.-b. Wien, xxxiii. p. 263, Parnassus.

Antisphodrus extensus, Von Heyden, Deutsche E. Z. xxviii. p. 220, Osch.

Platynus chihuahua, Bates, Biol. Centr. Am. Col. i. (1) p. 279, Mexico.

Anchomenus semistriatus, Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 488, Patagonia; *A. charmis*, p. 280, *xanthocnemis*, *cyclifer*, and *ovatus*, p. 281, Bates, t. c., Mexico.

Glyptolenus latitarsis, *id. t. c.* p. 282, pl. xiii. fig. 19, Panama.

Colpodes nyctimus, p. 282, *minimus*, fig. 17, *petilus*, Mexico, p. 283, *eudemus*, fig. 16, *epilissus*, Panama, *lucilius*, Mexico, p. 284, *cleantes*, Costa Rica, *viridans*, Panama, p. 285, and *rufulus*, fig. 18, Guatemala, p. 286, *id. t. c.* pl. xiii.

Onypterygia valdestriata and *rubida*, *id. t. c.* p. 286, Mexico.

Pogonides.

Trechus rhilensis, sp. n., Kaufmann, Wien. ent. Z. iii. p. 145, Bulgaria.

Anophthalmus certzeni, sp. n., Miller, Verh. z.-b. Wien, xxxiii. p. 264, Parnassus.

Anchonoderides.

Anchonoderis myops, Reiche, var. *duplicatus* (? = *reichei*, Putz.), from Panama, and *Lachnophorus guttulatus*, Bates, noticed; Bates, Biol. Centr. Am. Col. i. (1) pp. 292 & 293.

Anchonoderis infirmus, sp. n., *id. t. c.* p. 292, Panama.

Euphorticus lucidus, sp. n., *id. t. c.* p. 293, Panama.

Callistominus dicksoni, Waterhouse, Ann. N. H. (5) xiv. p. 429, Formosa.

Bembidiides.

REITTER, E. Bestimmungs-Tabelle der mit *Tachys* verwandten Coleopteren. Wien. ent. Z. iii. pp. 116-124.

Includes *Tachys*, Steph. (divided into Motschulsky's 3 subgenera *Tachyura*, *Tachyta*, and *Tachys*), and *Lymnastis*, Motsch.

The portion of Fauvel's Faune Gallo-Rhénane, Coléoptères, ii. [cf. Zool. Rec. xx. *Ins.* p. 17], published in 1884, only includes pp. 157-164 (*Nomius*, *Tachypus*, and *Cillenius*).

Bates, Biol. Centr. Am. Col. i. (1) pp. 288-292, notices varieties, &c., of his *Tachys diminutus* and *immaculatus* and *Bembidium vernalis* and *scintillaris*.

Geocharis masinissa and *cordubensis*, Dieck, recorded from Andalusia; Reitter, Wien. ent. Z. iii. p. 84.

Bembidium combustum, Mén., = *nobile*, Ratz.; *id.* Deutsche E. Z. xxviii. p. 42.

Petrocharis, g. n., Ehlers, Tr. Am. Ent. Soc. xi. p. 36. Allied to *Bembidium*. Type, *P. eggersii*, sp. n., *ibid.*, St. Thomas.

New species :—

Anillus dohrni, Ehlers, Tr. Am. Ent. Soc. xi. p. 36, Florida; *A. pallidus*, Broun, N. Z. J. Sci. ii. p. 228, New Zealand.

Tachys suturifer, Syria, and *pallidus*, Lenkoran, Reitter, Wien. ent. Z. iii. pp. 121 & 122; *T. limbatellus*, *insularum*, Panama, p. 288, *duplex*, Guatemala, and *gracilior*, Mexico, p. 289, Bates, Biol. Centr. Am. Col. i. (1); *T. litoralis* and *occultator*, Casey, Col. N. Am. pp. 15 & 69, New Jersey.

Barytachys glossema, Philadelphia, and *gemellus*, New Jersey, *id. t. c.* pp. 70 & 71.

Lymanastis narentinus, Reitter, *t. c.* p. 124, Narenta; *L. capito*, Bates, *t. c.* p. 287, Guatemala.

Xystosomus ampliatus, *id. t. c.* p. 293, Panama.

Pericompso quadrillum, Mexico, and *histrionellus*, pl. xiii. fig. 29, Panama, *id. ibid.*

Bembidion parnassium, Miller, Verh. z.-b. Wien, xxxiii. p. 264, Parnassus; *B. vinnulum*, Arizona, p. 15, *vernula*, New Jersey, p. 62, *acticola*, New Jersey, Delaware, p. 63, *militare*, Long Island, p. 65, *vividum*, New Jersey, p. 66, and *dejectum*, Arizona, p. 67, Casey, *t. c.*; *B. cyclodes*, p. 290, *ocularis*, Mexico, *vernale* and *satellites*, Panama, p. 291, Bates, *t. c.*

DYTISCIDÆ.

* SAHLBERG, J. Om skulptur-dimorphismen hos Dytiscidernas honor. Förh. vid. 12te Skand. Naturforskäremötet i Stockholm, 1880. Stockholm: 1883, pp. 533-538.

Haliphus japonicus (*frontalis* is a var.) and *leviventris* of Sharp, *rivalis*, Gyll., var. approaching *obesus*, Lec., and *Dytiscus sharpi*, Wehncke, noticed from Japan; Sharp, Tr. E. Soc. 1884, pp. 440-446.

Hyllroporus planus, Fabr., var. noticed; Fein, Z. E. Ver. schles. (2) ix. p. xxvi.

Lancetes varius, Fabr., discussed; Waterhouse, Ann. N. H. (5) xiii. p. 276.

Megadytes expositus, Sharp, = *Cybister australis*, Germ.; Berg, Bull. Soc. Ent. Fr. (6) iv. p. xcix.

Dytiscus marginalis, Linn., ♀ var. noticed; Czwalina, Deutsche E. Z. xxviii. p. 264.

Hydaticus amazonicus, Sharp, = *xanthomelas*, Brulle; Berg, Bull. Soc. Ent. Fr. (6) iv. p. c.

New species :—

Haliphus foveostriatus, Thomson, Opusc. Ent. x. p. 1030, Sweden; *H. ovalis*, Sharp, Tr. E. Soc. 1884, p. 440, Japan.

Bidessus frontalis, *id. ibid.*, Japan; *B. nigrinus*, Casey, Col. N. Am. p. 80, California.

Celambus vittatus, Sharp, *t. c.* p. 441, Japan.

Hydroporus fulviventris, Costa, Bull. Ent. Ital. xv. p. 332, Sardinia ;
H. natrix, Sharp, t. c. p. 443, Japan.

Deronectes anchoralis, simplicipes, p. 442, and *hostilis*, p. 443, *id. t. c.*,
 Japan.

Anisomera clauszi, Müller, Deutsche E. Z. xxviii. p. 417, South
 Georgia.

Rhantus erraticus, Sharp, t. c. p. 446, Japan.

Agabus insolitus and *optatus*, *id. t. c.* pp. 444 & 445, Japan ; *A. (Gau-
 rodytes) merkli*, Régimbart, Bull. Soc. Ent. Fr. (6) iv. p. xix., Bulgaria.

Gaurodytes callosus, Thomson, t. c. p. 1031, Sweden.

Platambus fimbriatus, Sharp, t. c. p. 445, Japan.

Copelatus japonicus, *id. ibid.*, Japan.

Trochalus seminitens, Fairmaire, CR. ent. Belg. xxviii. p. cxlii, Zan-
 zibar.

Acilius kotulæ, Ulanowskiego, Sprawozd. Kom. fizyogr. xviii. p. 6,
 Poland.

Hydaticus thermonectoides, Sharp, t. c. p. 447, Japan.

GYRINIDÆ.

RÉGIMBART, M. Essai monographique de la famille des Gyrinides. 3e
 partie. Ann. Soc. Ent. Fr. (6) iii. pp. 381-482, pls. xi.-xiv.

Includes the *Orectochilini*, the list of species, explanation of plates,
 &c. The following known species are redescribed and figured :—*Gyretes
 bidens*, Oliv., figs. 98 & 98a, *sericeus*, Lab., figs. 100 & 100a, *melanarius*,
 Aubé, figs. 101 & 101a, *dorsalis*, Brullé, fig. 102, *vulneratus*, Aubé, fig. 103,
glabratus, Rég., figs. 105 & 105a, *cinctus*, Germ., figs. 106 & 106a,
pygmaeus, Régimb., fig. 107, *nitidulus*, Lab., fig. 108, *parvulus*, Lab.,
levis, Brullé, fig. 115, *sinuatus*, Lec., *sallei*, Lab., fig. 109, *scaphidiformis*,
 Rég., *acutangulus*, Sharp, fig. 110, *morio*, Aubé, fig. 118, *proximus*, Sharp,
 fig. 112, *lionotus*, Aubé, figs. 113 & 113a, pl. xi., *boucardi*, Sharp, *Orecto-
 chilus validus*, Rég., figs. 122 & 122a, *b*, *semivestitus*, Guér., figs. 123 &
 123a, *ceylonicus*, Redt. (= *conspicuus*, Rég.), figs. 125 & 125a, *discifer*,
 Walk., *dilatatus*, Redt., fig. 126, *pubescens*, Rég., figs. 127 & 127a,
javanus, Aubé, figs. 129 & 129a, *angulatus*, Rég., fig. 128, *discus*, Aubé,
lucidus, Rég., fig. 131, *bipartitus*, Rég., fig. 132, *marginipennis*, Aubé (= *sub-
 sulcatus*, Rég.), figs. 133 & 133a, *b*, *pusillus*, Rég., *scalaris*, Rég., figs.
 134 & 134a, *ritsemæ*, Rég., fig. 135, *villosus*, Müll., *involvens*, Fald.,
gangeticus, Wiedm., figs. 137 & 137a, *spiniger*, Rég., fig. 139, *gestroi*, Rég.,
 fig. 140, pl. xii.

Gyrinus natator, Linn.: the following are probably synonymous:—
colymbus, Erichs., *distinctus* and *libanus*, Aubé, *caspicus*, Ménézes, *suf-
 friani*, Scriba, and *wankowitzi*, Régimb.; De Borre, CR. ent. Belg.
 xxviii. pp. clxvii.-clxx. *G. japonicus*, Sharp (= *curtus*, Régimb., nec
 Motsch.), noticed ; Sharp, Tr. E. Soc. 1884, pp. 447 & 448.

Orectogyrus, g. n., Régimbart, Ann. Soc. Ent. Fr. (6) iii. p. 439. Allied to
Orectochilus ; middle coxæ almost oval, outer part not even one and a half
 times narrower than the inner edge ; fifth joint of front tarsi one and a

half times or twice as long as the fourth. To include *O. speculum*, Aubé, fig. 146, *ornaticollis*, Aubé, fig. 149, *schœnherri*, Aubé, fig. 150, *cyanicollis*, Aubé, fig. 151, *gallicocinctus*, Fairmaire, fig. 152, *semisericeus*, Gestro, fig. 153, *dimidiatus*, Cast., fig. 156, *madagascariensis*, Aubé, fig. 158, *specularis*, Aubé, and var. *nudivittis*, Murr., fig. 159, pl. xiii., & fig. 160, *costatus*, Aubé, fig. 162, *schistaceus*, Gerst., fig. 163, *suturalis*, Rég., fig. 165, *glaucus*, Klug, fig. 166, *sericeus*, Klug, fig. 168, *angustior*, Kolbe, fig. 169, pl. xiv., *oscaris*, Apetz, and the following new species:—*O. lanceolatus*, fig. 144, Natal, p. 440, *mirabilis*, fig. 145, S. Africa, p. 141, *dorsiger*, fig. 147, Natal, p. 443, *sedilloti*, fig. 148, Madagascar, p. 444, *lionotus*, fig. 154, p. 449, *trilobatus*, both from W. Africa and Mauritius, p. 450, *tridens*, Egypt, p. 451, *heros*, fig. 157, pl. xiii., Madagascar, p. 453, *conformis*, fig. 161, Caffraria, p. 456, *assimilis*, fig. 164, Angola, p. 458, *cuprifer*, Africa, *bedeli*, fig. 167, Gold Coast, p. 462, *oberthueri*, fig. 170, p. 465, and *longitarsis*, Madagascar, fig. 171, pl. xiv. p. 466; add *O. polli*, sp. n., *id.* Notes Leyd. Mus. vi. p. 165, Transvaal.

New species:—

Gyrinus dimorphus, Régimbart, Ann. Soc. Ent. Fr. (6) iii. p. 474, Mexico.

Dineutes fauveli, *id.* t. c. p. 470, W. Africa.

Gyretes suturalis, figs. 97 & 97a, Brazil or Guiana (?), p. 386, *sexualis*, fig. 98, Cayenne, Amazons, p. 388, *sharpi*, Santa Cruz, p. 391, *cubensis*, fig. 104, Cuba, p. 392, *bolivari*, Ecuador, p. 395, *oblongus*, Mato-Grosso, *tumidus*, Goyaz, p. 396, *guatemalensis* (= *levis*, Sharp, nec Brullé), Guatemala, p. 399, *venezuelensis*, figs. 111 & 111a, b, Venezuela, p. 403, *mexicanus*, fig. 119, Mexico, p. 405, *minor*, figs. 114 & 114a, Guatemala, p. 407, *meridionalis*, fig. 116, Montevideo, p. 408, and *angustatus*, fig. 117, Brazil, *id.* t. c. pl. xi.

Orectochilus crassipes, fig. 120, *corpulentus*, fig. 121, Borneo, p. 411, *wehnckei*, fig. 124, Ceylon, p. 414, *procerus*, Cochin China, p. 415, *fraternus*, fig. 142, Ceylon, p. 417, *metallicus*, fig. 143, India, p. 418, *productus*, fig. 130, India, S. China, Borneo, p. 422, *oberthueri*, Philippines, p. 423, *pulchellus*, Philippines, Timor, *limbatus*, East Indies, p. 424, *sculpturatus*, Hong Kong, p. 425, *rivularis*, Cochin China, p. 427, *fairmairei*, fig. 135, Ceylon, p. 428, *indicus*, fig. 141, India, and *andamanicus*, fig. 138, Andaman Islands, p. 435, *id.* t. c. pl. xii.; *O. regimbarti*, p. 448, *agilis* and *punctipennis*, p. 450. Sharp, Tr. E. Soc. 1884, Japan.

HYDROPHILIDÆ.

CAMERANO, L. Monografia degli Idrofilini Italiani. Atti Acc. Tor. xix. pp. 270-287, pl. (Cf. also Bull. Ent. Ital. xvi. pp. 88-91.)

Includes *Hydrophilus piceus*, Linn., *pistaceus*, Cast., *aterrimus*, Esch., *Hydrochara caraboides*, Linn., cum varr. *intermedia*, Muls., and *scrobiculata*, Panz., and *H. flavipes*, Stev.

SHARP, D. Revision of the *Hydrophilidæ* of New Zealand. Tr. E. Soc. 1883, pp. 465-480.

24 species, belonging to 12 genera, are recorded and tabulated. The

1884. [VOL. XXI.]

following known species are specially noticed :—*Hydrobius assimilis*, Hope (= *zealandicus*, Broun), *Paracymus nitidiusculus*, Broun, *Rygmodus*, White, recharacterized, and *R. modestus*, White (for which *R. pedinoides*, White, *incertus*, *opimus*, and *cyaneus*, Broun, are probably varieties), redescribed; *Philydrus variolorum*, Broun, *Cyclonotum marginale*, Sharpe, and *Cercyon flavipes*, Fabr.

Fowler, Ent. xvii. pp. 54–59 & 156–163, discusses the British species of *Cercyon*, *Megasternum*, *Cryptopleurum*, *Hydrobius*, *Ochthebius*, and *Hydrena*.

Limnoxenus, Motsch., and *Empleurus*, Hope, are good genera, and *Hydrophilus pistaceus*, Lap., is distinct from *piceus*, Linn.; Rey, Rev. d'Ent. iii. pp. 266–268.

Hydrocharis affinis, Sharp (= *flavipes* var., Sharp, nec Steph.), *Sternolophus rufipes*, Fabr. (= *fulvipes*, Lewis, nec Motsch.), *Cyclonotum orbiculare*, Fabr., *Cercyon sharpi*, Har., *unipunctata*, Linn., *Oosternum sores*, Sharp, and *Pachysternum hamorrhoum*, Motsch., noticed from Japan; Sharp, Tr. E. Soc. 1884, pp. 450–462.

Hydrophilus aterrimus, Esch., var. *barbatus* from Trachenberg described; Letzner, JB. schles. Ges. lxi. pp. 301 & 302. *H. medius*, Brullé, belongs to *Hydrocharis*; Berg, Bull. Soc. Ent. Fr. (6) iv. p. c.

Hydrobius fuscipes, Linn., noticed; Thomson, Bull. Soc. Ent. Fr. (6) iii. p. cxxxi. *H. picicrus*, Thoms. (? = *subrotundus*, Steph.), only doubtfully distinct; Sharp, Ent. M. M. xxi. pp. 84 & 85.

Laccobius, Erichs. Synopsis of British species; *id. t. c.* pp. 85 & 86 (cf. also Wood, pp. 112 & 113).

Cyprimorphus compressus, Fairm., = *Amphiops globus*, Erichs.; Fairmaire, Bull. Soc. Ent. Fr. (6) iv. p. xlv.

Helophorus crenatus, Rey, noticed; Fowler, Ent. M. M. xxi. pp. 161 & 162.

Paracymus æneus of British authors (nec Gyll.) = *nigroæneus*, Sahlb.; Sharp, Ent. M. M. xxi. p. 112.

New genera and species :—

Hydrocycclus, Sharp, Tr. E. Soc. 1884, p. 451. Allied to *Hydrobius*; palpi elongate, hind tarsi pubescent beneath. Type, *H. lacustris*, sp. n., *ibid.*, Japan.

Peratogonus, *id. t. c.* p. 461. May be placed between *Oosternum* and *Deltostethus*. Type, *P. reversus*, sp. n., *ibid.*, Nagasaki.

Saphydrus, *id. t. c.* p. 467. Allied to *Hydrobius*, and also to *Anacæna* and *Rygmodus*, but with the appearance and colouration of convex species of *Philydrus*. To include *S. suffusus*, p. 468, *obesus*, *antennatus*, and *longulus*, p. 469, spp. nn., *t. c.*, New Zealand.

Tormus, *id. t. c.* p. 474. Allied to *Derus*; antennæ 9-segmented and the joint preceding the club simple. Type, *T. helmsi*, sp. n., *ibid.*, New Zealand.

Hydrostygnum, *id. t. c.* p. 475. Allied to *Saphydrus* and *Rygmodus*, but resembling *Cyclonotum*. To include *H. browni* and *linsi*, spp. nn., *t. c.* pp. 475 & 476, New Zealand.

Adolopus, *id. t. c.* p. 478. Differs from *Cyclonotum* by the basal joint

of the hind tarsi being shorter than the second. To include *A. helmsi*, sp. n., *ibid.*, New Zealand, and *Cyloma altulum*, Broun.

Phelerosus, Sharp, t. c. p. 480. Allied to *Berosus*; hind femora pubescent only where they touch the coxæ; side pieces of prosternum less prolonged inwardly, and prothorax slightly impressed in the middle. Type, *P. pallidipennis*, sp. n., *ibid.*, New Zealand.

Hydrocharis libera, *id.* t. c. p. 450, Hakodate.

Hydrobius picicrus, Thomson, Bull. Soc. Ent. Fr. (6) iii. p. cxxxi., France; *H. pauper*, Sharp, t. c. p. 452, Japan.

Philydrus fuscipennis, Thomson, Opusc. Ent. p. 1031, Sweden; *P. angustulus*, Casey, Col. N. Am. p. 83, New Jersey; *P. haroldi* (? = *cinctus*, Har.), p. 452, *uniformis*, *vilis*, p. 453, *ornaticeps*, and *umbratus*, p. 454, and *abditus*, p. 473, Sharp, t. c., Japan.

Paracymus relaxus, Rey, Rev. d'Ent. iii. p. 267, Biskra.

Laccobius cupreus, Corsica, and *densatus*, Dauria, *id.* *ibid.*; *L. bedeli* and *oscillans*, Sharp, t. c. p. 455, Japan.

Berosus vestitus, *id.* t. c. p. 456, Japan.

Limnebius perparvulus and *subglaber*, Rey, t. c. p. 268, Corsica.

Amphiops pisiformis, Fairmaire, Bull. Soc. Ent. Fr. (6) iv. p. xli., Cambodia.

Helophorus crenatus, England, and *cognatus*, Bône, Rey, t. c. p. 268; *H. angustulatus*, Sharp, t. c. p. 464, Japan; *H. pallens*, Casey, t. c. p. 81, Arizona.

Ochthebius detritus, *trisulcatus*, and *parvulus*, Rey, t. c. p. 269, Biskra, &c.; *O. inermis*, Sharp, t. c. p. 456, Japan.

Hydrochus æqualis, *id.* t. c. p. 457, Japan.

Hydræna bisulcata, Andalusia, *hungarica*, Hungary, *subacuminata*, *evanescens*, p. 270, and *reflexa*, Corsica, p. 271, Rey, t. c.

Cercyon setulosus, p. 458, *vagus*, *placidus*, *æqualis*, p. 459, *rotundulus*, and *rubicundus*, p. 460, Sharp, t. c., Japan.

Cryptopleurum subtile (= *atomarium* var., Sharp), *id.* t. c. p. 461, Japan.

Rygmodes femoratus, p. 471, *unguicularis* and *ovalis*, p. 472, *id.* t. c., New Zealand.

Cyloma thomsonus and *guttulatus*, *id.* t. c. p. 477, New Zealand.

PLATYPSYLLIDÆ.

Platypsylla castoris, Rits. This species, which has recently occurred in France, is fully redescribed and figured by Bonhoure, who also notices the opinions of various authors relative to its affinities; Ann. Soc. Ent. Fr. (6) iv. pp. 147—154, pl. vi. (cf. also Reitter, *Wien. Ent. Z.* iii. pp. 19—21, and Ritsema, *Tidjschr. Ent.* xxvii. pp. lxxxv.—lxxxvii.).

STAPHYLINIDÆ.

ARRIBÁLZAGA, F. L. Estafilinos de Buenos Aires. Bol. Ac. Cordoba, vii. pp. 5—392.

An elaborate monograph. Several new genera and species are described.

QUEDENFELDT, M. Beiträge zur F., Michigan, p. 112, *carolinæ*, Southern Süd-Spanien, Portugal, und ^{superior}, p. 117, *minor*, Michigan, p. 118 & 351-379.

Includes lists of 227 species (23 new), with localities and occasional remarks.

SHARP, D. Biologia Centrali-Americana. [Vide Godman and Salvin : INSECTA, General Subject.] *Coleoptera*, i. (2) pp. 313-392, pls. viii. & ix.

Includes *Staphylinidæ* from *Conosoma* to *Orthostygnus*.

List of *Brachelytra* of the Liverpool district; Ellis, Naturalist (2) x. pp. 45-57.

Additions to list of *Staphylinidæ* collected by Montandon in Moldavia, Wallachia, and the Dobrudscha; Fauvel, Rev. d'Ent. iii. p. 292.

Aleocharides.

The following known species of *Aleocharini* are fully redescribed by Arribáizaga (Bol. Ac. Cordoba, vii. pp. 27-100):—*Ophioglossa cava*, Sharp, *Falagria venustula*, Er., *Colpodita (Hemitropia) melanaria*, Sahlb. (= *Homalota livida* and *lividipennis*, Ev., *fulvipennis*, Kol, and *squalidipennis*, Fairm. & Germ.), *Aleochara fuscipes*, Fabr. (= *Staphylinus brachypterus*, Fourcr., *Aleochara lata*, Grav., *A. histrica*, Say, *A. atra*, Fairm. & Germ., and *Mecorhopalus ater*, Sol.), *Baryodma (Polychara) verberans*, Er., *B. (Coprochara) notula*, Er., *B. (C.) duplicata*, Er., *Oligota apiciventris*, Fairm. & Germ., *Myllena parvicollis*, Kraatz (= *dilatipes* and *ferrugata*, Fairm. & Germ.).

Falagria gratilla, Erichs., noticed; Ragusa, Nat. Sicil. iii. p. 317.

Apteranillus convexifrons, Fairm. (? = *dohrnii*, Fairm.), discussed; Quedenfeldt, B. E. Z. xxviii. pp. 352 & 379.

New genera and species:—

Oligonotus, Arribáizaga, Bol. Ac. Cordoba, vii. p. 89. Allied to *Actosus* and *Arena*. Type, *O. exiguus*, sp. n., t. c. p. 91, Buenos Aires.

Campoporus, id. t. c. p. 64. Allied to *Euryusa*. Type, *C. elegantulus*, sp. n., t. c. p. 66, Buenos Aires.

Tithanis, Casey, Col. N. Am. p. 16. Allied to *Aleochara*, but mesosternum with no mesial ridge between the coxæ. Type, *A. valida*, Lec.

Emplenota, id. t. c. pp. 17 & 120. Resembles both *Aleochara* and *Homalota*. Type, *E. maritima*, sp. n., t. c., New Jersey, Virginia.

Myrmecozenia, Arribáizaga, t. c. p. 35. Allied to *Orphnebius*. Type, *M. pampeana*, sp. n., t. c. p. 37, Buenos Aires.

Heterophena, id. t. c. p. 45. Allied to *Homalota*. Type, *H. palliditarsis*, sp. n., t. c. p. 49, Buenos Aires.

Cryptocompsus, id. t. c. p. 96. Affinities uncertain; may be placed provisionally near *Oligota*. Type, *C. venustus*, sp. n., t. c. p. 97, Buenos Aires.

Echidnoglossa ventricosa, Quedenfeldt, B. E. Z. xxviii. p. 364, Algesiras, Cordova, Morocco; *E. paulinoi*, Skalitzy, Wien. ent. Z. iii. p. 97, Portugal.

Hungary, Croatia, Astrakhan; *C. rosti* (Fauv., MS.), Arribáizaga, Bol. Ac. p. 105, Corfu; *C. weberi*, Morocco, and *C. weberi*, Hungary, MS.).

Leptusa rufescens, Eppelsheim, Verh. Ver. Brünn, xxii. p. 11, Lirík; *L. affinis*, Patras, and *ehlersi*, Sierra d'España, *id.* Deutsche E. Z. xxviii. pp. 42 & 357; *L. (?) dubia*, Arribáizaga, *t. c.* pp. 88, Buenos Aires.

Aleochara diversicornis, Eppelsheim, Verh. Ver. Brünn, xxii. p. 11, Lenkoran; *A. bonariensis*, Arribáizaga, *t. c.* p. 70, Buenos Aires.

Lomechusa teres, Eppelsheim, *t. c.* p. 11, Kasbek.

Myrmedonia cinctipennis, *id.* *t. c.* p. 12, Talysch; *M. ehlersi*, *id.* B. E. Z. xxviii. p. 365, Morocco; *M. argentina* (Fauv., MS.) and *basalis*, Arribáizaga, *t. c.* pp. 41 & 44, Buenos Aires.

Drusilla (?) extranea, *id.* *t. c.* p. 33, Buenos Aires.

Calodera nitidula, *id.* *t. c.* p. 36, Buenos Aires.

Oxyptoda erythroceræ, Lirík, and *caspia*, Lenkoran, Eppelsheim, Verh. Ver. Brünn, xxii. pp. 12 & 13; *O. triangulum*, Tangiers, and *O. (Bacoglana) incerta*, Algesiras, *id.* B. E. Z. xxviii. pp. 369 & 370.

Microdota bonariensis and *M. (?) decolorata*, Arribáizaga, *t. c.* pp. 51 & 53, Buenos Aires.

Homalota minuta, *id.* *t. c.* p. 57, Buenos Aires; *H. meludyi*, Quedenfeldt, B. E. Z. xxviii. p. 366, Morocco; *H. chyzeri*, Eppelsheim, in Biro's Col. coll. Chyzer [cf. *antea*,] p. 14, p. 15, Hungary; *H. (Sipalia) quedenfeldti*, Eppelsheim, B. E. Z. xxviii. p. 367, Tangiers; *H. (Aleuonota) mirabilis*, *id.* Verh. Ver. Brünn, xxii. p. 13, Lirík; *H. (Meotica) anophthalma* and *H. (Acrotona) hæmatica*, *id.* Deutsche E. Z. xxviii. pp. 358 & 359, Sierra d'España.

Thectura tricuspis, *id.* *t. c.* p. 43, Morea.

Ilyobates crassicornis, Quedenfeldt, B. E. Z. xxviii. p. 366, Morocco.

Phleopora scribae, Eppelsheim, *t. c.* p. 169, Wimpfen.

Tomoglossa leta, *id.* B. E. Z. xxviii. p. 369, River Issil and Cape Verd.

Tachyporides.

Myotyphlus, Fauv., renamed *Cryptommatus*, and fully characterized; Matthews, Cist. Ent. iii. p. 88. Type, *Amblyopinus jansoni*, Matth., redescribed and figured, *t. c.* p. 91, pl. v. fig. 10.

Amblyopinus jelskii, Sauley. Genus and species redescribed and figured; *id.* *t. c.* pp. 92-97, pl. v. figs. 1-9.

Conosoma testaceum, Sol. (= *Tachyporus maculipennis*, Sol., *Conurus obscuripennis*, Fairm. & Germ., and *setosus*, Sharp), redescribed, and many varieties noticed; Arribáizaga, Bol. Ac. Cordoba, vii. pp. 106-108.

New species:—

Erchomus flavidus, Casey, Col. N. Am. p. 141, Philadelphia; *E. pallidus*, Arribáizaga, Bol. Ac. Cordoba, vii. p. 108, Buenos Aires.

Coproporus (?) pumilio, Eppelsheim, Verh. Ver. Brünn, xxii. p. 13, Lenkoran.

Conurus nigropictus, *id.* *ibid.*, Lirík; *C. versicolor*, Philadelphia, p. 142, *imbricatus*, New York, p. 143, *occultus*, Columbia, p. 145, *corticola*, p. 146, and *setifer*, Philadelphia, p. 147, Casey, *t. c.*

Conosoma gravidum, fig. 14, Panama, *plebeum*, Guatemala, p. 313,

mediale, Guatemala, Panama, *pumilia*, pp. 185 & 203. * *Batrissodes*, p. 205. pl. vii., Guatemala, Panama, *subcylus*, pp. 189 & 206. *Briara* (= *Gona-* and *diffine*, Guatemala, p. 316, Sharp, Biol. Centr. Am. Col. i. (2).
Bolitobius festivus, fig. 16, Guatemala, Panama, p. 316, *obliquus*, fig. 17, pl. vii., Mexico, and *alticola*, Guatemala, p. 317, id. t. c.; *B. facilis*, Philadelphia, Columbia, and *occiduus*, Washington Territory, Casey, t. c. pp. 148 & 150.

Bryocharis pulchella, Arribáizaga, t. c. p. 104, Buenos Aires.

Megagronus oscillans, Guatemala, *nigerrimus*, fig. 18, *acuminatus*, Panama, p. 318, *meridionalis*, fig. 19, pl. vii., Guatemala, Panama, *regularis*, Guatemala, p. 319, and *minor*, Guatemala, p. 320, Sharp, t. c.

Bryoporus parvulus, Casey, t. c. p. 151, Philadelphia; *B. vittatus*, Eppelsheim, t. c. p. 14, Kasbek.

Mycetoporus inquisitus, Casey, t. c. p. 152, Philadelphia; *M. coxalis*, Sharp, t. c. p. 320, pl. vii. fig. 20, Panama.

Staphylinides.

HORN, G. H. Synopsis of the Philonthi of North America. Tr. Am. Ent. Soc. xi. pp. 177-244.

Deals with the genera *Philonthus*, Curt. (divided into 5 sections by the punctuation, and the structure of the anterior tarsi), *Actobius*, Fauv., and *Cafius*, Steph. The following synonymy occurs:—*P. aeneus*, Rossi (= *politus* and *mandibularis*, Kirby, and *harrisi*, Mels.), *furvus*, Nordm. (= *californicus*, Mannerh., and *comptus*, Hald.), *hepaticus*, Erichs. (? = *varicolor*, Boh.), *unbrinus*, Grav. (= *mæstus*, Grav.), *varians*, Payk. (= *varicolor*, Boh.), *niger*, Melsh.), *longicornis*, Steph. (= *scybalarius*, Nordm., and *promptus*, Erichs.), *discoideus*, Grav. (= *ruficornis*, Melsh.) *lomatus*, Erichs. (= *georgianus*, Sachse), *brunneus*, Grav. (= *sericans*, Grav., *dimidiatus*, Say, and *brevis*, Melsh.), *cyanipennis*, Fabr. (= *cæruleipennis*, Mannerh.), *blandus*, Grav. (= *pulchellus*, Melsh., and *pæderinus*, Sachse), *ventralis*, Grav. (= *anthrac*, Grav.), *nigritulus*, Grav. (= *aterri-* *mus*, Grav., *picipennis*, Mäkl., and *pumilus*, Maun.), *apicalis*, Say (= *hematurus*, Erichs.), *Cafius femoralis*, Mäkl. (= *mutatus*, Gemm. & Har.), and *opacus*, Lec. (= *dubius*, Lec.).

Sharp, Biol. Centr. Am. Col. i. (2) pp. 340-385, notices the following known species:—*Cyrtothorax buphthalmus*, Erichs. (= *Bolitogyrrus cribripennis*, Dej., and *C. sallasi*, Kraatz), *Cordylaspis pilosa*, Fabr. (= *Smilax americanus* and *C. tuberculatus*, Nordm.), var. figured, pl. viii. fig. 12; *Euryporus puncticollis*, Erichs., belongs to *Tympanophorus*; *Selma modesta*, Sharp (figured, pl. viii. fig. 14), *Xanthopygus sapphirinus* and *Philothalpus segmentarius*, Erichs., *Schizochilus versicolor*, Grav. (= *S. brasiliensis*, Gray, and *Staphylinus infuscatus*, Nordm.), *Staphylinus fulvomaculatus*, *ferox*, and *atrox*, Nordm., pl. ix. figs. 13-15, *caliginosus*, *sepulchralis*, Erichs., *maculosus*, Grav., var., *fuscomaculatus*, Lap., *affinis*, Solsky, and *antiquus*, Nordm.

The following known species of *Staphylini* are redescribed by Arribáizaga, Bol. Ac. Arg. vii. pp. 116-195:—*Hæmatodes bicolor*, Cast. (= *Platytoma hæmatodes*, Dej., and *Platynemus lateritius*, Nordm.), *Scariphæus*

Type (from S. America) not named; but *is*, Dej., *Xanthopygus herilis*, Raffr., is congeneric.

Reitter, Verh. Ent. Ver. Münch., 1877, p. 117. *is*, Dej., *Xanthopygus herilis*, Nordm., *scabrosus*, Curt., *nigrescens*, Blanch., and ? *sepulchralis*, Steinh.), *sepulchralis*, Erichs., *Philonthus* (species tabulated). *P. tenebrosus*, *quad-ruticeps*, Boh., *rubromaculatus*, Blanch., *palli[di]pes*, Blanch. (= *depressus*, Steinh.), and *hepaticus*, Erichs. (= *nanus* and *palleolus*, Melsh., and *pauzillus*, Solsky), *Diachus nanus*, Erichs., *Xanthopinus* (species tabulated), *X. (Megalinus) lubricus*, Erichs., *X. (M.) castanopterus*, Erichs., *X. (Gyrophypus) andinus*, Fauv., *X. (G.) bomariensis*, Germ. & Har. (= *gracilis*, Boh.), *X. (G. ?) subtilis*, Boh., and *Lithocharodes fustipennis*, Sharp.

Quedius fulgidus var. *erythrogaster*, Mannerh., noticed; Weise, Deutsche E. Z. xxviii. p. 423.

Velleius dilatatus, Fabr., noticed: Bargagli, Bull. Ent. Ital. xvi. p. 92; Everts, Tijdschr. Ent. xxvii. pp. lxxxviii.-cxi.

Leistotrophus murinus, L., var. *haroldi* from Munich described; Eppelsheim, Deutsche E. Z. xxviii. p. 170.

Philonthus addendus, Sharp, differs from *tenuicornis*, Rey (= *carbomarius*, Gyll.), in the same way that *P. corruscus* differs from *P. ebeninus*; Fuss, Deutsche E. Z. xxviii. p. 176. *P. dives*, Erichs., redescribed, and *pretiosus*, Er., ♀ (?) noticed; Dohrn, S. E. Z. xlv. pp. 181-184 & 283.

Xantholinus linearis, Oliv., var. *maghrebinus* from Morocco described; Quedenfeldt, B. E. Z. xxviii. p. 376.

Platyprosoparia, sect. n., Arribalzaga, Bol. Ac. Arg. vii. p. 165. Intermediate between the *Staphylinini* and *Xantholinini*. To contain the genus *Platyprosopus*, Mannerh.

New genera and species :—

Mimosticus, Sharp, Biol. Centr. Am. Col. i. (2) p. 327. Allied to *Quediopsis*, but the four basal joints of anterior tarsi dilated and maxillary palpi longer. Type, *M. viridipennis*, sp. n., t. c. p. 128, pl. viii. fig. 2.

Quedionuchus, id. t. c. p. 336. Allied to *Quedius*, but somewhat approaching *Philonthus*. To include *Staphylinus lavigatus*, Gyll., some undescribed Japanese species, *Quedius impunctus*, Solsky (redescribed, t. c.), and *Q. spinipes*, Guatemala, Mexico, p. 337, *femoralis*, *angustus*, and *nigerrimus*, pl. viii. fig. 8, Guatemala, p. 338, spp. nn.

Quediomacrus, id. t. c. p. 339. Allied to *Quedius*; hind tarsi short, broad and rigid, each joint bearing on the under surface a series of rigid adpressed ciliæ. To include *Q. paniceipennis*, Solsky (figured, pl. viii. fig. 9), and *Q. pollens*, sp. n., t. c., Guatemala.

Diaphocis, Waterhouse, P. Z. S. 1884, p. 213. Allied to *Staphylinus*, but head smaller. Type, *D. rugosus*, sp. n., t. c. p. 214, pl. xvi. fig. 1, Larat.

Lampropygus, Sharp, t. c. p. 346. Allied to *Xanthopygus*, but ligula less emarginated, and the plane surface of the front margin of the thorax at the anterior angles much diminished. To include *Staphylinus xanthopygus*, Nordm. (= *Xanthopygus abdominalis*, Har.), *cognatus*, Sharp

(= *xanthopygus*, Erichs. & Sahlb., pp. 185 & 203. * *Butrisodes*, p. 205. pl. viii. fig. 18), and *P. bicolor*, Erichs. & Sahlb., pp. 185 & 206. *Briara* (= *Gona-*

Styngetus, Sharp, t. c. p. 361. Differs from *Philonthus* by the front tarsi being simple in both sexes, destitute of fine pubescence beneath, and by the elongate trophi. To include *Philonthus cupripennis* and *antennatus*, Guér., *Philonthus deyrollei*, Solsky, *viduus*, Erichs. (var. figured, pl. ix. fig. 4), and *flavicaudus*, p. 361, *championi*, Guatemala, and *anticus*, pl. ix. fig. 5, Costa Rica, Panama, p. 362, spp. nn.

Ocyolinus, id. t. c. p. 362. Placed after *Styngetus*. To include *O. amethystinus*, pl. ix. fig. 6, Costa Rica, and *rugatus*, Venezuela, spp. nn., t. c. p. 363, and note.

Phanolinus, id. t. c. p. 363. (*Trigonophorus*, p. Kraatz.) To include *Philonthus pretiosus*, Erichs., *amœnus*, *cyanescens*, and *cupreus*, Guér., *Trigonopselaphus violaceus* and *venustus*, Sharp, and *P. obsoletus*, *flohri*, fig. 7, Mexico, p. 364, *divisus*, Panama, *gravidus*, Guatemala, *pollens*, Nicaragua, p. 365, *auratus*, Guatemala, *godmani*, fig. 8, Guatemala, Panama, p. 366, *longulus*, Nicaragua, *punctatus*, Panama, *speciosus*, fig. 9, Mexico, p. 367, and *discedens*, fig. 10, pl. ix., Panama, p. 368, spp. nn., t. c.

Nausicotus, id. t. c. p. 368. Allied to *Phanolinus*. To include *Trigonopselaphus opacipennis*, Sharp, and *N. spectabilis*, sp. n., t. c. p. 369, pl. ix. fig. 11, Nicaragua.

Amichorus, id. t. c. p. 390. Intermediate between *Staphylinus* and *Philonthus*. To include *A. fauveli*, pl. ix. fig. 26, *cyaneus*, Mexico, p. 390, and *viduidus*, Panama, p. 391, spp. nn.

Flohria, id. t. c. p. 391. Placed provisionally between *Philonthus* and *Ocybus*. Type, *F. laticornis*, sp. n., t. c. p. 392, pl. ix. fig. 27, Mexico.

Onthostygnus, id. t. c. p. 392. Allied to *Hesperus*. Type, *O. fasciatus*, sp. n., *ibid.* pl. x. fig. 1, Mexico.

Tanygnathus antennalis, fig. 21, Guatemala, *muticus*, Guatemala, Panama, p. 321, *vilis*, fig. 22, pl. vii., Guatemala, Panama, and *crassulus*, Nicaragua, p. 322, Sharp, Biol. Centr. Am. Col. i. (2).

Acylophorus didymus, pl. vii. fig. 25, *proximus*, Guatemala, *simplex*, Mexico, p. 325, *mexicanus*, Mexico, *parviceps*, Guatemala, *chontalensis*, Nicaragua, p. 326, *palpalis*, pl. viii. fig. 1, Guatemala, and *planatus*, Nicaragua, p. 327, id. t. c.

Euryporus flavipes, Fauvel, Notes Leyd. Mus. vi. p. 241, Sumatra.

Heterothops remota, fig. 23, Mexico, Panama, *insolita*, Guatemala, p. 323, *orbicularis*, fig. 24, pl. vii., Guatemala, Panama, and *tenuicornis*, Guatemala, p. 324, Sharp, t. c.; *H. bonariensis* and *fallax*, Arribáizaga, Bol. Ac. Cordoba, vii. pp. 123 & 124, Buenos Aires.

Cyrtothorax bullatus, Panama, p. 340, *cyanescens*, pl. viii. fig. 10, Guatemala, *fulgidus*, Nicaragua, and *salvini*, Guatemala, p. 341, Sharp, t. c.

Quedius silvicola, Casey, Col. N. Am. p. 123, Philadelphia; *Q. iridicolor*, Morocco, and *eppelsheimi*, Algesiras, Quedenfeldt, B. E. Z. xxxviii. pp. 371 & 372; *Q. advena*, Mexico, *laticulus*, fig. 3, Panama, *championi*, fig. 4, Guatemala, p. 329, *illatus*, Mexico, Guatemala, Panama, *basiventris*, fig. 5, Guatemala, Panama, p. 330, *jocosus*, fig. 6, Guatemala, *graciliventris*, Panama, p. 331, *concolor*, Guatemala, p. 332, *arrogans*, fig. 7,

Territory, British Columbia, Canada, *in* *pa*, pp. 185 & 203. * *Butrisodes*, p. 205. Colorado, p. 239, Horn, Tr. Am. *sub*, pp. 189 & 206. *Eriara* (= *Gona-*

Actobius nanus, Canada, Michigan, *Rica*, *Dicentr*, *in* *st*, *in* *ut*, Michigan, New England States, p. 225, *fraterculus*, Northern Illinois, Michigan, *senilis*, Colorado, Nevada, California, p. 226, *infimus*, California, p. 227, *ocreatus*, California, p. 228, *patella*, Michigan, New York, *lozatus*, Columbia, p. 229, *puncticeps*, California, *parcus*, Michigan to Columbia, *pusio*, Colorado, p. 230, *jocosus*, Delaware, N. Carolina, *jucundus*, S. Carolina, and *elegantulus*, Southern California, Arizona, p. 232, *id. t. c.*

Cafius seminitens and *luteipennis*, *id. t. c.* pp. 236 & 237, California.

Belonuchus moquinus, Casey, *t. c.* p. 125, Arizona.

Trigonopselaphus staphylinoides (Fauv., MS.), Antequera and Chacabuco, and *castaneipennis*, Chacabuco, Arribáizaga, *t. c.* pp. 141 & 144.

Tympanophorus concolor, Sharp, *t. c.* p. 343, pl. viii. fig. 13, Costa Rica.

Xanthopygus slohri, Mexico, Guatemala, *puncticollis*, fig. 15, Panama, p. 345, *morosus*, Mexico, Guatemala, and *rufipennis*, fig. 16, pl. viii., Mexico, Panama, p. 346, *id. t. c.*; *X. (?) oliveiræ*, Arribáizaga, *t. c.* p. 132, Arrecifes.

Brachydirus terminalis, Guatemala, p. 348, *divisus*, fig. 19, Panama, *gracilis*, Nicaragua, p. 349, *solitarius*, Nicaragua, *championi*, Guatemala, p. 350, and *fungicola*, fig. 20, pl. viii., Panama, p. 351, Sharp, *t. c.*

Plociopterus varipes, Guatemala, Capetillo, p. 351, *collaris*, fig. 21, *lugubris*, p. 352, *mollis*, Panama, *histrio*, Nicaragua, *variegatus*, fig. 22, pl. viii., Panama, p. 353, and *belti*, Nicaragua, p. 354, *id. t. c.*

Philothalpus difficilis, fig. 23, Guatemala, Nicaragua, *debilis*, Panama, p. 355, *nigriventris*, *pectoralis*, Guatemala, p. 356, *prolixus*, fig. 24, Panama, *mexicanus*, Mexico, Guatemala, *tinctiventris*, Guatemala, p. 357, *subtilis*, Mexico, *chiriquensis*, *philonthiformis*, fig. 25, pl. viii., Panama, p. 358, *pæderiformis*, pl. ix. fig. 1, Mexico, p. 359, *id. t. c.*

Gastrisus opaculus, pl. ix. fig. 2, Panama, and *mimetes*, Costa Rica, *id. t. c.* pp. 359 & 360.

Isanopus sallæi, *id. t. c.* p. 360, pl. ix. fig. 3, Mexico.

Xantholinus (Eulissus) azureus, Argentine Republic, Uruguay, p. 179, *X. (Megalinus) pampeanus*, p. 185, and *X. (M.) subaequalis*, Buenos Aires, p. 187, Arribáizaga, *t. c.*; *X. fucosus*, Casey, *t. c.* p. 126, New Jersey.

Othius pilifer and *paralleiceps*, Quedenfeldt, *t. c.* p. 375, Morocco.

Platyprosopus bucephalus (Fauv., MS.), Arribáizaga, *t. c.* p. 168, Buenos Aires and Missiones

Pæderides.

The following known species of *Pæderini* and *Pinophilini* are re-described in full by Arribáizaga, Bol. Ac. Arg. vii. pp. 197-327: *Cryptobium* (species tabulated), *C. basale*, Blanch., *Lathrobium* (species tabulated), *L. dimidiatum*, Say (= *rufopartitum*, Fairm. & Germ.), *nitidum*, Erichs., *Scopaeus angustatus*, Sol., and *Lithocharis ochracea*, Grav. (= *rubricollis*, Grav., *ochracea*, Boisd. & Lac., *lurida*, Sturm, *brunniceps* and

Morea ; *S. latiusculus*, Casey, *Ins.*, pp. 185 & 203. * *Butrisoden*, p. 205.
elegans, Arribáizaga, *t. c.* p. 273. *Briara* (= *Gona-*
Scopæus lugubris, Buenos Aires, *Rev. Stenini*, *id.* *t. c.* pp. 248
 & 250.

Echiaster rugulosus, *id.* *t. c.* p. 281, Buenos Aires.

Lithocharis tabacina (Fauv., MS.), Casey, Bull. Brooklyn Soc. vii.
 p. 65, United States ; *L. atricapilla*, Arribáizaga, *t. c.* p. 255, Chacabuco.

Sunius paranensis (Fauv., MS.), *id.* *t. c.* p. 299, Buenos Aires.

Pæderus pelikani, Reitter, Wien. ent. Z. iii. p. 44, Corfu, Zante, Cepha-
 lonia, Morea [*P. baudii*, Fairm. (= *lusitanicus*, Baudi, *ventricosus*, Gaut.),
 described for comparison, *t. c.* p. 43] ; *P. bonariensis*, Arribáizaga, *t. c.*
 p. 294, Buenos Aires.

Palaminus bonariensis, *id.* *t. c.* p. 329, Buenos Aires.

Pinophilus subtilis, p. 313, *robustus*, Buenos Aires, p. 321, and *bergii*,
 Monte Video, p. 324, *id.* *t. c.*

Stenides.

CASEY, T. L. Revision of the *Stenini* of America north of Mexico.
 Philadelphia : 1884, 8vo, pp. 206, plate.

The numbers described are as follows :—*Dianous* (3), *Stenus* (130),
 and *Areus* (42). Many species are described as new. The plate illus-
 trates details.

Evæsthetini. Characters discussed ; Casey, Col. N. Am. pp. 18 & 19.

Stenus (*Astenus*) *speculifrons*, Fauv., redescribed ; Arribáizaga, Bol.
 Ac. Arg. vii. p. 341.

Megalops cephalotes and *punctatus*, Erichs., occur in Minas Geraës as
 well as in Colombia ; Dohrn, S. E. Z. xlv. p. 44.

New genera and species :—

Mutinus, Casey, Rev. *Stenini*, pp. 8 & 146. Subgenus of *Stenus* ; last
 joint of antennæ short, in ♂ much shorter than the penultimate. Types,
S. (M.) gilæ, Arizona, and *dispar*, United States, spp. nn., *t. c.* pp. 146
 & 147.

Areus, *id.* *t. c.* p. 150. Differs from *Stenus* by the distinctly bilobed
 tarsal joint. To include *S. flavicornis* (= *geniculatus*, Say), *annularis*,
callosus, *arculus*, and *punctatus*, Erichs., and the following new species :—
A. retusus, Vancouver, p. 154, *fraternus*, Wyoming Territory, Lake
 Superior, p. 155, *umbratilis*, British Columbia, p. 156, *croceatus* (Fauv.,
 MS.), United States, *advena*, Lake Superior, p. 158, *europæus*, Maryland,
 Virginia, p. 160, *megalops*, Florida, *lugens*, Massachusetts, p. 161, *plicipennis*
 (Schwarz, MS.), Vancouver, p. 162, *agnatus*, British Columbia,
 p. 163, *sayi*, California, p. 164, *amabilis*, Delaware, p. 166, *perforatus*,
 Arizona, p. 169, *nitescens*, Florida, p. 170, *pollens*, Washington Territory,
 California, p. 171, *patens*, Colorado, p. 172, *reconditus*, Massachusetts,
 Lake Superior, Iowa, p. 173, *propinquus*, New Hampshire, p. 174, *canadensis*,
 Ontario, Illinois, p. 175, *pinguis*, Western States, p. 177, *utenis*,
 p. 178, *trajectus*, Colorado, p. 179, *papagonis*, Arizona, p. 180, *obsoletus*,
 Ontario, p. 181, *urtus*, New York, p. 182, *dilutus*, Louisiana, p. 184,

Type (from S. America) not named; b. R. 5, *varipes*, Michigan, p. 187, Raffr., is congeneric.

Reitter, Vancouver, p. 191, *lætulus*, California, p. 192, *leviceps*, *Reitter*, Vancouver, p. 193, *simiolus*, Lake Superior, p. 194, *pertinax*, Wyoming Territory, p. 195, and *lucidus*, California, p. 196.

Euæsthetus brevipennis, Michigan, p. 20, *punctatus*, *floridæ*, p. 21, *similis*, Florida, p. 22, *mundulus*, p. 23, *robustus*, Cambridge, Massachusetts, p. 24, *iripennis*, Ohio, p. 25, *texanus*, Texas, p. 26, *americanus*, United States, p. 27, and *atomus*, Florida, p. 28, Casey, Col. N. Am.

Edaphus carinatus, Washington, and *luculentus* (= *nitidus*, Lec., ?), Columbia, *id. t. c.* pp. 30 & 31 (*cf.* also p. 195).

Dianous zephyrus, *id.* Rev. Stenini, p. 11, Vancouver.

Stenus punctiger (Fauv., MS.), Colorado, p. 13, *gemmeus*, Georgia, p. 18, *bilentigatus*, Virginia, p. 19, *sculptilis*, Nevada, California, Washington Territory, p. 22, *laccophilus*, Ontario, p. 23, *verticosus*, Vancouver, Washington Territory, p. 25, *tristis*, California, p. 27, *austini*, New Hampshire, Lake Superior, British Columbia, p. 28, *ranops*, Southern States, p. 29, *delawarensis*, Middle States, p. 30, *sectator*, Washington Territory, p. 31, *zunicus*, Arizona, p. 32, *tacomæ*, Washington Territory, p. 34, *strangulatus* (Fauv., MS.), New York, Michigan, p. 39, *tenuis*, Ontario, *angustus*, Ontario, Massachusetts, p. 40, *difficilis* (Schwarz, MS.), Middle States to Ontario, p. 41, *pettiti*, p. 42, *scrupeus*, Lake Superior, Ontario, p. 43, *intrusus*, N. America, p. 44, *erythropus*, Michigan, Massachusetts, p. 46, *rugifer* (Fauv., MS.), Colorado, p. 47, *anastomozans* (Crotch, MS.), Mount Washington, p. 48, *shoshonis*, Washington Territory, p. 49, *insularis*, Vancouver, p. 50, *vexatus*, Washington Territory, p. 51, *schwarzi* (Fauv., MS.), p. 52, *pauper*, Massachusetts, p. 53, *subtilis*, Michigan, p. 54, *indigens*, Massachusetts, p. 55, *simplex* (Crotch, MS.), Oregon, p. 56, *vicinus*, United States, p. 57, *ingratus*, Michigan, p. 58, *neglectus*, N. America, p. 59, *scabiosus*, Lake Superior, p. 60, *vespertinus*, p. 61, *convictor*, Washington Territory, p. 62, *deducta* (= *confusus*, p. 63), Michigan, p. 204, *inornatus* (Schwarz, MS.), Massachusetts, Michigan, Lake Superior, p. 64, *placidus*, Michigan, p. 65, *mendax*, Massachusetts, p. 66, *eriensis*, Michigan, p. 67, *sphærops*, Massachusetts, p. 68, *militaris*, Lake Superior, p. 69, *pluto*, Massachusetts, p. 70, *incultus*, Arizona, p. 71, *corvus* (Schwarz, MS.), British Columbia, California, p. 72, *montanus* (Schwarz, MS.), New Hampshire, p. 74, *costalis*, Nevada, California, p. 77, *alveolatus*, Nevada, p. 78, *ellipticus*, p. 79, *adelops*, p. 80, *luctuosus*, California, &c., p. 81, *pusio* (Schwarz, MS.), Massachusetts, Canada, p. 82, *nanulus*, British Columbia, p. 83, *atomarius*, Michigan, Massachusetts, p. 84, *virginie*, Virginia, p. 87, *texanus*, Texas, p. 88, *venustus*, locality unknown, p. 89, *occidentalis* (Crotch, MS.), British Columbia, p. 90, *pacificus*, California, p. 91, *obstrusus*, New York, New Jersey, p. 92, *arizonæ* (Crotch, MS.), Arizona, Texas, p. 93, *integer*, Massachusetts, p. 94, *floridanus*, Florida, p. 95, *mammops*, United States, p. 97, *gravidus*, Massachusetts, p. 98, *animatus*, Lake Superior, p. 99, *tumicollis*, p. 100, *carinicollis*, Michigan, &c., p. 101, *insignis*, California, p. 102, *dolosus*, Colorado, p. 108, *villosus*, California, p. 109, *sectilifer*, Columbia, p. 110, *milleporus*, United States, p. 111, *jejunus*, British Columbia, *vinnulus*,

pinnia, pp. 185 & 203. * *Batrissodes*, p. 205.
 Massachusetts, Lake Superior, pp. 189 & 206. *Briara* (= *Gona-*
rigidus, Massachusetts, p. 119, *incertus*, Nebraska, p. 120, *parallelus*
 (Schwarz, MS.), Massachusetts, *noctivagus*, New Hampshire, p. 121, *luculentus*, California, p. 122, *juvencus*, Michigan, p. 123, *pauperculus*, Michigan (?), p. 124, *haplus*, Michigan, p. 125, *enodis*, Colorado, p. 126, *dives*, *subgriseus* (Schwarz, MS.), California, &c., p. 127, *terricola*, Nevada, p. 128, *mundulus*, Washington Territory, *tuberculatus*, Florida, p. 129, *indistinctus* (Schwarz, MS.), p. 130, *brumalis*, p. 131, *gratiosus*, Michigan, p. 133, *monticola*, New Hampshire, p. 134, *curtus*, Michigan, *alacer*, Southern States, p. 135, *hirsutus*, Michigan, p. 137, *vestalis*, California, p. 138, *tahoensis*, Nevada, *nimbosus* (Fauv., MS.), Colorado, p. 139, *pugentensis*, Washington Territory, p. 140, *vacuus*, California, p. 141, *amicus*, Colorado, p. 142, *exilis*, p. 143, and *californicus*, California, &c., p. 145, *id. t. c.*; *S. dobberti*, Quedenfeldt, B. E. Z. xxviii. p. 377, Morocco; *S. erythrocnemus*, Eppelsheim, Verh. Ver. Brünn, xxii. p. 16, Tiflis, Lenkoran; *S. holmbergii* and *S. (Stenosidotus) anescens*, Arribálzaga, Bol. Ac. Arg. vii. pp. 335 & 338, Buenos Aires.

Oxytelides.

Arribálzaga, Bol. Ac. Arg. vii. pp. 349-371, redescribes the following known species of *Oxytelides*: *Osorius piceus*, Er., *Oxytelus nitens*, Fauv., *Trogophleus riparius*, Boisd. & Lec. (= *corticinus*, var. *b*, Gyll., and *sobrinus*, Fairm. & Gemm.), and *Apocellus mendozanus*, Steinh.

Thinobius longipennis, Heer, var., and *Ancyrophorus omalinus*, Erichs., var. *venustulus*, Rosenh., noticed; Quedenfeldt, B. E. Z. xxviii. pp. 163 & 363.

Osorius incisicrurus, Latr., noticed; Dohrn, S. E. Z. xlv. p. 42.

Apocellus, Erichs. North American species tabulated and described; Casey, Col. N. Am. pp. 153-161.

Compsochilus cephalotes, Erichs. (= *procerus*, Er.), and *miles*, Scriba, differentiated and redescribed; Eppelsheim, Deutsche E. Z. xxviii. pp. 409-412.

New species:—

Osorius frater (Fauv., MS.), Arribálzaga, Bol. Ac. Arg. vii. p. 346, Buenos Aires.

Bledius externus and *testaceipennis*, *id. t. c.* pp. 353 & 355, Buenos Aires; *B. husseini*, Quedenfeldt, B. E. Z. xxviii. p. 377, Morocco.

Platystethus (Pycnocærus) fallax and *P. (P.) pallidipes*, Arribálzaga, *t. c.* pp. 360 & 362, Buenos Aires.

Apocellus bicolor, Nebraska, p. 154, *crassicornis*, Colorado, p. 156, *gracilicornis*, California, p. 157, and *brevipennis*, Louisiana, p. 158, Casey, Col. N. Am.

Trogophleus dilaticollis, Eppelsheim, Verh. Ver. Brünn, xxii. p. 16, Lenkoran; *T. (Tenosoma) atramentarius*, Arribálzaga, *t. c.* p. 371, Buenos Aires.

Thinobius (Thinophilus) nodicornis, Eppelsheim, *ibid.*, Lenkoran.

Compsochilus heydeni (Kraatz, MS.), *id.* Deutsche E. Z. xxviii. p. 413,

Type (from S. America) not named ; b. Reitter, Deutsche E. Z. xxviii. Raffr., is congeneric.
t. c. p. 378. Reitter, Verh. Ver. Brunn. xx. [cf. Zool. Rec. xix. Ins. p. 14]. Some were included in Zool. Rec. xx. from later papers ; these are marked with an asterisk in the following list, and are not further noticed :—*Epicaris* [after *Centrotoma* ; type, *Tetraxis* (?) *ventralis*, Raffr.], pp. 184 & 202. *Syntectodes* (allied to *Tmesiphorus* ; founded on an unnamed species from

Homaliides.

Eudectus rufulus, sp. n., Weise, Deutsche E. Z. xxviii. p. 270, Japan.

[*H*] *Omalium brevicolle*, Thomson, Opusc. Ent. x. p. 1033, Sweden ; *H. cephalotes*, Eppelsheim, Deutsche E. Z. xxviii. p. 170, Heilbronn : spp. nn.

Piestides.

Leptochirus convexus, Cast. (?), noticed ; Dohrn, S. E. Z. xlv. pp. 41 & 42.

PSELAPHIDÆ.

Lasinus, Sharp (1874), may = *Pselaphodes*, Westw. (1870), and *Bythinus inflatipes*, Reitt., is a dimorphic form of *clavicornis*, Panz. ; Reitter, Wien. ent. Z. iii. p. 144.

Tychus pullus and *mendax*, Kies., differentiated ; *T. myops*, Kies., = *rufus*, Motsch. ; *T. niger*, Payk., and allies, structure of antennæ : *id.* Deutsche E. Z. xxviii. pp. 50, 110, & 111.

Batrissus spinicollis, Sharp (*nec* Motsch. or Raffr.), renamed *dionysius* ; *B. similis*, Sharp (*nec* Schauf.), renamed *sharpi*, and *B. simplex*, Raffr. (*nec* Lec.), renamed *anticathedrus* : Schaufuss, Bull. Soc. Ent. Fr. (6) iii. p. cxvi.

Diartiger spinipes, *fossulatus*, *Lasinus spinosus*, *Pselaphus lewisii*, Sharp, *Batrissus antennatus*, Weise, *Triomicrus simplex*, *Batrissus pilosus*, Sharp, *Bythinus glabratus*, Rye, and *Euplectus trisulcicollis*, Broun, figured by Waterhouse, Aid, iii. pl. cxlvi. figs. 1-9.

|| *Amicrops* and || *Philus*, Saulcy, renamed *Bergrothia* and *Aphilops* respectively ; Reitter, Wien. ent. Z. iii. pp. 207 & 208.

Bryaxis transversalis, Schaum, noticed ; *id.* Deutsche E. Z. xxviii. p. 107.

Euplectini discussed, and species tabulated and described ; Casey, Col. N. Am. pp. 93-122.

Euplectus. Structure discussed ; Broun, N. Z. J. Sci. ii. p. 238. *E. nanus*, Reich., and allies, tabulated ; *E. nanus* var. *revelierei* (Saulcy, MS.), from S. Europe, noticed : Reitter, *t. c.* p. 113.

Table of genera of *Clavigeridæ* ; *id. t. c.* pp. 167 & 168.

Adranes lecontei, Brend. Structure and myrmecophilous habits noticed ; Dury, J. Cincinn. Soc. vii. p. 91.

New genera and species :—

Several new genera were characterized by Reitter in a paper published in Verh. Ver. Brunn. xx. [cf. Zool. Rec. xix. Ins. p. 14]. Some were included in Zool. Rec. xx. from later papers ; these are marked with an asterisk in the following list, and are not further noticed :—*Epicaris* [after *Centrotoma* ; type, *Tetraxis* (?) *ventralis*, Raffr.], pp. 184 & 202. *Syntectodes* (allied to *Tmesiphorus* ; founded on an unnamed species from

Ceylon), pp. 185 & 292. * *Ep/c.* p. 405, Borneo; *R. diabolica*, *id. op. cit.*
 * *Berlara*, pp. 189 & 206. * *Ba*
tocerus, Schauf., *nec* Nees), pp. 190 & 207. 388 and *schaefferi* *Psetaphus*;
 type, *P. merklii*, Reitt.), pp. 192 & 208. *Arhytodes* (= *Rhytus*, Westw.,
nec King), pp. 193 & 209. * *Apharina*, pp. 194 & 209. *Intempus* (after
Rhinosceptis; Philippines; no type mentioned), pp. 195 & 209. * *Bythino-*
pectus, pp. 195 & 209. * *Aphilia*, pp. 196 & 210. *Physoplectus* (after
Bibloporus; Australia; no type mentioned), pp. 197 & 210. *Dalnodes*
 (after last; no type), pp. 197 & 210. *Euplectops* (after last; to include
Euplectus odewalmi, King, *Trichonyx brevicollis*, Reitt., and allies), pp.
 197 & 210. *Adalmus* (after *Dalma*; New Zealand; no type), pp. 197 &
 210. *Namunia* (after *Trichonyx*; Asia Minor; no type), pp. 198 & 211
Raffrayia (after last; type, *Trichonyx antennatus*, Raffr.), pp. 198 &
 211. *Duciola* (after *Gasola*; West Indies; no type), pp. 199 & 211.
Balega (after last; West Indies; no type), pp. 200 & 211. And *Arcto-*
physis (after last; Colombia; no type), pp. 200 & 211.

Arnyllium, Reitter, Verh. z.-b. Wier, xxxiii. p. 391. Differs from
Batrissus by its thicker, more approximating antennæ, &c. To include
A. pectinatum, fig. 9, *ensipes*, fig. 10 (antennæ), pl. xx., and *parviceps*,
 spp. nn., t. c. p. 392, Borneo.

Batrissoschema, *id. t. c.* p. 399. Allied to *Batrissus*. Type, *B. lateri-*
dentata, sp. n., t. c. pl. xx. fig. 11, Borneo.

Bythinophanax, *id. t. c.* p. 405. Allied to *Bythinus*; shape and thickened
 second joint of tarsi as in *Bythinoderes*; abdomen above, as in *Bryaxis*.
 To include *B. latebrosus* and *exilis*, p. 406, and *bicornis*, pl. xx. fig. 13,
 p. 407, spp. nn., t. c., Borneo.

Bythinoderes, *id. t. c.* p. 407. Resembles a much compressed *Bryaxis*;
 abdomen more resembling that of *Bythinus*; second joint of all the tarsi
 thickened. Type, *B. grabowskyi*, sp. n., t. c. p. 408, pl. xx. fig. 14,
 Borneo.

Atychodea, *id. t. c.* p. 412. Allied to *Tychus* and *Pygoxion*. To include
A. simoniana, pl. xx. figs. 21 & 22 (antenna and palpus), p. 413, *lenticornis*,
 figs. 19 & 20 (antenna) *raffrayi*, fig. 23 (antenna), and *singularis*, fig. 24
 (antenna), p. 414, spp. nn., t. c., Borneo.

Thesium, Casey, Col. N. Am. ii. pp. 94 & 117. Allied to *Euplectus*;
 prosternum and mesosternum carinated, tenth joint of antennæ long. To
 include *E. cavifrons*, Lec., and *T. laticolle*, sp. n., t. c. p. 118, Texas.

Faliscus, *id. t. c.* pp. 94 & 120. Allied to *Thesium*; prosternum only
 carinate, eyes large and well developed in both sexes. Type, *E. bicanalis*,
 sp. n., t. c. p. 120, New York.

Nicotheus, *id. t. c.* pp. 94 & 121. Allied to last; eyes small and
 coarsely granulated in ♂, rudimentary in ♀. Type, *N. tibialis*,
 sp. n., t. c. p. 121, Columbia, Virginia.

Pseudofustiger [sic], Reitter, Deutsche E. Z. xxviii. p. 168. Allied to
Articerus; head contracted into a neck behind the eyes; thorax bell-
 shaped; abdomen with a very large groove, as in *Claviger*. Type, *A.*
stricticornis, Reitt.

Fustigerodes, *id. ibid.* Allied to *Commatocerus*; apical joint of
 antennæ cylindrical; abdomen with a transverse depression at the base.

SCYDMENIDÆ. ^{Ant. *Fustiger madagascariensis*,}

- Centrotoma laevis*, ~~Verh. z.-b. Wien~~, xxxiv. p. 63, Tyrol.
Enoptostomus doderi, Sardinia, and *judeorum*, Syria, Lebanon, *id.* t. c. p. 64.
Namunia myrmecophila, *id.* t. c. p. 81, Stamboul, Asia Minor.
Faronus spartanus (also *Deutsche E. Z.* xxviii. p. 51), Taygetus, and *gravidus*, S. Spain, *id. ibid.*
Marellus biskrensis, *id. ibid.*, Biskra.
Pselaphus laevicollis, Ceylon, *unipunctatus*, *biocellatus*, Borneo, p. 410; *brevicornis*, Batavia, and *sexstriatus*, Borneo, p. 411, *id.* Verh. z.-b. Wien, xxxiii.; *P. quadricostatus*, Monte Rosa, *bistriolatus*, Coimbra, and *cavi-ventris* (cf. also *Deutsche E. Z.* xxviii. p. 50), Morea, *id. op. cit.* xxxiv. p. 78.
Tychus nodifer (cf. *D. E. Z.* xxviii. p. 49, pl. ii. fig. 16), Morea, p. 76, *caudatus* (cf. *D. E. Z.* xxviii. pp. 49 & 110), Zante, *mutinensis*, Modena, *gibbiventris*, Beyrout, *serbicus*, Servia, p. 76, and *florentinus* (Saulcy, MS.), p. 77, *id. t. c.*; *T. nodicornis*, *id.* *Deutsche E. Z.* xxviii. p. 109, Corfu; *T. testaceus*, Casey, Col. N. Am. p. 31, Northern States.
Pygoxyon tychioforme, Reitter, Ann. Mus. Genov. (2) i. p. 370, Italy.
Apharina fuscipennis, *id.* Verh. z.-b. Wien, xxxiii. p. 415, pl. xx. fig. 15 (antenna), Borneo.
Filiger primus, *id. ibid.* fig. 18, Borneo.
Zethopsus sculptifrons, Batavia, and *simplicifrons*, Borneo, *id. t. c.* p. 419.
Amaurops coreyrea, *id. op. cit.* xxxiv. p. 64, and *Deutsche E. Z.* xxviii. p. 106, Corfu.
Amicrops mingrelia, *id.* Verh. z.-b. Wien, xxxiv. p. 65, Mingrelia.
Batrisus denticollis, Columbia, *virginia*, Virginia, and *aterrimus*, Massachusetts, Casey, t. c. pp. 89-91; *B. (Batrisodes) elysius*, Reitter, *Deutsche E. Z.* xxviii. p. 47, and Verh. z.-b. Wien, xxxiv. p. 65, N. Morea; *B. bipunctulus*, *vestigifer*, fig. 3 (abdomen), p. 394, *cavifer*, *claviger*, p. 395, *architectus*, fig. 4 (abd.), *laminidens*, fig. 5 (abd.), *tarsalis*, fig. 6 (leg), *pubifer*, p. 397, *B. (Syrbatus) spinidens*, fig. 7 (hind tibia), *B. lateridens*, p. 398, and *B. orbicollis*, fig. 8, p. 399, *id.* Verh. z.-b. Wien, xxxiii. pl. xx., Borneo.
Arthmius gracilior, Casey, t. c. p. 88, Florida.
Tribatus creticus, Reitter, t. c. p. 66, and Wien. ent. Z. iii. p. 8, Crete.
Machærites dentimanus, *id.* Ann. Mus. Genov. (2) i. p. 369, Sardinia.
Bryaxis gracilis, Michigan, *inopia*, Florida, and *facilis*, Long Island, Casey, Col. N. Am. pp. 32, 33, and 87; *B. sylvicola*, Broun, N. Z. J. Sci. ii. p. 238, New Zealand; *B. carmelitana*, Syria, *maxima* (cf. *D. E. Z.* xxviii. p. 48), Taygetus, p. 67, *tetuanica*, Tetuan, *longispina* (*D. E. Z.* xxviii. p. 106), Italy, Dalmatia, Greece, *langei*, Syria, *talyschensis*, p. 68, *spinipes*, Lenkoran, and *morio* (*D. E. Z.* xxviii. p. 107), Zante, p. 69, Reitter, Verh. z.-b. Wien, xxxiv.; *B. (Reichenbachia) affinima*, *amitta*, *telangensis*, p. 402, *integrostriata*, pl. xx. fig. 12 (tibiae), *ingrata*, *negligens*, p. 403, and *subvalida*, p. 404, *id. op. cit.* xxxiii., Borneo.
Centrophthalmus bispinus, pl. xx. fig. 2 (head), and *divisus*, *id. t. c.* p. 390, Borneo.

Rybaxis amica, Reitter, t. p. s, *declinatus*, *simulus*, and *potior*, p. 427, xxxiv. p. 66, Syria.

Cyathiger simonis, p. 387, *baumeisteri*, p. 388, and *mandufussi*, p. 389, *id. op. cit.* xxxiii., Borneo.

Enantius rostratus, *id. t. c.* p. 390, pl. xx. fig. 1 (head), Borneo.

Hybocephalus dentiventris, p. 416, *telangensis*, fig. 16, and *informis*, fig. 17, pl. xx. (antennæ), p. 417, *id. t. c.*, Borneo.

Bythinus difficilis, *id. Ann. Mus. Genov.* (2) i. p. 369, Sardinia; *B. peloponnesius* and *brenskei*, *id. Deutsche E. Z.* xxviii. p. 48, pl. ii. figs. 12, 12a, & 14, Morea, &c.; *B. (Machærites) maritimus*, Maritime Alps, *B. (M.) gladiator*, *B. (M.) eppelsheimi*, Italy, p. 70, *B. baudneri* (Saulcy, MS.), *corecyreus* (cf. D. E. Z. xxviii. p. 108, pl. ii. figs. 13 & 13a), Corfu, p. 71, *nakeralæ*, Caucasus, *latebrosus*, Nice, p. 72, *montivagus*, Pyrenees, *appendiculatus*, Caucasus, *swaneticus*, Swanetia, p. 73, *inflatus*, Germany, *blandus*, S. Europe, *banaticus*, p. 74, *unicornis*, Banat, and *tener* (cf. D. E. Z. xxviii. p. 109, pl. i. fig. 15, antenna), Corfu, p. 75, *id. Verh. z.-b. Wien*, xxxiv.

Euplectus acanthifer (cf. D. E. Z. xxviii. p. 111), Corfu, p. 79, *rhenanus*, Rhine Province, *tenuicornis*, Hungary, Silesia, *pelopis* (cf. D. E. Z. xxviii. p. 51), Morea, *verticalis* (cf. D. E. Z. xxviii. p. 113), Corfu, and *lindleri* (cf. D. E. Z. xxviii. p. 51), S. Europe, p. 80, *id. t. c.*; *E. doderoi*, *id. Ann. Mus. Genov.* (2) i. p. 370, Sardinia; *E. divergens*, *id. Verh. z.-b. Wien*, xxxiii. p. 420, pl. xx. fig. 25 (head), Borneo; *E. longicollis*, Maryland, p. 99, *congener*, Columbia, p. 101, *sexualis*, S. Carolina, p. 103, *spinifer*, Texas, Georgia (P), p. 104, *pertenuis*, Columbia, p. 109, *capitulum*, Florida, Michigan, p. 112, *decorus*, Texas, p. 113, and *leviceps*, Columbia, Maryland, p. 115, Casey, Col. N. Am.; *E. crassipes*, *pubrulis*, p. 238, *monticola*, *ovithorax*, *obniscus*, *vacuus*, *incomptus*, *murificus*, *u-impressus*, and *cercus*, p. 239, Broun, N. Z. J. Sci. ii., New Zealand.

Trimium brenskei, Morea, and *expandum*, Ionian Islands, Reitter, *Deutsche E. Z.* xxviii. pp. 51 & 111, and *Verh. z.-b. Wien*, xxxiv. p. 79.

Claviger elysius, Reitter, *Verh. z.-b. Wien*, xxxiv. p. 60, and *Deutsche E. Z.* xxviii. p. 47, Greece; *C. barbarus*, Bedel, *Bull. Soc. Ent. Fr.* (6) iv. p. cxxiv., Algeria.

PAUSSIDÆ.

Cerapterus (Orthopterus) lafertei, Westw., discussed; Dohrn, S. E. Z. xlv. pp. 39 & 40.

Paussus (Orthopterus) smithii, Macl., is distinct from *concolor*, Westw. Dohrn, S. E. Z. xlv. pp. 407 & 408.

Arthropterus angulatus, Macl. (= *melbourni*, Westw.), and *denudatus*, Westw. (= *angusticornis*, Macl.), noticed; Gestro, *Ann. Mus. Genov.* xx. pp. 303 & 304.

Paussus pipitzi and *mucius*, spp. nn., Dohrn, S. E. Z. xlv. pp. 44 & 45, Madagascar.

Liodes humeralis, Fabr., var. described.

D. xxiii.

IDE.

Reitter, Verh. V. p. 104. SCHAUFUSS, L. W. Die Scydmaniden Nord-Ost-Africa's, der Sunda-Inseln und New-Guinea's, im Museo Civico di Storia Naturale zu Genua. Untersucht und bearbeitet. Ann. Mus. Genov. (2) i. pp. 387-424.

This paper consists chiefly of descriptions of new species, but commences with a table of the *Scydmanidae* of Abyssinia and Asia. The following known species are also noticed:—*Scydmenus pyriformis*, Nietn. (of which *semisulcatus*, Reitt., may be a var.), *S. (Euconus) imaguncula*, *S. (E.) imparatus*, *S. (E.) samharæus*, *S. (E.) quinquepunctatus*, Reitt., *Eumicrus gemellus*, *astutus*, *bogosensis*, *abyssinicus*, *ruffrayi*, and *schaufussi*, Reitt.

New genera and species:—

Elacatophora, Schaufuss, Ann. Mus. Genov. (2) i. p. 403. Differs from all described genera of *Scydmanidae* by the long filiform palpi, tapering to a point. Type, *E. robusta*, sp. n., t. c. p. 404, Java.

Agathelor, id. t. c. p. 420. Allied to *Eumicrus*; flattened, eyes large, joints of tarsi short and thick. Types, *A. deplanatum* and *brevitarse*, spp. nn., t. c. p. 421, Sarawak.

Cephennodes, Reitter, Verh. z.-b. Wien, xxxiii. p. 420. Allied to *Pseudocephennium*, but abdomen composed of six nearly equal free segments. Type, *C. simonis*, sp. n., t. c. p. 421, Borneo.

Neuraphes planiceps (Saulcy, MS.), Vallombrosa, p. 84, *nakeralæ*, Caucasus, *emona*, Laibach, *flaminii*, Apennines, p. 85, *subtetratomus*, Morea, *profanus*, Dalmatia, Morea, &c., *parilis*, S. Portugal, p. 86, and *vulneratus* (Saulcy, MS.), p. 87, Corsica, Reitter, Verh. z.-b. Wien, xxxiv.

Scydmanus ægialius (cf. Deutsche E. Z. xxviii. p. 53), Morea, *barnevillei* (Saulcy, MS.), France, *andalusiæus*, Andalusia, *semipiceus*, Caucasus, p. 87, *macedo* (Saulcy, MS.), Salonica, *tythonus*, S. Spain, *S. (Stenichnus) ellipticus*, Elisabethpol, p. 88, *S. (S.) angulimanus*, *S. (S.) emgei*, Greece, *S. (S.) amplithorax*, Syria, *S. (S.) corcyreus* (cf. D. E. Z. xxviii. p. 113), Corfu, and *S. (S.) lernæus*, Nauplia, p. 89, *id. t. c.*; *S. poweri*, Fowler, Ent. M. M. xx. p. 247, England; *S. nigripalpis*, *fractionis*, Sarawak, *longipalpis*, p. 395, *gestroi*, Macassar, p. 396, *bilalus*, New Guinea, p. 397, *pictoris*, Macassar, *seminudus*, Bali, p. 398, *furcatus*, Abyssinia, p. 400, *singalanensis*, Sumatra, p. 401, *zanzebaricus*, Zanzibar, and *bradypodus*, Sarawak, p. 402, Schaufuss, t. c.

Euconus (Napochus) indocilis, Syria, *E. pulcher* (cf. D. E. Z. xxviii. p. 53, pl. ii. fig. 17), Morea, *paulinoi*, Coimbra, *prolixus*, Syria, p. 90, *vehulosus*, Morocco, *langei* and *peyroni* (Saulcy, MS.), Syria, *E. (Tetramelus) bedeli*, Maritime Alps, p. 91, *E. (T.) argostolius* (cf. D. E. Z. xxviii. p. 114), Cephalonia, *E. (T.) marthæ* (cf. D. E. Z. xxviii. p. 114), Ionian Islands, *E. (T.) pravus* (cf. D. E. Z. xxviii. p. 54), and *E. (T.) bremskeanus* (cf. D. E. Z. xxviii. p. 54), N. Morea, p. 92, Reitter, Verh. z.-b. Wien, xxxiv.; *E. (Napochus) clavigeroides*, *luculus*, *charon*, p. 423, *discedens*, *eumicroides*, *favorabilis*, p. 424, *telangensis*, *semisulcatus*, *sparulus*, p. 425, and *nigritulus*, p. 426, *id. op. cit.* xxxiii., Borneo.

52 *Ins.*

- Belon, *t. c.* pp. cccix.-ccxxi. *M. ovali-*
vipes, Com. ; Reitter, Wien. ent. Z. iii.
Eumicrus frontalis, p. 426, *agilis*.
 Reitter, *t. c.*, Borneo ; *E. camelus*
 Algiers, *parmatus*, Morocco, and *arachnipes*, Syria, *id. op. cit.* xxxiv. p. 93 ;
E. reitteri, Java, *aruensis*, Aru, *tricolor*, New Guinea, p. 407, *manicio-*
ranus, p. 408, *cohærens*, Sarawak, p. 409, *ovicollis*, locality unknown,
bellus, *tythops*, New Guinea, p. 410, *bulbosus*, Key, p. 411, *umbonatus*,
ruficornis, p. 412, *intactus*, *burmeisteri*, New Guinea, p. 413, *filicornis*,
 Java, p. 414, *convexus*, Sarawak, *subsimilis*, Sumatra, p. 415, *tenuicornis*,
 Java, Key, p. 416, *auroræ*, New Guinea, p. 418, *uncinatus*, *doriæ*,
 Sumatra, p. 419, Schaufuss, *t. c.* ; *E. vestalis*, Arizona, and *punctatus*,
 Michigan, Casey, Col. N. Am. pp. 85 & 86.
Leptomastax bisetosus (*cf.* also D. E. Z. xxviii. p. 115), Corfu, and
quadristriatus, Syria, Reitter, *op. cit.* xxxiv. pp. 93 & 94.
Euthia clavicornis, *id. t. c.* p. 82, and Deutsche E. Z. xxviii. p. 53,
 Morea.
Cephennium doriæ, Schaufuss, *t. c.* (2) i. p. 422, Sarawak ; *C. (Cephen-*
narium) sardoum, Reitter, Ann. Mus. Genov. (2) i. p. 371, Sardinia ; *C.*
(Megaladerus) divergens, Arragon, *C. (M.) maritimum*, Maritime Alps,
 p. 82, *C. (M.) montanum*, Monte Rosa, *C. (M.) delicatum*, S. Portugal, *C.*
(M.) aglenum, N. Italy, *C. (Geodytes) granulum* (Saulcy, MS.), Athens,
 Salonica, p. 83, *C. (G.) striolatum*, Andalusia, *C. (Cephemarium) carraræ*,
 Apennines, and *C. (Nanophthalmus) armeniacum*, Caucasus, p. 84, *id.*
 Verh. z.-b. Wien, xxxiv.
Syndicus sumatrensis, Schaufuss, *t. c.* p. 405, Sumatra.

SILPHIDÆ.

MARSEUL, S. A. DE. Précis des genres et espèces de la tribu des
 Silphides de l'Ancien-Monde. L'Ab. xxii. pp. 1-84.

Extends to *Catops*.

Silpha and allies. Larvæ discussed ; a table is given of those of *Silpha*
 and *Necrodes* : Karsch, Ent. Nachr. x. pp. 221-229.

Necrodes and *Thanatophilus*, Leach, = *Asbolus* and *Pseudopelta*, Voet,
 respectively ; Bergroth, B. E. Z. xxviii. pp. 229.

Necrophorus. Note on habits ; Schmidt, Feuille. Nat. xiv. pp. 89 & 90.

Silpha lapponica, Herbst (?) : larva destructive to potatoes in Norwegian
 Finland ; Aurivillius, Ent. Tidskr. v. pp. 203 & 230. *S. obscura*, Linn.,
 variety noticed ; Cavaniet, Feuille. Nat. xv. p. 11. *S. opaca*, Linn.,
 noticed as injurious to beet ; Savard, Bull. Insect. Agric. ix. pp. 22-25,
 fig. 2. *S. tyrolensis*, Laich., = *alpina*, Germ. ; Reitter, Wien. ent. Z. iii.
 pp. 240 & 241. *S. granulata*, Oliv., var. *unicostata* from Morocco
 described ; *id.* Deutsche E. Z. xxviii. pp. 57 & 58.

Bathysica. Table of species of South-East Europe ; *id. t. c.* p. 116.

Idiocheila spinipennis, Friv., = *Apatetica brunripes*, Rits. ; Ritsema,
 Notes Leyd. Mus. vi. p. 134.

Colon. Remarks on various species and varieties, including *C. appendi-*
culatum, Sahlb., var. *regiomontanum*, Czwal. (p. 265) ; Czwalina &
 Kraatz, Deutsche E. Z. xxviii. pp. 265-270.

Fein, Z. E. Ver. schles. (2) ix.

BYRRHIDÆ

Bisaya, g. n., ~~Matth.~~ Ver. Brünn, xxii. p. 3. An aberrant form of *Clambidæ* (?), with five-jointed tarsi. Type, *B. nossidiformis*, sp. n., t. c. p. 5, Lenkoran, Lirik.

New species :—

Pholeuon (*Apropeus*) *hazayi*, Frivaldszky, Term. füzetek, viii. p. 280, Hungary.

Necrophorus nigerrimus, Kraatz, Deutsche E. Z. xxviii. p. 230, Margellan.

Bathyscia kerkyrana, Reitter, Deutsche E. Z. xxviii. p. 115, Corfu ; *B. karamani*, Dalmatia, and *syriaca*, Beyrout, *id.* t. c. p. 255 and note ; *B. villardi*, Bedel, Bull. Soc. Ent. Fr. (6) iv. p. liii., France ; *B. (Sophrocheta) reitteri*, Frivaldszky, t. c. p. 280, Hungary.

Choleva sulcipennis, Fairmaire, C.R. ent. Belg. xxviii. p. lix., Algeria ; *C. kraatzi*, Reitter, t. c. p. 56, Morea.

Pltomaphagus grandis and *pelopis*, *id.* t. c. pp. 56 & 57, Morea.

Catops luteipes, Thomson, Opusc. Ent. x. p. 1033, Sweden.

Sciodrepa rugulosa, *id.* t. c. p. 1034, Sweden.

Colon puncticeps, Czwalina, Deutsche E. Z. xxviii. p. 267, Vallombrosa ; *C. decoris*, Casey, Col. N. Am. p. 84, Pennsylvania.

Hadrambe latissima, Reitter, t. c. p. 55, pl. ii. figs. 11 & 11a, N. Morea.

Anisotoma flavicornis, Brisout, Bull. Soc. Ent. Fr. (6) iii. p. cxliii., Jura, Savoy ; *A. bedeli*, *id.* Rev. d'Ent. iii. p. 88, Algeria.

Agathidium brisouti, Reitter, t. c. p. 58, Morea ; *A. caspicum*, *id.* Verh. Ver. Brünn, xxii. p. 3, Lirik.

TRICHOPTERYGIDÆ.

MATTHEWS, A. Synopsis of North American *Trichopterygidæ*. Tr. Am. Ent. Soc. xi. pp. 113–156.

Many new genera and species are described in addition to those previously known. The writer regards the *Trichopterygidæ* as probably the most extensive family of *Coleoptera*. He arranges the tribes as follows, placing the *Tricopterygidæ* immediately after the *Staphylinidæ* :—*Hydroscaphina*, *Trichopterygina*, and *Ptilina*.

— *Trichopterygidæ* found in Japan by G. Lewis. Cist. Ent. iii. pp. 77–84, pl. iv.

The Japanese species present a curious combination of European and tropical forms. The following known species are specially noticed :—*Trichopteryx cursitans*, Nietn., *fuscula*, Matth. (redescribed), and *Campodidium adustipenne*, Motsch. (genus and species redescribed and figured, pl. iv.).

Trichopteryx brevicornis, Motsch. Occurrence in England ; Billups, P. E. Soc. 1884, p. xviii., and Fowler, Ent. M. M. xxi. p. 35.

Anatrichis elongatula, Motsch., = *Trichopteryx invisibilis*, Nietn. ; Matthews, Tr. Am. Ent. Soc. xi. p. 154.

-icus, Motsch. (= *subcaneus*, Motsch.),
New genera and species: Hyden, Deutsche E. Z. xxviii. pp. 276
Championella, Matthews, Tr. *Ptinella*; integument hard, corneous, and convex; elytra abruptly and
 straightly truncated; abdomen with seven ventral segments. Type, *C.*
nubigena, sp. n., t. c. p. 119, Guatemala.

Pterycodes, id. t. c. p. 120. Intermediate between *Pteryx* and *Ptinella*.
 Type, *P. salvinii*, sp. n., t. c. p. 121, Guatemala.

Ptinella lewisiana, Matthews, Cist. Ent. iii. p. 78, Yokohama; *P.*
championana, *pellucida*, and *incerta*, id. Tr. Am. Ent. Soc. xi. pp. 116-118,
 Guatemala.

Trichopteryx godmanni, Vera Paz, p. 128, *lucida*, p. 129, *similior*,
 Central America, p. 130, *rufescens*, Vera Paz, *glauca*, Panama, p. 131,
angustipennis, Guatemala, p. 132, *excelsa*, p. 133, *minor*, p. 134, *brevior*,
 Guatemala, p. 136, *bidilatata*, Guatemala, Vera Paz, *nigrita*, Guatemala,
 p. 138, and *vitrea*, Panama, p. 139, id. t. c.; *T. radicola*, Delaware, p. 163,
funginus, p. 164, and *longipennis*, Philadelphia, p. 166, Casey, Col. N. Am.;
T. lewisii and *japonica*, Matthews, Cist. Ent. iii. pp. 79 & 81, Japan.

Nephanes pubescens, id. Tr. Am. Ent. Soc. xi. p. 141, Guatemala.

Ptilium hornianum, Texas, p. 143, *tropicum*, Panama, and *planum*, Gua-
 temala, p. 144, id. t. c.; *P. fungicola* and *truncatum*, Casey, t. c. pp. 162
 & 163, Philadelphia; *P. fissicollis*, Reitter, Deutsche E. Z. xxviii. p. 116,
 Zante, Corfu.

Actidium fowlerianum, Matthews, t. c. p. 146, Guatemala.

Ptenidium strangulatum, p. 148, *ignobile*, Guatemala, *nitens*, Chontales,
 foveatum, p. 149, *impunctatum*, p. 150, *obesum*, Guatemala, *speculifer*,
 Massachusetts, and *ulkei*, Columbia, p. 151, id. t. c.

SCAPHIDIIDÆ.

Bæocera nobilis, sp. n., Reitter, Ann. Mus. Genov. (2) i. p. 371,
 Sardinia.

HISTERIDÆ.

LEWIS, G. On some *Histeridæ* new to the Japanese Fauna, and notes
 of others. Ann. N. H. (5) xiii. pp. 131-140.

49 species are here enumerated, in addition to which the author pos-
 sesses 14 species of *Paromalus*, and 7 of *Saprinus* not yet determined.
 The following species are specially noticed:—*Hister quinquestriatus*,
 Motsch., = *duodecimstriatus*, Schrank; *Onthophilus striatus*, Lew. (nec
 Fabr.), = *flavicornis*, Lew.; *Hololepta amurensis*, Reitt., and *Onthophilus*
ostreatus, Lew.

SCHMIDT, J. Nachträge und Berichtigungen zum Catalogus Coleopte-
 rorum von M. Gemminger und E. v. Harold betreffend die Familie
 der *Histeridæ*. B. E. Z. xxviii. pp. 147-160.

The *Histeridæ* now number 1417 species, belonging to 73 genera.

—. Einige Bemerkungen über Histeriden. Deutsche E. Z. xxviii.
 pp. 236-238.

Relates to *Hister ariasi*, Mars, *desbrochersi*, Senac (= *sepulchralis*,

Anachalces revoili, Fairmaire, C.R. Africa.

(*Agurias*), *puncticollis*, Heer (probably = *laetus*, Sahlb., *Saprinus biterrensis*, Mars. (= *laetus*, Erichs., *pubescens*, Waltl (= *cemulus*, Ill.), *sabuleti*, Rosenh. (probably = *amanus*, Erichs.), *pullus*, Rosenh., *rugifrons*, Payk., var. *subtilis*, from Greece, *dimidiatus*, Ill., and *Homalodes sobrinus*, *pulvinatus*, and *faustus*, Erichs.

Saprinus pharao, Mars., recorded from Athens, and *Hister gangeticus* Mars., recorded from Arragon; Reitter, Wien. ent. Z. iii. pp. 33 & 249.

Hister smyrneus and *peyroni*, Mars., are not distinct; *id.* Deutsche E. Z. xxviii. p. 75.

New species :—

Hololepta depressa and *parallela*, Lewis, Ann. N. H. (5) xiii. p. 132, Japan.

Platysoma pini, *vagans*, p. 133, *rasile* and *celatum*, p. 134, *id. t. c.*, Japan; *P. hageni*, Marseul, Notes Leyd. Mus. vi. p. 161, Serdang, E. Sumatra.

Phelister glaucus, *id. t. c.* p. 162, Serdang, E. Sumatra.

Pachycrærus completus, Gerstaecker, JB. Hamb. Anst. i. p. 44, Massai.

Hister atticus, Schmidt, Wien. ent. Z. iii. p. 10, Attica; *H. aino*, p. 134, *concolor*, *boleti*, *agnatus*, p. 135, and *sutus*, p. 136, Lewis, *t. c.*, Japan.

Epierus lucus, *id. t. c.* p. 136, Japan.

Paromalus filum, Reitter, Deutsche E. Z. xxviii. p. 256, Bulgaria.

Notodoma fungorum, Lewis, *t. c.* p. 136, Japan.

Heterius gratus and *optatus*, *id. t. c.* p. 137, Japan; *H. bedeli*, *id.* Ent. M. M. xxi. p. 83, Algeria.

Eretmodes approximans, Fairmaire, C.R. ent. Belg. xxviii. p. lx., Algeria.

Triballus semen, Lewis, Ann. N. H. (5) xiii. p. 137, Japan; *T. acritoides*, Reitter, *t. c.* p. 75, pl. i. fig. 5, Morea.

Saprinus serekei and *cegiatus*, *id. t. c.* pp. 75 & 76, pl. i. figs. 6 & 7, Morea; *S. foveisternus*, Baku, and *speculum*, Sarepta, Schmidt, *t. c.* p. 9; *S. bomairii*, Fairmaire, *t. c.* p. lx., Algeria.

Trypanæus fugi and *venator*, Lewis, *t. c.* p. 138, Japan.

Onthophilus flavicornis, *silva*, and *arboreus*, *id. t. c.* p. 139, Japan; *O. cicatricosus*, Reitter, *t. c.* p. 76, Kumani, Greece.

Abreus areolatus, Hamarat, *minutissimus* and *punctulus*, Lenkoran, *id.* Verh. Ver. Brünn, xxii. p. 7; *A. convexus*, *id.* Wien. ent. Z. iii. p. 8, Attica, Syria.

Arcitus clarulus, *id.* Verh. Ver. Brünn, xxii. p. 7, Lenkoran.

PHALACRIDÆ.

Tolyphus syriacus, sp. n., Reitter, Deutsche E. Z. xxviii. p. 251, Haifa.

NITIDULIDÆ.

FOWLER, W. W. The *Nitidulidæ* of Great Britain. Ent. M. M. xxi. pp. 54-58, 92-98, & 142-147.

A synopsis of the British species.

vicus, Motsch. (= *subaneus*, Motsch.),
REITTER, E. Die Nitiduliden. *Myden*, Deutsche E. Z. xxviii. pp. 276-
299-302, pl. iv.

Includes tables of 37 genera, belonging to 4 sections, and descriptions of new species of *Carpophilus* and *Epuræa*. All the species are tabulated; but as the new species are not indicated, it has only been possible to indicate them by referring to the subsequently published parts of the paper. The genus *Monotoma*, Herbst, is included in this family.

|| *Micruria*, Reitter, renamed by him *Micrurula*; Wien. ent. Z. iii. p. 209.

Stelidota strigosa, Schönh., destructive to strawberries in America; Scholl & Riley, Bull. Dep. Agric. Ent. iv. pp. 80 & 81.

Melgethes. List of species found at Berlin; Schilsky, Deutsche E. Z. xxviii. pp. 421 & 422.

Epuræa æstiva, Linn., noticed; *id. t. c.* p. 422. *E. carpathica*, Reitter, var. *quadrimaculata* from Japan described by him; Wien. ent. Z. iii. p. 301.

Ipidia sibirica, Reitter, noticed and figured by him from Japan; *t. c.* p. 262, pl. iv. fig. 4.

New genera and species :—

Aphenolia, Reitter, Wien. ent. Z. iii. pp. 259 & 262. Allied to *Epuræa*; front tarsi only slightly expanded, and the hinder ones not at all. Type, *A. pseudosoronia*, sp. n., *t. c.* p. 262, Japan.

Parametopia, *id. t. c.* pp. 259 & 262. Allied to last; joints of club of antennæ placed laterally, serrated on the inside; shape nearly globular. Type, *P. x-rubrum*, sp. n., *t. c.* p. 262, pl. iv. fig. 6, Japan.

Physoronia, *id. t. c.* pp. 260 & 263. Allied to *Soronia*; but frontal carina not widened in front of the eyes; antennal sulci diverging. Type, *P. explanata*, sp. n., *t. c.* p. 263, Japan.

Atarphia, *id. t. c.* pp. 260 & 263. Allied to last, but shape of *Tarphius*; antennal sulci parallel. To include *A. fasciculata* (pl. iv. fig. 5) and *quadripunctata*, spp. nn., *t. c.* p. 263, Japan.

Lordyrodes, *id. t. c.* pp. 264 & 267. Allied to *Pocadius*; elytra with raised bristles, antennæ with joints 3 and 5 long, 4 shorter, 6-8 very small; all tarsi simple. Type, *L. latipes*, sp. n., *t. c.* p. 267, Japan.

Pocadites, *id. t. c.* pp. 264 & 267. Allied to last; antennæ with joint 3 long, 4-8 very small, front tarsi much widened. To include *Stelidota dilatimanus*, Reitt., and var. *dorsiger*, and *P. rufobusalis*, *oviformis*, and *corpulentus*, spp. nn., *t. c.*, Japan.

Engoniopus, *id. t. c.* pp. 264 & 267. Allied to *Strongylus*; club of antennæ rounded; labium cleft to the base; elytra truncated; the entire pygidium exposed; all the tibiæ produced into a long spine at the tip. Type, *E. lewisi*, sp. n., *t. c.* pl. iv. fig. 3, Japan.

Neopallodes, *id. t. c.* pp. 264 & 269. Allied to *Pallodes*; tips of front tibiæ generally with two small teeth; middle tibia simple; hind tarsi rather shorter than the tibiæ. Types, *N. clavatus* and *inermis*, spp. nn., *t. c.* p. 269, Japan.

Librodor, *id. t. c.* pp. 269 & 270. Allied to *Pityophagus*; body rather

Anachalces revoili, Fairmaire, C.R. ^{ss} of prothorax approximating.
Africa. ^{ssp nn t.c.} pp. 270 & 271, Japan.

Monotropion, *Rehn*, *ibid.* p. 212. Allied to *Europs*; but eyes nearly touching the prothorax. Type, *M. ferrugineum*, sp. n., *ibid.*, Japan.

Mimemodes, id. *ibid.* Allied to *Monotoma*; body hairy; elytra punctate-striate; head narrow. To include *M. monstrosus*, pl. iv. fig. 1, *cribratus* and *japonus*, spp. nn. (?), *ibid.*, from Japan.

Platychorodes, *id.* Deutsche E. Z. xxviii. p. 261. Allied to *Psilotes* and *Platychorus*, but with ten-jointed antennæ, with a two-jointed club. Type, *P. plumicornis*, sp. n., *ibid.*, Amazons.

Carpophilus acutangulus, cingulatus, p. 299, *lewisii* and *titanus*, p. 300, Reitter, Wien. ent. Z. iii., Japan; *C. zuni*, Casey, Col. N. Am., p. 34, Arizona.

Myiostrops orientalis, Olliff, Notes Leyd. Mus. vi. p. 245, Sumatra.

Epuraea papagona, Casey, t. c. p. 35, Arizona; *E. funeraria*, pp. 260 & 301, *decolor* and *apposita*, pp. 261 & 302, *submicrurula* and *rapax*, p. 261, Reitter, t. c., Japan.

Micrurula fuscipes and *dura*, *id. t. c.* p. 261, Japan.

Soronia lewisi and *pacta*, pl. iv. fig. 2, *id.* t. c. p. 263, Japan.

Melipethes mus and *mikado*, *id. t. c.* p. 265, Japan.

Idathina (Murr., MS., nec Reitt., but = || *Macroura*, Reitt.; cf. p. 74)
sobrina, Olliff, t. c. p. 73, Aru.

Æthina flavicollis, *maculicollis*, and *suturalis*, Reitter, t. c. p. 266, Japan.

Cychramus plagiatus, dorsalis, lewisi, subopacus, and floricola, id. ibid.,
Japan.

Pocadius unicolor and *rufimargo*, *id. t. c.* p. 267, Japan.

Lasiodactylus maculosus, Olliff, t. c. p. 74, Sumatra.

Strongylus brevisculus, *semiglobosus*, *dorsalis*, and *excellens*, Reitter, t. c. p. 268, Japan.

Cryptarcha inhabita, id. t. c. p. 269, Japan; *C. ritsemæ*, Olliff, t. c. p. 246, Sumatra.

Pallodes cyrtusoides, Reitter, t. c. p. 269, Japan.

Rhizophagus simplex, *japonicus*, *parviceps*, p. 271, and *subvillosus*, p. 272, *id. t. c.*, Japan; *R. procerus*, Casey, *t. c.* p. 168, Arizona.

Europæ temporis, Reitter, t. c. p. 272, Japan.

TROGOSITIDÆ.

Temnochila sp. Larva described; Dugès, C.R. ent. Belg. xxviii. p. liv.

Tenebrioides mauritanicus, Linn. Larva destructive to maize; Horváth, Rov. Lapok, i. pp. 104, 105, & xiv.

Leperina opatroides, sp. n., Lèveillé, Ann. Mus. Genov. (2) i. p. 637,
New Guinea, N. Australia.

Tenebrioides maroccanus, sp. n., Reitter, Deutsche E. Z. xxviii. p. 254,
Morocco.

Latolæva incensa, sp. n., Olliff, Notes Leyd. Mus. vi. p. 76, Salwatty, New Guinea, Aru.

Gaurambe reitteri, sp. n., id. t. c. p. 77, Aru.

-icus, Motsch. (= *subæneus*, Motsch.),
 Nyden, Deutsche E. Z. xxviii. pp. 276
 COL.

Ulonotus aberrans, Broun, figured by Waterhouse, Aid, iii. pl. cxlix.
 fig. 2.

Bothrideres reitteri, Rits, = *nocturnus*, Pasc.; Ritsema, Notes Leyd.
 Mus. vi. p. 134.

Trachypholis dorri, sp. n., Fairmaire, Bull. Soc. Ent. Fr. (6) iv. p. xlv.,
 Cambodia.

CUCUJIDÆ.

CASEY, T. L. Revision of the *Cucujidæ* of America north of Mexico. Tr.
 Am. Ent. Soc. xi. pp. 69-112, pls. iv.-viii. [Cf. also Col. N. Am. p. 195
 and (abstract) S. E. Z. xlv. pp. 401-404.]

A synonymic list is appended. The plates represent outlines or
 details. Several new species are described.

Prostomis americana, Cr., = *mandibularis*, Fabr.; *Cathartus opaculus*,
 Lec., is distinct from *quadricollis*, Guér; *Læmophleus longicornis*, Mann.,
 = *pusillus*, Schönh.: Casey, Col. N. Am. p. 195.

Brontes pleuralis, Sharp, figured by Waterhouse, Aid, iii. pl. cxlv. fig. 5.
Læmophleus abietis, Wank., is doubtfully distinct from *duplicatus*,
 Waltl; Reitter, Wien. ent. Z. iii. p. 144, and Deutsche E. Z. xxviii. p. 66.

Silvanus surinamensis, Linn. Habits discussed; Karsch, Ent. Nachr.
 x. pp. 261 & 262.

Airaphilus. Revised table of species; Reitter, Deutsche E. J. xxviii.
 pp. 66-69. *A. siculus*, Reitter, recorded by him from Dalmatia; Wien.
 ent. Z. iii. p. 249.

New genera and species:—

Dysmerus, Casey, Tr. Am. Ent. Soc. xi. p. 97. Allied to *Læmo-
 phleus*; second joint of antennæ joined laterally to the first; outer
 joints not flattened, no terminal process to the last. Type, *D. basalis*,
 sp. n., *ibid.* pl. vii. fig. 12, Florida.

Aciphus, Olliff, Ent. M. M. xxi. p. 152. Allied to *Diagrypnodes*
 Waterh.; but head transverse, mandibles simple, basal joint of
 antennæ longer, and eyes placed nearer their base. Type, *A. singularis*,
 sp. n., *ibid.*, Rio Janeiro.

Hectarthrum modestum, Fairmaire, C.R. ent. Belg. xxviii. p. 18,
 Africa.

Prostomis schlegelii, Olliff, Notes Leyd. Mus. vi. p. 100, Congo
 also noticed).

Inoplectus beraneki, Reitter, Deutsche E. Z. xxviii. p. 265, larva
 tobacco from Manilla.

Telephanus lecontei, Casey, Tr. Am. Ent. Soc. xi. p. 103, Arizona.

Læmophleus terminalis, pl. vi. fig. 2, Texas, p. 83, *floridanus*, pls. v.
 fig. 11, & vi. fig. 1, Florida, p. 85, *horni*, fig. 11, California, *rotundicollis*,
 fig. 12, pl. vi., S. Carolina, p. 89, *quadratus*, fig. 1, Gulf States, p. 90,
schwarzi, fig. 4, Florida, &c., p. 91, *extricatus*, fig. 5, Missouri, p. 92,

Anachalces revoili, Fairmaire, C.R. 9, Michigan, p. 93, and *denticulatus*, Africa.

Lathropus phyllis, *id. t. c.* p. 30, pl. viii. fig. 1, California.

Silvanus gile, *id. t. c.* p. 73, Arizona.

Cryptamorphus hubbardi, *id.* Col. N. Am. p. 167, Florida.

Airaphilus hirtulus, Greece, p. 66, *arcadius*, Morea, p. 67, and *subferugineus*, Pyrenees, p. 69, Reitter, *t. c.*

CRYPTOPHAGIDÆ.

Leucohimatium. Table of species; Reitter, Deutsche E. Z. xxviii. pp. 62 & 63.

Leucohimatium alatum, sp. n., *id. t. c.* p. 62, pl. i. fig. 8, Attica.

Atomaria castanoptera, Reitter, Verh. Ver. Brünn, xxii. p. 5, Lenkoran; *A. jonica*, Ionian Islands, and *levis*, Haifa, *id.* Deutsche E. Z. xxviii. pp. 117 & 252: spp. nn.

LATHRIDIIDÆ.

BELON, F. M. J. Révision des *Lathridiidae* de Nouvelle-Zélande. Rev. d'Ent. iii. pp. 246-266.

31 species described, several new.

FVÆRTS, E. Bijdrage tot de kennis der *Lathridiidae*. Tijdschr. Ent. xxvii. pp. 55-95.

9 genera, belonging to the 3 sections *Merophysini*, *Lathridiini*, and *Corticarini*, are tabulated, and subsequently described with the species they include (none new).

Belon C.R. ent. Belg. xxviii. pp. ccxxii.-ccxxiv., discusses the *Lathridiidae* of New Zealand, including *Holoparamesus lucidus*, Broun (= *tenuis*, Reitt.), *Lathridius antipodum*, White (= *nodifer*, Westw., and probably *sculpturatus*, Broun), *costulatus*, Broun (= *costatus*, Erichs., and ? *marginalis*, Broun), *Corticaria obesa*, Broun (= *Melanophthalmus splendens*, Reitt.), &c.

Monotoma, Herbst, is placed in the *Nitidulidae* (q. v.); Reitter, Wien. ent. Z. iii. p. 272.

Reitter, Deutsche E. Z. xxviii. pp. 63-65 & 119, tabulates the species of *Holoparamesus*, Curt., *Metophthalmus*, Woll., and *Dasycerus*, Broun.

Corticaria. Brisout, Bull. Soc. Ent. Fr. (6) iv. pp. cxviii. & cxix., discusses several species, including the following:—*C. longicornis*, Gyll., and *lapponica*, Zett., are distinct; *flavescens*, Thoms. = *fulva*, Com.; *depressa*, Thoms., and *interstitialis*, Reitt., = *mannerheimi*, Reitt.; *denticulata*, Bris., probably = *saginata*, Mannerh.; *interstitialis*, Bris., = *denticulata*, Gyll.; *fagi*, Woll., = *crenicollis*, Mannerh.; *melanophthalma*, Mannerh., is distinct from *crenicollis*; and *latipennis*, Sahlb., = *similata*, Gyll.

Cartodere. Table of Hungarian species, with notes on *C. filum*, Aubé; Frivaldsky, Rov. Lapok, i. pp. 44 & vi.: *C. filiformis*, Gyll., and allies, discussed; Belon, C.R. ent. Belg. xxviii. pp. cxi.-cxiii.

Melanophthalma. New Zealand species monographed, including *M. illustris*, Reitt. (= *Corticaria fasciata*, Broun), *M. variegata* and dis-

Parry), and *Cladognathus dauricus*, Motsch. (= *subaeneus*, Motsch.), noticed from Askold; Von Heyden, Deutsche E. Z. xxviii. pp. 276 & 277.

Lucanus cervus, Linn., noticed; Cornelius, JB. Ver. Elberfeld, vi. p. 33. *L. laticollis*, Thunb., probably = *Eurytrachelus saiga*, Burm. (= *gypaetos*, Cast.); Albers, Deutsche E. Z. xxviii. pp. 303 & 304.

Odontolabis carinatus, "Reitt." Cocoons noticed; Sharp, P. E. Soc. 1884, p. xviii.

Eurytrachelus purpurascens, Vollenh., *gypaetos*, Cast. (= *saiga*, Burm.), *intermedius* and *ghilianii*, Gestro (probably = *ternatensis*, Thoms.), discussed. The two former exhibit a large ♂ form (*capito*, Burm.) with short jaws as in ♀; and *E. ghilianii* is perhaps the corresponding form of *E. intermedius*. Albers, t. c. pp. 173-175 & 304.

Figulus anthracinus, Klug, *sublævis*, Beauv., and a new species discussed; *F. nigritus*, Westw., may not be distinct from *anthracinus*: *id.* S. E. Z. xlv. pp. 173-176. *F. modestus*, Parry, = *fissicollis*, Fairm.; Sharp, C.R. ent. Belg. xxviii. p. lxxx.

|| *Metallactus*, g. n., Albers, Deutsche E. Z. xxviii. pp. 301-303. Allied to *Dorcus*. Type, *Lucanus parvulus*, Hope.

Nigidius amplicollis, Quedenfeldt, B. E. Z. xxviii. p. 266, Quango; *N. dentifer*, Albers, Deutsche E. Z. xxviii. p. 16. Central Africa: spp. nn.

Figulus decipiens, sp. n., *id.* S. E. Z. xlv. p. 173, W. Africa.

PASSALIDÆ.

Passalus (Didimus) duplicatus, Har., and *P. (Eriosomus) planiceps*, Esch. (= *dasypleurus*, Imh.), noticed; Quedenfeldt, B. E. Z. xxviii. pp. 267 & 268.

Pelops gularis, sp. n., Waterhouse, Ann. N. H. (5) xiii. p. 279, Ki Dulan.

SCARABÆIDÆ.

List of 9 *Scarabæidæ* (3 new) collected by the late W. A. Forbes on the Lower Niger; Bates, P. Z. S. 1884, pp. 414-416.

Anomala vitis and *frischii*, Fabr., and *Polyphylla fullo*, Linn. Ravages in Hungary; Sajó, Rov. Lapok, i. pp. 166-169 & xxiii. fig. 37.

Coprides.

Scarabæus. Etymology; Clarkson, Canad. Ent. xvi. pp. 18 & 19.

Heliocopris samson, Har., noticed, and *Catharsius dux*, Har., ♂ described; Quedenfeldt, B. E. Z. xxviii. pp. 270 & 271.

Onthophagus sp. from Askold noticed; Von Heyden, Deutsche E. Z. xxviii. p. 293.

New species:—

Scarabæus lavifrons and *planifrons*, p. cxxi., *opacipennis*, *salebrosipennis*, E. Africa, and *nepos*, Zanzibar, Fairmaire, C.R. ent. Belg. xxviii. p. cxlii.

Gymnopleurus olivaceus, Quedenfeldt, B. E. Z. xxviii. p. 269, Malange.

Anachalces revoili, Fairmaire, C.R. Ent. Belg. xxviii. p. lxxiii., E. Africa.

Epirinus thacifrons, *id. t. c.* p. 41., E. Africa.

Heliocopris portentosus, Gerstaecker, JB. Hamb. Anst. i. p. 49, Massai.

Catharsius gibbicollis, *id. t. c.* p. 50, Massai.

Copris pronus and *typhaeus*, *id. ibid.*, Massai; *C. inhalatus*, Quedenfeldt, t. c. p. 272, Malange; *C. pecuarius*, Lewis, Wien. ent. Z. iii. p. 17, Nikko.

Onthophagus lamellicollis, p. 273, *speculicollis*, p. 274, *unidens*, fig. 2, *fossicollis*, fig. 3, p. 275, *cinctipennis*, p. 276, *foliiceps*, fig. 4, Malange, p. 277, and *validicornis*, fig. 5, Quango, p. 278, Quedenfeldt, t. c. pl. viii.; *O. aurifrons* and *diffissimus*, Fairmaire, t. c. p. cxxii, E. Africa.

Oniticeilus interruptus, Quedenfeldt, t. c. p. 279, Malange.

Aphodiides.

Atenius crenulatus, Fairm., = *Euparia cribricollis*, Burm.; Berg, Bull. Soc. Ent. Fr. (6) iv. p. xeviii.

Rhyssenus, Muls. Table of French species; Chalaude, Feuille. Nat. xiv. pp. 72-74.

Notocaulus, g. n., Quedenfeldt, B. E. Z. xxviii. p. 285. Allied to *Ryparus* and *Syba*. Type, *N. nigropiceus*, p. 286, pl. viii. fig. 6, Angola, and *N. variculatus*, Natal, p. 287, note, spp. nn., t. c.

Aphodius flavipennis, Miller, Verh. z.-b. Wien, xxxiii. p. 265, Par-nassus; *A. massaicus* and *harpalinus*, Gerstaecker, JB. Hamb. Anst. i. p. 49, Massai; *A. hepaticolor*, p. 281, *semitens*, p. 282, *serrulatus*, p. 283, and *pumilus*, p. 284, Quedenfeldt, B. E. Z. xxviii., Malange: spp. nn.

Atenius crenatulatus, sp. n., Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 489, Punta Arena.

Orphnides.

Cerhomalus, g. n., Quedenfeldt, B. E. Z. xxviii. p. 289. Allied to *Orphnus*, but much larger, and more of the shape of *Aphodius*. Type, *C. mehowi*, sp. n., t. c. p. 290, pl. viii. fig. 7, Quango.

Hybaloides, g. n., *id. t. c.* p. 291. Intermediate between *Hybalus* and *Orphnus*. Type, *H. foveolatus*, sp. n., t. c. p. 392, pl. viii. fig. 8, Quango.

Orphnus compactilis and *angolensis*, *id. t. c.* pp. 287 & 288, Malange; *O. hildebrandtii*, Fairmaire, S. E. Z. xlv. p. 131, Madagascar: spp. nn. *Ochodcus alleonis*, sp. n., *id. Bull. Soc. Ent. Fr. (6) iii.* p. cxli., Dobrudscha.

Hybosorides.

Phaeochrous dispar, sp. n., Quedenfeldt, B. E. Z. xxviii. p. 293, Malange.

Geotrupides.

Taurocerastes patagonicus, Phil., redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 489.

Geotrupes. Monograph of French species; Chalaude, Bull. Soc. Toulouse, xvii. [1881] pp. 94-117. *G. stercorarius*, Linn., with malformed legs; Allix, Feuille. Nat. xiv. p. 118. *G. sylvaticus*, Panz., var. *prussicus*, noticed; Czwalina, Deutsche E. Z. xxviii. p. 261.

Lethrus apterus, Laxm. Transformations, &c., described; Emich & Mocsáry, Rov. Lapok, i. pp. 30-33, 59, 60, iv., v., & viii. pl. ii.

Bolboceras tenuelimbatus, sp. n., Quedenfeldt, B. E. Z. xxviii. p. 294, Malange.

Trogides.

Trox globulatus, sp. n. [= *hemispharicus*, Burm.; Berg, Bull. Soc. Ent. Fr. (6) iv. p. xcvi.], Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 490, Punta Arena.

Glaphyrides.

Amphicoma angulata, sp. n., Fairmaire, Ann. Soc. Ent. Fr. (6) iv. p. 168, Akbès.

Melolonthides.

KOLBE, H. J. Kurze Bemerkungen über Farbenvarietäten einiger *Melolontha*- und *Anoxia*-Species. B. E. Z. xxviii. p. 76.

Relates to *Melolontha papposa*, Ill., *pectoralis*, Germ., *præambula*, Kol., *hybrida*, Charp., *Anoxia australis*, Gyll., var. *matutinalis*, Meg., *villosa*, Fabr., and *Polyphylla fullo*.

WESTHOFF, F. Ueber die Farben- und Behaarungs-Varietäten der *Melolontha vulgaris* und *hippocastani*, Fabr. B. E. Z. xxviii. pp. 55-74. (Cf. also Kraatz, B. E. Z. xxviii. p. 405, and Von Heyden, Deutsche E. Z. xxviii. p. 416.)

The variations are classified and diagnosed, with observations. The following names are new:—*M. vulgaris* varr. *scapularis*, *melanopus*, *funesta*, *humeralis*, *luctuosa*, and *obscuripes*, and *M. hippocastani* varr. *metzleri*, *pectoralis*, *amasicola*, *æthiops*, and *festiva*.

Serica. Quedenfeldt notices the characters, structure, &c., of *Serica* and its allies; B. E. Z. xxviii. pp. 295-298. *S. confinis*, Burm., noticed; *id. t. c.* p. 307. *S. brunnea*, Linn., noticed; Lefèvre, Bull. Soc. Ent. Fr. (6) iii. p. lxxxiii.

Trochalus carinatus, Gyll., noticed; Quedenfeldt, *t. c.* pp. 298 & 299.

Lachnoderia, Erichs., recharacterized; Fairmaire, S. E. Z. xlv. p. 275.

Lachnosterna fusca, Fröhl., and allies, differentiated; Casey, Col. N. Am. pp. 38-40. Ravages in N. America; Rep. Fruit-Growers' Ass. Ont. 1883, pp. 18-21 & 163-165: hyperparasitism of *Tiphia*, &c., on its larva; *Lugger, Sci. Rec. ii. p. 232 (cf. *Psyche*, iv. p. 211).

Rhizotrogus solstitialis, Linn.: two Dipterous parasites (*Hirmononeura obscura*, Meig., and *Phorostoma latum*, Egger) discussed; Brauer, SB. z.-b. Wien, xxxiii. p. 19, and SB. Ak. Wien, lxxxviii. pp. 865-877, pls. i. & ii. *R. dispar*, Buq., noticed; Lucas, Bull. Soc. Ent. Fr. (6) iv. p. lv.

Polyphylla olivieri, Cast., alluded to; Dohrn, S. E. Z. xlv. pp. 85 & 86. *P. ragusea*, Kraatz, and a doubtful specimen of *P. olivieri*, the latter from Naxos, noticed; Fuss, Deutsche E. Z. xxviii. p. 176.

Melolontha porcina and *variolosa*, Hentz: descriptions reprinted; Bull. Brooklyn Soc. vi. p. 111. *M. vulgaris* and *hippocastani*, Fabr.: metamorphoses, varieties, &c., noticed; Mocsáry, Rov. Lapok, i.

pp. 118-122, xiv., & xv. figs. 31 & 32. *M. vulgaris*, Fabr.: ravages in the forests of Scania; Holmgren, Ent. Tidskr. v. pp. 43-51: on destroying; *Kölnische Zeitung (cf. Ent. Nachr. x. pp. 135-138): monstrosity of left hind leg; Horváth, Rov. Lapok, i. pp. 169, 170; & xxiii. fig. 38.

New genera and species:—

Pseudotrochalus, Quedenfeldt, B. E. Z. xxviii. p. 301. Allied to *Trochalus*. To include *T. chrysomelinus*, Gerst., *rufobrunneus* and *falkensteini*, Kolbe, *Serica rufolineatus*, Har., and *subtruncatus*, Malange, *aericollis*, p. 303, *quadrisignatus*, Quango, p. 304, *nigroseriatus*, p. 305, and *superbus*, Malange, p. 306, spp. nn.

Apterodema, Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 490. Allied to *Liogenys*. Type, *A. acuticollis*, sp. n., t. c. p. 491, Punta Arena.

Phalangosoma, Quedenfeldt, t. c. pp. 318 & 402. Differs from *Elaphocera* by its very long cylindrical body. Type, *P. mechowii*, sp. n., t. c. p. 318, pl. ix. fig. 6, Quango.

Scaphorina, id. t. c. p. 316. Allied to *Leuretra*, &c.; antennæ thirteen-jointed, third joint short; terminal joint of maxillary palpi cylindrical; labrum not concave; front tibiæ tridentate. Type, *S. crinipes*, sp. n., t. c. p. 317, pl. ix. fig. 5, Quango.

Pachypoides, Fairmaire, C.R. ent. Belg. xxviii. p. cxliii. Allied to *Pachypus*. Type, *P. limbipennis*, sp. n., *ibid.*, E. Africa.

Hoplia coralipes, Reitter, Verh. Ver. Brünn, xxii. p. 8, Lirík.

Serica parallela, New Jersey, and *porcula*, Arizona, Casey, Col. N. Am. pp. 176 & 177; *S. sagulata*, *costipennis*, p. 307, *maculipennis*, p. 308, and *fulvicolor*, p. 309, Quedenfeldt, B. E. Z. xlviii., Malange.

Trochalus fallaciosus, Gerstaecker, JB. Hamb. Anst. i. p. 48, Massai; *T. spectabilis*, p. 299, *obtusidens*, p. 300, and *fulvescens*, p. 301, Quedenfeldt, t. c., Malange.

Homaloplia irideomicans, Fairmaire, C.R. ent. Belg. xxviii. p. cxxii., E. Africa.

Carmenta setulifera, Quango, p. 309, *pilosa*, p. 310, *fulviventris*, Malange, and *nigricollis*, Quango, p. 311, Quedenfeldt, t. c.; *C. puerilis*, Gerstaecker, t. c. p. 48, Massai.

Diplostaxis levicula and *popino*, Casey, t. c. pp. 178 & 179, Arizona.

Atys diluta, Quedenfeldt, t. c. p. 315, pl. ix. fig. 4 (details), Malange.

Schizonycha cylindrata, Quango, and *lutescens*, Malange, id. t. c. pp. 314 & 315, pl. ix. figs. 2 & 3 (details); *S. variolicollis*, Fairmaire, t. c. p. cxxii., E. Africa.

Encya strigiscutata, id. S. E. Z. xlv. p. 131, Madagascar.

Pegylis brevior, id. t. c. p. 132, Madagascar.

Empecta semirufa, id. t. c. p. 274, Madagascar.

Lepidiota quinquelineata and *scutellata*, Macleay, P. Linn. Soc. N. S. W. ix. pp. 703 & 704, Macleay Coast, New Guinea.

Lachnoderia rufobubata, Fairmaire, t. c. p. 275, Madagascar.

Lachnosterna subpruinosa, Casey, t. c. p. 38, Atlantic States.

Ancylonycha dohrni, pl. ix. fig. 1, and *intersa*, Quedenfeldt, t. c. pp. 312 & 313, Quango.

Rhizotrogus spartanus, Brenske, Deutsche E. Z. xxviii. p. 77, Sparta; *R. cristatifrons*, Fairmaire, Bull. Soc. Ent. Fr. (6) iii. p. cxxiv., Algeria; Tunis; *R. densaticollis*, Daya, p. lxi., *tripolitanus*, Tripoli, *tuniseus*, pl. lxii., and *dilutus*, Tunis, p. lxiii., *id.* C.R. ent. Belg. xxviii.; *R. validus*, Kraatz, Deutsche E. Z. xxviii. p. 233, Asia Minor.

Elaphocera sulcatula, Fairmaire, *t. c.* p. cxvii., Morocco; *E. nigrata*, *id.* Ann. Soc. Ent. Fr. (6) iv. p. 178, Tripoli.

Brachydema [sic] *lamberti*, *verryi*, Lebanon, p. 177, and *carcelli*, Syria, p. 178, note, *id. t. c.*

Rutelides.

Anisoplia. Synopsis of Hungarian species; Kuthy, Rov. Lapok, i. pp. 205-209 and xxvii. figs. 42-45. *A. monticola*, Er., noticed; Krause, Ent. Nachr. x. pp. 290 & 291. *A. marginata*, Kraatz, discussed; Ragusa, Nat. Sicil. iii. pp. 317 & 318.

Phyllopertha arenaria, Brullé, var. *krueperi* from Greece described; Brenske, Deutsche E. Z. xxviii. p. 77.

Anomala. Horn tabulates and discusses the species which occur in the United States (Tr. Am. Ent. Soc. xi. pp. 157-164): he includes *Rhombonyx* and *Spilota* with *Anomala*, and gives the following synonymy:—*A. flavipennis*, Burm. (= *dichroa*, Mels.), *binotata*, Gyll. (= *unifasciata*, Say, *marginella* and *luteipennis*, Lec.), *minuta*, Burm. (? = *innuba*, Fabr.), *undulata*, Mels. (= *varians*, Fabr., *maculata*, Cast., and *variegata*, Latr.), *lurida*, Fabr. (= *inconstans*, Burm.), and *lucicola*, Fabr. (= *atrata* and *merrens*, Fabr., *pinicola*, Mels., and *nigritula*, Cast.), and *marginata*, Fabr. (= *annulata*, Germ.). *A. luteipennis*, Lec., and *binotata*, Gyll., differentiated; Casey, Col. N. Am. pp. 180 & 181.

Adoretus strigatus, Waterh. (= *vittaticollis*, Fairm.), and *albosetosus*, Waterh. (= *albohispidus*, Fairm.), redescribed; Fairmaire, S. E. Z. xlv. pp. 132 & 133.

New species:—

Anomala oblivia, Horn, Tr. Am. Ent. Soc. xi. p. 163, United States; *A. forbesi*, Bates, P. Z. S. 1884, p. 404, fig. 1, Lower Niger; *A. (Euchlora) tinctiventris*, Quedenfeldt, B. E. Z. xxviii. p. 320, Quango; *A. (Heteroplia) adustula*, Gerstaecker, JB. Hamb. Anst. i. p. 47, Massai.

Popilia atra and *liturata*, Quedenfeldt, *t. c.* p. 322, Quango.

Strigoderma pimalis, Casey, Col. N. Am. p. 181, Arizona.

Plusiotis woodi, Horn, Tr. Am. Ent. Soc. xi. p. xxxi., Texas.

Tribostethes pilicollis, Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 491, Straits of Magellan.

Adoretus pagensteckeri, Gerstaecker, *t. c.* p. 48, Massai; *A. nigratarsis*, Quedenfeldt, *t. c.* p. 322, Malange.

Dynastides.

Pycnoschema scrofa, Har., ♂ described; Quedenfeldt, B. E. Z. xxviii. p. 329, note.

Callienemis latreillii, Lap., noticed from Sicily; Ragusa, Nat. Sicil. iii. p. 318.

Oryctes pechueli, Kolbe. Clypeus, &c., noticed; Quedenfeldt, *t. c.* p. 326, pl. vii. fig. 8 (details).

Xyloryctes satyrus, Fabr. Habits, range, ravages, stridulation, &c., noticed; Hamilton & Hagen, *Canad. Ent.* xvi. pp. 107, 108, 239, & 240.

Strategus julianus, Burm. Larva noticed; Shufeldt, *P. U. S. Nat. Mus.* vii. p. 338.

Xylotrupes dichotomus, Linn. Polymorphism of ♂ described; Von Schönfeldt, *Ent. Nachr.* x. pp. 49 & 50.

Megasoma typhon, Oliv., used as a talisman in Brazil; Engel & Müller, *Ent. Nachr.* x. p. 328.

Phileurus senegalensis, Cast. (= *variosus*, Dej.), noticed; Quedenfeldt, *t. c.* p. 330.

New species :—

Heteronychus simplex, Waterhouse, *Ann. N. H.* (5) xiii. p. 370, China; *H. capreolus* and *geotrupinus*, Quedenfeldt, *B. E. Z.* xxviii. pp. 323 & 325, Quango.

Pycnoschema subulata, *id. t. c.* p. 327, pl. ix. fig. 9, Quango.

Temnorhynchus cribratus, Bates, *P. Z. S.* 1884, p. 405, fig. 2, Lower Niger.

Oryctes mechowii, Quedenfeldt, *t. c.* p. 326, pl. vii. fig. 7 (details), Malange.

Scapanes politus, Macleay, *P. Linn. Soc. N. S. W.* ix. p. 703, New Guinea.

Cyphonistes tuberculifrons, Quedenfeldt, *t. c.* p. 329, Quango.

Cetoniides.

KOLBE, H. J. [See *Coleoptera*, General Subject, *antea*, p. 16.]

List of types of *Cetoniidæ* formerly in the collections of E. Brown and A. Turner, with indications of the collections in which they are at present; O. E. Janson, *Cist. Ent.* iii. pp. 111 & 112.

List of *Goliathidæ* collected by Pogge in West Africa; Kolbe, *B. E. Z.* xxviii. pp. 94 & 95.

Goliathus albosignatus, Boh., ♀ described and details figured; it is distinct from *hirkianus*; Gray, *id. t. c.* pp. 383–386.

Celorrhina, Burm. Table of Central African species; *id. t. c.* pp. 86 & 87. *C. glabrata*, *radei*, *furcata*, *ruficeps*, *poggei*, and *imitatrix*, Kolbe, belong to one species; Kraatz, *B. E. Z.* xxviii. p. 403. (*C. poggei* at least is distinct; Kolbe, *t. c.* p. 404.)

Eudicella poggei, *pauperata*, *wissmani*, and *viridana*, Kolbe, belong to one species; Kraatz, *t. c.* p. 403. (Kolbe reasserts their distinctness; *id. t. c.* p. 404.)

Mecynorrhina torquata, Westw., noticed; Kolbe, *t. c.* p. 93.

Fornasinus peregrinus, Har., is from Pungo Andongo; *id. t. c.* p. 94.

Stephanorrhina guttata, Oliv. Range discussed; *id. t. c.* pp. 96 & 97.

Eccoctocnemis superba, Gerst., and *barthi*, Har., noticed; Kolbe & Quedenfeldt, *B. E. Z.* xxviii. pp. 94 & 331.

Heterorrhina brevicauda, Bates, = *Genyodonta laevipectus*, Raffr.; *H. gratiose*, Ancy, = *Smaragdesthes alternata*, Klug; *Cetonia dohrni*,

Har., = *impavida*, O. E. Jans.; *C. mimula*, Har., = *famelica*, Jans.; *Pachnoda pygmaea*, Kraatz, = *viridana*, Blanch.; and *Diplognathus incoides*, Thoms., = *admixta*, Hope: O. E. Janson, *t. c.* p. 110.

Lomaptera duboulayi, Thomson, figured by Waterhouse, Aid, iii. pl. cxliv. fig. 3.

Leucocelis dysenterica, Boh., and *semicuprea*, Kraatz, *Charadronota pectoralis*, Boh., and *Gnathocera trivialis*, Gerst., noticed; Quedenfeldt, B. E. Z. xxviii. pp. 332, 336, & 382.

Cetonia anovitatta, Chevr., *subviridis*, Newm., *ferruginea*, Gory & Perch., *mandarina*, Weber, and *guerini*, Eyd.: variation discussed; Haller, MT. schw. ent. Ges. vii. pp. 31-33. *C. aurata*, Linn., hibernating; Ellis, Ent. M. M. xxi. p. 36. *C. conspersa*, Ball., varr. *confluens* and *immarginata* from Osch described by Kraatz, Deutsche E. Z. xxviii. pp. 222 & 223.

Protætia mandarina, Web., although a flower-haunting beetle, sometimes attacks hives of *Trigona* in Australia in great numbers; Hockings, Tr. E. Soc. 1882, p. 156.

Valgus canaliculatus, Oliv., and *squamiger*, Beauv. (= *æstivalis*, Beauv., sec. Fitch). Characters, habits, &c., noticed; Hamilton, Canad. Ent. xvi. pp. 105 & 106.

New genera and species :—

Rhynchocephala, Fairmaire, S. E. Z. xlv. p. 134. Allied to *Epixanthia*. Type, *R. hildebrandti*, sp. n., *ibid.*, Madagascar.

|| *Centraspis*, *id.* Bull. Soc. Ent. Fr. (6) iv. p. xxiii. Allied to *Euryomia* and *Erirhipis*. Type, *E. raffrayi*, sp. n., *ibid.*, Abyssinia. (Genus renamed *Centrantyx*; *id. t. c.* p. xxxv.)

Anoplocarpus, Quedenfeldt, B. E. Z. xxviii. p. 338. Allied to *Cænophilus*. Type, *A. marginatus*, sp. n., *t. c.* p. 339, pl. ix. fig. 14, Quango.

Comythovalgus, Kolbe, B. E. Z. xxviii. p. 166. Allied to *Valgus*; upper side with thick and numerous tufts of hair; body short, compressed; front tibiae unequally dentated in both sexes. Type, *C. villosus*, sp. n., *ibid.*, Central Africa (Mukenge?).

Pygovalgus, *id. ibid.* Allied to *Valgus*; pygidium produced, narrowed towards the extremity, which is rounded; body beneath thickly clothed with adpressed scales. To include *P. insignis* and *glabratus*, spp. nn., *ibid.*, Mukenge.

Goliathus russus, Kolbe, B. E. Z. xxviii. p. 386, Congo (stigmata of *G. russus* and of *G. giganteus*, Lam., figured for comparison).

Hypselogenia actæon, Gerstaecker, JB. Hamb. Anst. i. p. 45, Massai.

Cælorrhina glabrata, Mukenge, p. 81, *radei*, figs. 1 & 2, Lualaba, p. 82. *furcata*, *ruficeps*, Mukenge, p. 83, *poggei*, figs. 3-5, p. 84, and *imitatrix*, fig. 6, Lualaba, p. 85, Kolbe, *t. c.*

Eudicella poggei, p. 87, *pauperata*, p. 88, *wissmanni*, and *viridana*, p. 89, *id. t. c.*, Lualaba; *E. trimeni*, O. E. Janson, Cist. Ent. iii. p. 103, Natal.

Megalorrhina poggiana, Kimbundo, p. 91, *mukengiana*, Mukenge, and *prosera*, Kimbundo, p. 92, Kolbe, *t. c.* figs. 7-9.

Plesiorrhina vacua, Gerstaecker, *t. c.* p. 46, Massai.

- Genyodonta palliata*, Gerstaecker, *t. c.* p. 45, Massai ; *G. quadricornis*, O. E. Janson, *t. c.* p. 104, Zambesi.
- Heterorrhina obesa*, *id. ibid.*, Khasia Hills.
- Clinteria hageni*, Ritsema, Notes Leyd. Mus. vi. p. i. Serdang (E. Sumatra) ; *C. revoili*, Fairmaire, C.R. ent. Belg. xxviii. p. cxxiii., E. Africa.
- Electrone polita*, O. E. Janson, *t. c.* p. 107, Nias.
- Macronota alveata*, *id. t. c.* p. 108, Sumatra.
- Stenotarsia punctiventris*, Waterhouse, Ann. N. H. (5) xiv. p. 348, Madagascar.
- Coptomia ventralis*, O. E. Janson, *t. c.* p. 108, Madagascar.
- Pseudineu robusta*, *id. t. c.* p. 109, Gold Coast.
- Gnathocera sericinitens*, Bates, P. Z. S. 1884, p. 405, fig. 3, Lower Niger ; *G. valida*, O. E. Janson, *t. c.* p. 105, Zambesi.
- Scythropesthes tricolor*, *id. t. c.* p. 106, S. Africa (?).
- Pacilopharis uniformis*, Solomon Islands, and *curtisii*, Batchian, Waterhouse, Ann. N. H. (5) xiii. pp. 370 & 371.
- Elaphinis adpersula*, Gerstaecker, *t. c.* p. 46, Massai ; *E. atomosparsa*, Fairmaire, *t. c.* p. lxxiii., E. Africa.
- Somalibia multiguttata*, *id. t. c.* p. cccxvi., E. Africa.
- Glycyphana venusta*, Sumatra, and *saleyeri*, Saleyer, Ritsema, *t. c.* pp. 2 & 3.
- Anoplochilus limbicollis*, Fairmaire, *t. c.* p. cxliii., E. Africa.
- Oxythyrea (Leucocelis) amplicollis*, *id. ibid.*, Zanzibar.
- Leucocelis triliturata*, Quedenfeldt, B. E. Z. xxviii. p. 332, pl. ix. fig. 11, Malange.
- Cetonia apunctata, vermifer*, p. 32, and *pauperata*, p. 33, Haller, MT. schw. ent. Ges. vii. [probably from Sumatra or Philippines].
- Pachnoda chionopleura*, Fairmaire, *t. c.* p. clxiii., Zanzibar ; *P. divisa*, Massai, and *mastrucata*, Lake Naiwascha, Gerstaecker, *t. c.* p. 47 ; *P. rufovirens*, Quedenfeldt, *t. c.* p. 334, Malange.
- Diphrontis gerstaeckeri*, *id. t. c.* p. 335, pl. ix. fig. 13, Malange.
- Protatia engelhardi*, Ritsema, *t. c.* p. 5, Saleyer.
- Æthiessa albocincta*, Kraatz, Deutsche E. Z. xxviii. p. 231, Malatia, Asia Minor, and Caucasus.
- Cymophorus sexfoveatus*, Fairmaire, *t. c.* p. cxliv., Zanzibar.
- Cenochilus kolbei*, Quedenfeldt, *t. c.* p. 337, Quango.

BUPRESTIDÆ.

- Chalcophora virginienensis*, Herbst, *liberta*, Germ., *Dicerca tenebrosa*, Kirb., *Buprestis striata*, Fabr., and *Chrysobothris harrisii*, Hentz, noticed as destructive to white pine ; W. Saunders, Rep. E. Soc. Ont. 1883, pp. 54 & 55, and Rep. Fruit-Growers' Ass. Ont. 1883, pp. 324 & 325.
- Cyphogastra angulicollis*, Deyr., slight variety from Larat noticed ; Waterhouse, P. Z. S. 1884, p. 215. *C. lansbergii*, Gestro, = that of Thomson ; Gestro, Ann. Mus. Genov. xx. p. 304.
- Copnodis tenebrionis*, Linn., *Agrilus angustulus*, Ill., and *Chalcophora mariana*, Linn. Larvæ noticed ; Bargagli, Bull. Ent. Ital. xvi. p. 93.

Buprestis levaillanti, Luc., is distinct from *B. sanguinea*, Fabr. ; Lucas, Bull. Soc. Ent. Fr. (6) iv. pp. xli. & xlii.

Eurythyrea. French species noticed ; Mayet, Bull. Soc. Ent. Fr. (6) iii. p. cxlviii.

Melanophila longipes, Say, troublesome by its bite in Canada ; Harrington, Rep. E. Soc. Ont. 1883, p. 37.

Lamesis, Westw., probably = *Xenorhipis*, Lec. ; Horn, Canad. Ent. xvi. pp. 147 & 148.

Anthaxia marmottani, *Agrilus munieri*, and *Anth. martini*, Bris., appears to be distinct from *Anth. bi-impresa*, *Agr. croceivestis*, Mars., and *Anth. praticola*, Laf., respectively ; the descriptions of the two first pairs of species are placed in parallel columns for comparison : Brisout, Bull. Soc. Ent. Fr. (6) iv. pp. xvii.-xix. (Rejoinder by Marseul, tom. cit. p. xxxiii.)

Anthaxia strigata, Lec., and some allied species, tabulated and described ; Casey, Col. N. Am. pp. 172-175.

Corabus bifasciatus, Oliv. Differences of sexes noticed ; the bodies previously supposed to be eggs prove to be parasitic *Acari* : Laboulbène, C.R. xviii. pp. 539-541, and Ann. N. H. (5) xiii. pp. 308 & 309.

Agrilus granulatus, Say. Life-history ; Burrill, Rep. Ins. Illin. xii. pp. 121 & 122.

Strobilodera, g. n., Fairmaire, C.R. ent. Belg. xxviii. p. lxxii. Allied to *Sphenoptera* ; prosternum wider, and scutellum very broad, truncated. Type, *S. plagifera*, sp. n., t. c. p. lxxiii., E. Africa.

New species :—

Sternocera cariosicollis and *foveopubens*, p. lxxii., and *revoili*, p. cxlv., Fairmaire, C.R. ent. Belg. xxviii., E. Africa ; *S. fischeri*, Gerstaecker, JB. Hamb. Anst. i. p. 51, Aruscha.

Julodis puerilis, id. *ibid.*, N'Guruman ; *J. finchi*, Waterhouse, Ann. N. H. (5) xiv. p. 429, Karachi ; *J. angustior*, Fairmaire, S. E. Z. xlv. p. 142, Madagascar.

Steraspis villosiventris, id. C.R. ent. Belg. xxviii. p. lxxii., E. Africa.

Agelia tricolor and *obtusicollis*, id. t. c. p. lxxiii., E. Africa ; *A. placida*, Gerstaecker, t. c. p. 51, Aruscha.

Chalcotenia lata, Waterhouse, op. cit. xiii. p. 571, Queensland.

Chrysaspis brunneipennis, Fairmaire. t. c. p. lxxii., E. Africa.

Chalcophora procera, id. t. c. p. cxliv., E. Africa.

Cyphogastra splendens, Waterhouse, P. Z. S. 1884, p. 215, pl. xvi. fig. 2, Maroc.

Psiloptera inaequalis and *confossipennis*, Fairmaire, t. c. p. cxliv., E. Africa ; *P. apasia*, Gerstaecker, t. c. p. 52, Aruscha.

Lampra bonnairii, Fairmaire, t. c. p. lxiv., Batna.

Ancylochera corpulenta, id. t. c. p. cxvii., Morocco ; *A. davidis*, id. Ann. Soc. Ent. Fr. (6) iv. p. 168, Akbès.

Anthaxia magdalene, id. Bull. Soc. Ent. Fr. (6) iii. p. cxlv., Turkey ; *A. hackeri*, Frivaldszky, Term. füzetek, viii. p. 281, Buda-Pest ; *A. calligera*, Gerstaecker, t. c. p. 52, Aruscha ; *A. nanula*, p. 174, *simiola* and *aenescens*, p. 175, Casey, Col. N. Am., California.

Stigmodera magellanica, Fairmaire, Ann. Soc. Ent. Er. (6) iii. p. 491, Straits of Magellan.

✓ *Chrysobothris impressifrons*, id. C.R. ent. Belg. xxviii. p. cxlv., E. Africa.

Janthe zanzibarica, id. *ibid.*, Zanzibar.

EUCNEMIDÆ.

Tharops nigriceps, Mannerh., noticed; Frivaldszky, Rov. Lapok, i. pp. 250, 251, & xxx.

Arisis atripennis, sp. n., Macleay, P. Linn. Soc. N. S. W. ix. p. 703, New Guinea.

ELATERIDÆ.

AUBERT, —, & DUBOIS, R. Sur les propriétés de la lumière des Pyrophores. C.R. xcix. pp. 477-479. [*Cf.* J. Sci. (3) vi. pp. 595-597.]

Results of spectroscopic examination. The character of the light differs considerably according to its intensity. As its brightness diminishes, the red and orange rays wholly disappear, and the spectrum is composed of green rays, with a few yellow and blue.

DELING, T. Beitrag zur Metamorphose der Käferfamilie der Elateriden. Fortsetzung und Schluss. Deutsche E. Z. xxviii. pp. 177-216.

Describes the metamorphoses of *Limonium bructeri*, Fabr., *Ampedus lythropterus*, Germ., *sanguinolentus*, Schrauck, *pomorum*, Herbst, *balteatus*, Linn., *nigrinus*, Herbst, *erythrogonus*, Müll., and *Cryptohypnus riparius*, Fabr. A table is added of all the larvæ of *Elateridæ* known to the author, with notes on those described by others.

Notes on 10 *Elateridæ* collected by Weyers in Sumatra; Candèze, C.R. ent. Belg. xxviii. p. cccxxxviii.

Kirsch, B. E. Z. xxviii. pp. 43, 47, & 48, notices varieties of *Semiotus punctatostriatus*, Cand., and *linnei*, Guér., *Pyrophorus tessellatus*, Cand., *Cosmesus electus*, Cand. (var. *pauper* from Colombia), and *Agelasinus viridis*, Cand.

Melanactes (?) and *Asaphes* (?). Luminous larvæ noticed; Shufeldt, P. U. S. Nat. Mus. vii. p. 337, figs.

Cryptohypnus riparius, Fabr., variation, and *Elater* (*Ampedus*) *athiopis*, Lac. (= *scrofa*, Germ.), pupa described; Letzner, JB. schles. Ges. lxi. pp. 304-306.

Alaus oculatus, Linn., with unequally developed elytra; Townsend, Canad. Ent. xvi. pp. 238 & 239.

Hemirhipus apicalis, Cand. (= *elegantissimus*, Cand.), noticed; Berg, An. Soc. Arg. xvi. p. 263.

Pityobius billingsii, Bland, noticed and figured; Tr. Ottawa Nat. Club, i. [1880] p. 61, pl. ii. fig. 2.

Athous undulatus, De Geer, var. *simplicitus* from Chabarofka (Amur) described; Von Heyden, Deutsche E. Z. xxviii. p. 290.

Corymbites melancholicus, Fabr., var. *simplonica* described; Stierlin, MT. schw. ent. Ges. vii. pp. 43 & 44.

New species :—

Agrypnus olcesii, Fairmaire, Le Nat. vi. p. 446, Mogador; *A. gutturosus*, id. C.R. ent. Belg. xxviii. p. cxxiii., E. Africa.

Adelocera pectoralis, id. S. E. Z. xlv. p. 276, Madagascar.

Alaus polyzonus, Gerstaecker, JB. Hamb. Anst. i. p. 52, Massai.

Semiotus singularis, aeneovittatus, Ecuador, p. 44, *supplicans*, p. 45, and *carinicollis*, Colombia, p. 46, Kirsch, B. E. Z. xxviii.

Psephus (?) *protensus*, Gerstaecker, t. c. p. 53, Pangani.

Monocrepidius finitimus, Casey, Col. N. Am. p. 169, New Jersey.

Drasterius fretus, id. t. c. p. 170, Philadelphia.

Deromecus profugus, Kirsch, t. c. p. 46, Colombia.

Pomachilus canaliculatus, id. t. c. p. 47, Colombia.

Athous consors and *jocosus* (Cand., MS.), Von Heyden, Deutsche E. Z. xxviii. pp. 293 & 294, Askold.

Corymbites patruus, id. t. c. p. 294, Vladivostok.

Agriotes australis, Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 492, Punta Arena.

CEBRIONIDÆ.

Cebrio favieri, sp. n., Fairmaire, C.R. ent. Belg. xxviii. p. cxviii., Morocco.

RHIPIDOCERIDÆ.

Callirhipis longicornis, Waterhouse, figured by him; Aid, iii. pl. cxlv. fig. 4.

DASYLLIDÆ.

Scirtes hemisphæricus, Linn., is much more abundant than its allies, owing probably to its power of leaping; Kolbe, B. E. Z. xxviii. p. 393.

Atopida brounei, Sharp, = *Ptenus suturalis*, White; Sharp, N. Z. J. Sci. ii. p. 299.

New species :—

Helodes nebrodensis, Ragusa, Nat. Sicil. iii. p. 335, Sicily; *H. insulanus*, Bourgeois, Rev. d'Ent. iii. p. 283, New Caledonia.

Cyphon pandellei, Bourgeois, Rev. d'Ent. Faun. Gall. Rhén. iv. p. 34, S. France; *C. abeillei*, id. Bull. Soc. Ent. Fr. (6) iv. p. xlii., Jaffa, Tiberias; *C. oceanicus, luteus*, and *longipilis*, id. Rev. d'Ent. iii. pp. 280-282, New Caledonia; *C. antarcticus*, Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 493, Straits of Magellan.

Scirtes caledonicus, Bourgeois, Rev. d'Ent. iii. p. 284, New Caledonia.

Philodactyla australis, id. t. c. p. 278, New Caledonia.

TELEPHORIDÆ.

GORHAM, H. S. *Biologia Centrali-Americana*. [Vide Godman & Salvin: INSECTA, General Subject.] *Coleoptera*, iii. (2) pp. 225-272, pl. xi.

Includes supplement to *Malacodermata* as far as *Aspidosoma*.

Lycides.

Gorham, *Biol. Centr. Am. Col.* iii. (2) pp. 226-249, notices *Lygistopterus* sp., *Lycostomus sommeri*, Gorh., var., *Lucaina schini*, Dugès, *Calopteron divergens*, Gorh., *palpalis*, *costulatum*, Kirsch, *rubrotestaceum*, Bourg., pl. xi. fig. 3, *lineare*, Gorh., var., pl. iv. fig. 5, *terminale*, *socium*, Kirsch, and *miniutum*, *Plateros evanidus* var., *apicalis*, pl. xi. fig. 9, *luridus*, *lateritius*, *terminalis*, *striatus* var., *ochraceus*, *rubricatus*, *patiens*, and *stramineus*, *Calocladen* (previously spelt *Calodadon* in error) *testaceum* and *oculatum*, Gorh.

Identification of several species of *Lycus* named in Dejean's Catalogue; *Emplectus*, Erichs., recharacterized; *Eurrhasus*, C. Waterh., and *Calocladon*, Gorh., are probably synonymous; *Lycus dissimilis*, Best, includes two species: ♀ = *bremei*, Guér., and ♂ = *fastiditus*, Bourg.; Bourgeois, *Bull. Soc. Ent. Fr.* (6) iii. pp. ci., cii., cxlviii., & cxlviii.

Kirsch, *B. E. Z.* xxviii. pp. 48 & 50, notices varieties of *Lygistopterus succinctus*, Latr., and *Calopteron lepidum*, Bourg.

Macrolycus flabellatus, Motsch. (= *Cerceros pectinicornis*, Kraatz), ♀ described; Von Heyden, *Deutsche E. Z.* xxviii. p. 290.

Lygistopterus anorachilus, Ragusa, figured by him; *Nat. Sicil.* iii. pl. iii. fig. 7.

New genera and species :—

Thonalmus (Waterh., MS.), Bourgeois, *Ann. Soc. Ent. Fr.* (6) iii. p. 376. Allied to *Calopteron* (= *Lycide*, gen. 9, Waterh., *Tr. E. Soc.* 1878, p. 98, the type of which is *Lycus bicolor*, Linn.). To include *Lycus militaris*, Schönh. (= *bicolor*, Oliv., and *Calopteron denominatum*, Chevr.), *Cal. dominicensis*, Chevr. (= *bicolor*, Cast., and *Charactus blandus*, Dej. Cat.), *L. bicolor*, Linn., *Cal. suave*, Chevr. (= *Char. elegans*, Dej. Cat.), *Cal. amabilis* and *distinguendus*, Duv., *nigritarsis*, Chevr. (= *bicolor*, Duv.), *alucis* and *elegantulus*, Duv.

Teroplus, Gorham, *Biol. Centr. Am. Col.* iii. (2) p. 243. Allied to *Plateros*, but ♂ with pectinate antennæ. Type, *Calocladon fuscum*, Gorh. (Amended description, *t. c.*; cf. also p. 245.)

Linoptes, *id. t. c.* p. 247. Allied to *Calocladon*; ♂ antennæ only serrate; thoracic carina very finely divided. Type, *L. imbrex*, sp. n., *ibid.* pl. xi. fig. 12, Nicaragua, Panama.

Ceratoprion, *id. t. c.* p. 248. Allied to *Calopteron*, and resembles *Atelius* and *Libnetis*. Type, *C. serricorne*, sp. n., *ibid.*, Panama.

Lycinella, *id. ibid.* Placed after *Ceratoprion*. Types, *L. opaca*,

Guatemala, Panama, and *parvula*, Panama, spp. un., *t. c.* p. 249, pl. xi. figs. 15 & 16.

Lycus intermedius, figs. 2 & 2a, Natal, p. 64, *platypterus*, fig. 3, Arabia, p. 65, and *bocandei*, fig. 4, Senegambia, p. 66, Bourgeois, Ann. Soc. Ent. Fr. (6) iv. pl. iv.; *L. fastiditus* (Dej. Cat.), *id.* Bull. Soc. Ent. Fr. (6) iii. p. cii., Senegal; *L. bourgeoisi*, Fairmaire, C.R. ent. Belg. xxviii. p. lxxiv., E. Africa.

Cautires amabilis, Waterhouse, Ann. N. H. (5) xiii. p. 281, Aru.

Lycostomus angulatus, Guatemala, p. 225, *rusticus*, Mexico, *bucolicus*, pl. xi. fig. 1, Panama, and *sanguineus*, Mexico, p. 226, Gorham, Biol. Centr. Am. Col. iii. (2).

Lygistopterus ceruleus, Guatemala, *latus*, pl. xi. fig. 2, p. 227, and *flammeus*, Panama, p. 228, *id. t. c.*

Lucaina marginata, *id. t. c.* p. 229, pl. xii. fig. 8, Mexico.

Metriorhynchus papuensis, Macleay, P. Linn. Soc. N. S. W. ix. p. 704, Macleay Coast. New Guinea.

Trichalus discretus, Bourgeois, *t. c.* p. 67, Java.

Calopteron planulum, Panama, p. 230, *funestius*, Mexico, *sinuatocolle*, Panama, p. 231, *bifurcatum*, Nicaragua, *suturale*, Panama, p. 232, *simulator*, pl. xi. fig. 4, Guatemala, Panama, *rubricolle*, pl. iv. fig. 4, Mexico, p. 234, *notatum*, fig. 5, Guatemala, Panama, *decipiens*, fig. 7, Costa Rica, Panama, p. 235, *imitator*, fig. 6, pl. xi., Guatemala, Panama, *C. (?) debile*, Panama, and *C. plateroides*, Guatemala, Panama, p. 236, Gorham, *t. c.*; *C. bourgeoisi*, Ecuador, p. 48, *quadrimaculatum*, Bogota, *biplagiatum*, Colombia, p. 49, *lepidulum*, Ecuador, *bisignatum*, p. 50, *nervosum*, morio, p. 51, *flavolineatum*, p. 52, and *fissum*, Colombia, p. 53, Kirsch, B. E. Z. xxviii.; *C. cyanoxanthum*, Bourgeois, Ann. Soc. Ent. Fr. (6) iv. p. 67, pl. iv. fig. 5, Cape of Good Hope.

Plateros hogeanus, Mexico, p. 237, *forreranus*, pl. xi. fig. 8, Mexico, Guatemala, p. 239, *infernus*, Panama, *erebus*, Guatemala, Panama, *carbonarius*, Guatemala, p. 240, *fusiformis*, Guatemala, Panama, and *bugabensis*, Panama, p. 241, Gorham, *t. c.*; *P. waterhousei*, Kirsch, *t. c.* p. 54, Colombia.

Calleros aterrimus, Panama, and *filiformis*, Guatemala, Panama, Gorham, *t. c.* p. 244.

Calocladon chiriquense, Panama, *histrionicum*, Guatemala, Mexico, p. 245, *rubidum*, figs. 13 & 14, *plumosum*, Panama, p. 246, and *ephippium*, figs. 10 & 11, Mexico, Panama, p. 247, *id. t. c.* pl. xi.

Emplectus phenicuroides, Kirsch, *t. c.* p. 53, Colombia.

Calochromus nodicollis, Bourgeois, *t. c.* p. 63, pl. iv. figs. 1 & 1a, Australia.

Lampyrides.

EMERY, C. Untersuchungen über *Luciola italica*, Linn. Z. wiss. Zool. xl. pp. 338-355, pl. xix.

Treats of the external characters of both sexes, with anatomical remarks; the structure of the luminous organs, relative to which the writer points out various inaccuracies of previous writers; the structure of the fat body, and its relation to the luminous layers; the waste of

material, and the physiology of luminosity. The luminous organs differ little in structure, but only in extent, in the two sexes. [Abstract in Arch. Ital. Biol. v. pp. 175-178, woodcuts. Cf. also Bull. Ent. Ital. xv. pp. 327-329, and J. Sci. (3) vi. pp. 599 & 600.]

OLIVIER, E. Essai d'une Révision des espèces européennes et circuméditerranéennes de la famille des Lampyrides. L'Ab. xxii. p. 1-56, pls. i. & ii.

The author divides the *Lampyrides* into three tribes, *Lampyrides* (vrais), *Phosphænidæ*, and *Luciolidæ*.

Gorham, Biol. Centr. Am. Col. iv. (2) pp. 249-271, notices *Lamprocera picta* var., *Hyas angularis* and *semifusca*, *Phanolis ustulatus* and *ochraceus*, Gorh., *Megalophthalmus costatus*, Cast. (= *obsoletus*, Blanch.), *collaris*, Guér., fig. 24, *Æthra despecta* and *brunnipennis*, fig. 19, *Drilolampadius sulcatus* and *scutellaris*, fig. 20, *Lucidota amabilis*, *diaphenura*, and *discolor*, fig. 23, pl. xi., *Photinus meteoralis* var., *perelegans*, *guatemalæ*, *lunicollis*, and *albicauda*, *Pyrectomena striatella*, Gorh., *Cratomorphus dorsalis*, Gyll., and *concolor*, Perty (?), pl. xii. fig. 5, and *Aspidosoma cassideum*, Motsch.

Lampyris splendidula, Linn. The light-producing apparatus continued to emit light for an hour after removal from the body; Kaiser, Anz. Ak. Wien, xxi. pp. 133 & 134, and Ann. N. H. (5) xiv. p. 372. Habits of ♀; Poujade, Bull. Soc. Ent. Fr. (6) iii. p. lxxxvii.

Phosphænus hemipterus, Geoffr., variation noticed; Cornelius, JB. Ver. Elberfeld, vi. p. 37.

Luciola lusitanica, Charp., var. *minor* from Lisbon described; Olivier, L'Ab. xxii. p. 51.

New species :—

Lucidota incompta, fig. 22, *fuscata*, p. 253, *xanthopleura*, fig. 21, pl. xi. p. 254, *tincta*, *sinuatocollis*, *difformis*, Panama, p. 255, *vitricollis*, Guatemala, *chiriquiana*, p. 256, *complanata*, *fenestrata*, p. 257, and *comitata*, Panama, p. 258, Gorham, Biol. Centr. Am. Col. iii. (2).

Photinus incongruus, Guatemala, Panama, p. 258, *ignis-fatuus*, Panama, p. 259, *volcanicus*, Nicaragua, Panama, *infirmus*, Guatemala, Panama, p. 260, *radians*, Panama, p. 261, *flohri*, Mexico, P. (?) *brevicornis*, fig. 9, p. 262, *montanus*, fig. 10, *nigro-limbatus*, p. 263, *moestus*, Guatemala, *eous*, p. 264, *subfuscus*, *armatus*, figs. 2a-c, p. 265, *diurnus*, Panama, p. 266, *championi*, Guatemala, *signaticornis*, Panama, *purulanus*, fig. 1, pl. xii., Guatemala, p. 267, *pusillus* and *minusculus*, Panama, p. 268, *id. t. c.*

Pyrectomena discoidea, *id. t. c.* p. 269, Panama.

Cratomorphus altivolans, pl. xii. fig. 3, p. 270, *ovatus*, pl. xi. fig. 18, Panama, and *fasciatus*, pl. xii. fig. 4, Costa Rica, p. 271, *id. t. c.*; *C. vitreus*, Bourgeois, Rev. d'Ent. iii. p. 287, New Caledonia.

Aspidosoma roseiceps, *id. t. c.* p. 286, New Caledonia; *A. ælianum*, Guatemala, and *physonotum*, Nicaragua, Panama, Gorham, *t. c.* p. 272, pl. xii. figs. 6 & 7.

Nyctophila incisa, Tekke-Turcomania, p. 14, *heydeni*, fig. 4, Balearic Islands, p. 16, Olivier, L'Ab. xxii.

Lampyris mucronata, fig. 7, Algeria, p. 25, *barbara*, Morocco (?), p. 30, *mutabilis*, Algeria and Balearic Islands, p. 31, *id. t. c.*; *L. (Pelania) scutellata*, Fairmaire, Bull. Soc. Ent. Fr. (6) iv. p. xxxv., Tunis.

Lamprorhiza paulinoi, Olivier, *t. c.* p. 34, fig. 9, Portugal.

Phosphænus rougeti, *id. t. c.* p. 42, fig. 12, Dijon.

Lampyroidea nigrescens, *id. t. c.* p. 45, Syria.

Luciola judaica, *id. t. c.* p. 48, fig. 19, Syria; *L. galactopyga*, Fairmaire, C.R. ent. Belg. xxviii. p. cxlv., Zauzibar; *L. caledonica* and *antipodium*, Bourgeois, Rev. d'Ent. iii. p. 285, New Caledonia.

Telephorides.

Podistrina doriae, Fairm. Amended description; Bourgeois, Bull. Soc. Ent. Fr. (6) iv. pp. xxi.-xxiii.

Spherarthrum, g. n., Waterhouse, Ann. N. H. (5) xiii. p. 281. Allied to *Anisotelus*, but differing in form, and with the antennæ not enlarged at apex, and widely separated at base. Type, *Telephorus præustus*, Guér.

New species :—

Telephorus approximans, Akbès, *acutangulus*, Syria, p. 169, and *fissicollis*, Lebanon, p. 179, Fairmaire, Ann. Soc. Ent. Fr. (6) iv.

Rhagonycha xanthochroina [sic], *id. t. c.* p. 180, Lebanon; *R. croceipennis*, *id. C.R. ent. Belg.* xxviii. p. cxix., Morocco.

Armidia nobilissima, Reitter, Deutsche E. Z. xxviii. p. 78, Taygetus.

Malthinus impressicollis, *pallidipes*, pl. lx, *maculiventris*, *crucicellis*, p. lxi., and *atroapterus*, p. lxii., Fairmaire, *t. c.*

Malthodes lunifer, Czwalińska, Deutsche E. Z. xxviii. p. 272, Königsberg; *M. oceanica*, Bourgeois, Rev. d'Ent. iii. p. 288, New Caledonia.

Drilides.

Drilus funebris, sp. n., Reitter, Deutsche E. Z. xxviii. p. 79, Attica.

Melyridæ.

Attalus semitogatus, Fairm., noticed; Ragusa, Nat. Sicil. iii. p. 318.

Endeodes, Leconte. Description reprinted; Bull. Brooklyn Soc. vi. p. 136.

Acanthocnemus, Perr., has priority over *Pristoscelis*, Lec.; Bourgeois, Rev. d'Ent. iii. p. 289, note.

Henicopus paulinoi, sp. n., *id.* Bull. Soc. Ent. Fr. (6) iv. p. lxiiv., Portugal.

Acanthocnemus fauveli, sp. n., *id.* Rev. d'Ent. iii. p. 289, New Caledonia.

Danacæa incana, Reitter, Deutsche E. Z. xxviii. p. 256, Dalmatia, Herzegovina; *D. (?) rufotibia*, Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 493, Punta Arena: spp. nn.

Aphyctus brenskæi, sp. n., Reitter, *t. c.* p. 80, Greece.

Dasytiscus emgei, sp. n., *id. t. c.* p. 79, Attica.

Phlaophilus flavopictus, sp. n., Fairmaire, C.R. ent. Belg. xxviii. p. cxviii., Morocco.

CLERIDÆ.

Clerus substriatus, Gehl., *rufipes*, Brahm, and *formicarius*, Linn., differentiated; Weise, Deutsche E. Z. xxviii. p. 426.

Trichodes ammius, Fabr. Larva parasitic in egg-cases of grasshoppers in Spain; Lichtenstein & Graells, Bull. Soc. Ent. Fr. (6) iii. p. xcvi.

Necrobia, Oliv. (type, *cœrulea*, De Geer, = *violacea*, Oliv., nec Linn.), = *Corynetes*, auct.; and *Corynetes*, Herbst (type, *violacea*, Linn.) = *Necrobia*, auct.: Bergroth, B. E. Z. xxviii. p. 229.

Opilo vestitus, N'Guruman, and *rudis*, Massai, spp. nn., Gerstaecker, JB. Hamb. Anst. i. p. 53.

PTINIDÆ.

REITTER, E. Bestimmungs-Tabellen der europäischen Coleopteren. xi.

Bruchidæ (*Ptinidæ*). Verh. Ver. Brünn, xxii. pp. 295-323.

Two subfamilies, *Gibbiini* and *Bruchini*, are admitted.

Anobium domesticum, Fourcr. (*striatum*, Ol.), and *Xestobium tessellatum*, Fabr. (Death Watch); Fowler, Ent. xvii. pp. 188-190. *Ptinus fatidicus*, Linn. (= *Anobium tessellatum*, Fabr.), and *X. tessellatum*; Websdale & Bisshopp, pp. 236-238. Note on Death Watch; Clifford, p. 167. *A. tessellatum*, Fabr., discussed; Savard, Bull. Insect. Agric. ix. pp. 65-70.

Gibbium scotias, Fabr., found in a box of cayenne pepper at Cairo; Lucas, Bull. Soc. Ent. Fr. (6) iv. pp. lxxvi. & lxxvii. Larva described; *id.* t. c. pp. cxxiv. & cxxv. (cf. also Bellevoye, Bull. Soc. Metz (2) xvi. pp. 5-7).

Niptus holeleucus, Fald., noticed as new to Silesia; Schneider, J. E. Ver. schles. (2) ix. p. xxxii.

Theca. Table of known species; Reitter, Deutsche E. Z. xxviii. pp. 86 & 87.

Ptinus fur, Linn., and *secpunctatus*, Panz. Larvæ infesting old nests of *Vespa crabro* and *Chalicodoma muraria* respectively: Bargagli, Bull. Ent. Ital. xvi. pp. 92 & 93.

Bruchus forticornis, Reitt. (= *crassicornis*, Kies.), pl. ii. figs. 18 & 18a, and *corticinus*, Rottenb. (= *brunneus*, Duft.), noticed; Reitter, t. c. p. 83.

New genera and species:—

Pseudoptinus, Reitter, Deutsche E. Z. xxviii. p. 81. Subgenus of *Bruchus* (*Ptinus*, auct.). To include *P. capellus* and *kutzenschachi*, Reitt., *lichenum*, Marsh., *coarcticollis*, Sturm, and the following new species:—*P. subaraneus*, Morea, Syria, pp. 81 & 82, *micans*, Svanetia, p. 81, *nikitanus*, Montenegro, *arragonicus*, Arragon, and *tauricus*, Crimea, p. 82; and *P. lederi*, *id.* Verh. Ver. Brünn, xxii. p. 305, Lenkoran.

Niptodes, *id.* Verh. Ver. Brünn, xxii. p. 209 (= *Microniptus*, Kies., nec

Voll.). Allied to *Paraniptus*; scutellum distinct, round, or triangular. To include *Niptus minimus*, Heyd., *carbonarius*, Rosenh., *elongatus*, Boield., *rotundicollis*, Luc., and *N. nobilis*, Sicily, *ferrugineus*, Spain, p. 300, and *rotundipennis*, Morocco, p. 301, spp. nn.

Pseudoniptus, Reitter, *t. c.* p. 298. Allied to *Niptus*; eyes round, distinctly projecting. Types, *P. globipennis* and *ovipennis*, spp. nn., *t. c.* pp. 299 & 300.

Eurostodes, *id. t. c.* p. 299. Allied to *Eurostus*; scutellum wanting, 2nd joint of antennæ distinctly longer than the 3rd. Type, *E. quisquiliarum*, Baudi.

Bruchoptinus, *id. ibid.* Subgenus of *Bruchus*. To include *B. rufipes*, Fabr., *italicus*, Arrag., *biformis* and *brevivittis*, Reitt., *pellitus*, Desbr., and *femoralis*, sp. n., *t. c.* p. 306, Algiers.

Heteroptinus, *id. t. c.* p. 305. Subgenus of *Bruchus*. To include *Ptinus obesus*, Luc., *affinis*, Desbr., and *H. tasalis* and *kiesenwetteri*, spp. nn., *t. c.* p. 314, Greece.

Bruchus meisteri, Caucasus, p. 309, *argolisanus*, Morea, p. 310, *vittiger*, Austria, Caucasus, p. 311, *perrini*, Marseilles, p. 312, *desbrochersi*, Corsica, p. 313, Reitter, Verh. Ver. Brünn, xxii.; *B. (Heteroplus) kiesenwetteri*, fig. 19, *B. (H.) tarsalis*, fig. 19, pl. ii., Greece, p. 84, *B. (Eutaphrus) canaliculatus*, Greece, Turkey, and *B. (E.) lesinæ*, Lesina, p. 85, *id.* Deutsche E. Z. xxviii.

Gibbium longicorne, Syria, and *laevigena*, Caucasus, Persia, *id.* Verh. Ver. Brünn, xxii. p. 296.

Lasioderma punctulata, *id.* Deutsche E. Z. xxviii. p. 254, Haifa.

Theca curimoides, Greece, *puncticollis*, p. 86, *dorcatomoides*, Haifa, *remota*, Sicily and Syria, p. 87, *id. t. c.*

Cyphoderes schlerethi, *id.* Verh. Ver. Brünn, xxii. p. 317, Greece.

Eutaphrus albipilis, Spain, p. 318, *frivaldszkyi*, Crete, Syria, *canaliculatus*, Greece, *lesinæ*, Lesina, p. 319, *damascenus*, Sarepta, Baku, Syria, *ganglbaueri*, Syria, p. 320, and *globipennis*, Algiers, p. 321, *id. t. c.*

BOSTRYCHIDÆ.

Apate coronata and *sericans*, Marseul, Nouv. et faits, ii. p. 183, Algeria; *A. (Bostrychus) ludovici*, Fairmaire, Bull. Soc. Ent. Fr. (6) iii. p. cxxxiii., Gaboon: spp. nn.

Bostrychus æqualis, sp. n., Waterhouse, P. Z. S. 1884, p. 215, pl. xvi. fig. 3, Maroe.

CIOIDÆ.

Lycus parvulus, sp. n., Casey, Col. N. Am. p. 175, Arizona.

Cis bilamellatus, Wood, Ent. M. M. xxi. p. 130 (*cf.* also p. 147), West Wickham; *C. alnoides*, Reitter, Deutsche E. Z. xxviii. p. 120, Corfu, Lenkoran; *C. setifer*, *id.* Verh. Ver. Brünn, xxii. p. 8, Lenkoran: spp. nn.

Ennearthron californicum, California, and *unicolor*, Long Island, spp. nn., Casey, *t. c.* pp. 36 & 37.

TENEBRIONIDÆ.

CHAMPION, G. C. *Biologia Centrali-Americana*. [Vide Godman & Salvin : INSECTA, General Subject.] *Colcoptera*, iv. (1) pp. 1-88, pls. i.-iii. Includes the commencement of *Heteromera*, as far as *Elavodes*.

Zophosides.

Zophosis callosa, Gerstaecker, JB. Hamb. Anst. i. p. 54, Massai; *Z. nivosa*, Dohrn, S. E. Z. xlv. p. 40, Turkestan : spp. nn.

Erodiides.

Arthrodeis opaculus, Morocco, p. cxix., *laxepunctatus*, *nitidiventris*, and *ruguliventris*, E. Africa, p. cxxiii., spp. nn., Fairmaire, C.R. ent. Belg. xxviii.

Adesmides.

Dohrn, S. E. Z. xlv. pp. 46 & 180-184, notices *Adesmia candidipennis*, Brême, *langi*, Guér., *tuberculatus*, Boh. (?), and *Metriopus nassatus*, Erichs.

Metriopus hottentotta, sp. n., Dohrn, t. c. p. 184, S. Africa.

Epiphysides.

Epiphysa flavicollis, Fabr., noticed; Dohrn, S. E. Z. xlv. p. 179.

Tentyriides.

Triorophus rugiceps, Lec., = *laevis*, Lec., and *Eurymetopon aborme*, Lec., = *rufipes*, Esch.; Champion, Biol. Centr. Am. Col. iv. (1) pp. 2 & 7.

Mesotenopa tricostata, All., = *carinata*, Gestro; Gestro, Ann. Mus. Genov. xx. pp. 304 & 305.

New genera and species :—

Mesabutes, Champion, Biol. Centr. Am. Col. iv. (1) p. 3. An aberrant form, which may be known from its allies in the *Thinobatini* and *Gnathosiini*, Horn, by its very broad head. Type, *M. latifrons*, sp. n., *ibid.* pl. i. fig. 3, Mexico.

Pescennius, *id. ibid.* Allied to *Eurymetopon*, &c. Type, *P. villosus*, sp. n., t. c. p. 4, pl. i. fig. 6, Mexico.

Semias, *id. t. c. p. 4.* Allied to *Trionyitis*. Type, *S. minuta*, sp. n., *ibid.* pl. i. fig. 5, Mexico.

Mencheres, *id. t. c. p. 5.* Allied to *Emmenastus*. To include *M. nicaraguensis*, Nicaragua, p. 5, and *M. elongatus*, pl. i. fig. 4, Guatemala, p. 6, spp. nn., t. c.

Posides, *id. t. c. p. 6.* Has a superficial resemblance to *Helops*. Type, *P. dissidens*, sp. n., *ibid.* pl. i. fig. 2, Mexico.

Trientoma mexicana and *rugifrons*, pl. i. fig. i., Champion, Biol. Centr. Am. Col. iv. (1) p. 2, Mexico.

Apolites (= *Anisocerus*, Fald., and *Ceratanisus*, Gemm.) *allardi*, Reitter, Deutsche E. Z. xxviii. p. 88, Greece.

Homala integricollis and *agona*, Fairmaire, C.R. ent. Belg. xxviii. p. lxxiv., E. Africa.

Rhytinota angulicollis and *oxyoma*, *id. t. c.* pp. cccxlii. & cccxlvii., E. Africa.

Mesostenopa sericea and *infima*, *id. t. c.* pp. cccxlii., E. Africa.

Emmenastus ellipticus, Mexico (?), and *vicinus*, California, p. 8, note, *chiriquensis*, fig. 9, Panama, Colombia, *longicornis*, Guatemala, p. 9, *variabilis*, Mexico, Honduras, *canaliculatus*, fig. 10, *brevipennis*, p. 10, *solitarius*, Mexico, *belti*, Nicaragua, *rotundicollis*, p. 11, *parallelus*, Mexico, *intermedius*, Guatemala, Honduras, *tenebrosus*, Mexico, p. 12, *alatus*, *salvini*, Guatemala, *ambiguus*, Panama, p. 13, *guatemalensis*, Guatemala, *foveicollis*, fig. 11, Guatemala, Nicaragua, Costa Rica, p. 14, *confusus*, Guatemala, *levicollis*, Panama, *mancus*, Mexico, p. 15, *glabratus*, fig. 8, *curtus*, *lentus*, p. 16, *rugicollis*, *pulvinatus*, *picipes* (Chevr., MS.), Mexico, p. 17, Champion, *t. c.* pl. i.; *E. nanulus*, Casey, Col. N. Am. p. 45, California.

Eurymetopon brevicolle, Champion, *t. c.* p. 7, pl. i. fig. 7, Mexico; *E. piceum*, p. 40, *emarginatum*, p. 41, *papagonum*, p. 42, *carbonatum*, p. 43, *sculptile* and *dubium*, p. 44, Casey, *t. c.*, Arizona.

Epitragides.

Epitragus aurulentus, Kirsch, noticed and figured; Champion, Biol. Centr. Am. Col. iv. (1) p. 23, pl. i. fig. 19.

Tydeolus, g. n. (F. Bates, MS.), Champion, Biol. Centr. Am. Col. iv. (1) p. 37. Allied to *Schenicus*. To include *T. atratus* (Bates, MS., type), *tibialis*, and *singularis*, spp. nn., *ibid.*, Mexico.

New species:—

Epitragus sallwei (Haag, MS.), Mexico to Peruvian Andes, *emarginatus*, Panama, *nigricans*, fig. 18, Panama, Colombia, p. 24, *bicarinatus*, figs. 21 & 22, Mexico, p. 25, *ornatus*, fig. 20, *hagei*, *angusticollis*, p. 26, *littoralis*, *rorulentus*, p. 27, *incisus*, *scutatus*, p. 28, *foveatus*, *metallicus*, Mexico, p. 29, *chevolati*, Mexico, Guatemala, Nicaragua, p. 30, *grandis*, Mexico, *acutangulus*, Guatemala, *plicatus*, fig. 23, Mexico, p. 31, *inaqualis*, *micans*, Mexico, *guatemalensis*, British Honduras, Guatemala, Costa Rica, p. 32, *aurichalceus*, *aratus*, p. 33, *parviceps*, *canus*, *pilosus*, Mexico, *cupreus*, fig. 24, Guatemala, Nicaragua, Costa Rica, p. 34, *lucidus*, *obovatus*, Mexico, p. 35, *godmani*, fig. 25, pl. i., Panama, and *communis*, Mexico, British Honduras, Guatemala, p. 36, Champion, Biol. Centr. Am. Col. iv. (1) pl. i.; *E. ovalis*, Casey, Col. N. Am. p. 184, Texas.

Schenicus oculatus, fig. 14, Panama, *panamensis*, fig. 15, Costa Rica, Panama, p. 18, *salvini* (Bates, MS.), Guatemala, Costa Rica, *viridis*, Mexico, Guatemala, *rufipes* (Haag, MS.), Nicaragua, p. 19, *impressus*, Costa Rica, *chalybeus* (Deyr., MS.), fig. 16, *difficilis* (Bouc., MS.), p. 20, *basalis*, Mexico, *niger*, Guatemala, *pectoralis*, fig. 17, Mexico, p. 21, *restitus*, Mexico, and *yucatanensis*, Mexico, p. 22, Champion, *t. c.* pl. i.

Zopherides.

Zopherus, Champion, Biol. Centr. Am. Col. iv. (1) pp. 38–43, notices the following synonymy, &c., and describes varieties, as under, from

Mexico :—*Z. chiliensis*, Guér. (= *bremei*, Guér.), *mexicanus*, Sol. (= *jourdani*, Sallé), variation noticed, *levicollis*, Sol., var. *venosus*, *nodulosus*, Sol. (= *variolosus*, Sturm.), var. *sallai* (Deyr., MS.); *Z. haldemanni* (Sallé, MS.), Horn, var. *verrucosus*, pl. ii. fig. 5, and *Z. nervosus*, Sol. (= *pectoralis*, Lec., var. (?) *reticulatus* (Sallé, MS.)).

Nosoderma morbillosum, Sol. (= *vicinum*, Sol.), noticed; Champion, t. c. p. 48.

Zopherus jansonii (Bates, MS.), fig. 2, Nicaragua, Costa Rica, p. 39, *costaricensis*, fig. 1, Costa Rica, p. 40, *tuberculatus*, fig. 3, *maculatus*, p. 41, *angulicollis*, fig. 6, p. 42, and *compactus*, fig. 4, Mexico, p. 44, spp. nn., Champion, Biol. Centr. Am. Col. iv. (1) pl. ii.

Nosoderma æquale, fig. 14, p. 44, *asperatum*, fig. 9, Mexico, *venustum*, fig. 7, Guatemala, p. 45, *lutosum*, fig. 8, Mexico, *zunilense*, fig. 10, Guatemala, p. 46, *guatemalense*, fig. 11, British Honduras, Guatemala, *interruptum*, Mexico, p. 47, *insigne*, fig. 13, *carinatum*, Mexico, p. 48, *exsculptum*, Mexico, p. 49, *anceps*, Mexico, *impressum*, Mexico, and *sparsum*, fig. 12, Guatemala, p. 50, spp. nn., id. t. c. pl. ii.

Stenosides.

Dichillus modestus, *distinguendus*, *castanescens*, p. lxvi., and *myrmecophilus*, p. lxxvii., spp. nn., Fairmaire, C.R. ent. Belg. xxviii., Algeria.

Akisides.

Akis obstituber, Marseul, Nouv. et Faits, ii. p. 182, Cyrene; *A. kobelti*, Von Heyden, Deutsche E. Z. xxviii. p. 172, Morocco; *A. cordicollis* [sic], Fairmaire, Le Nat. vi. p. 446, Casablanca: spp. nn.

Scaurides.

Scaurus striatus, Fabr., var. *sardous* from Sardinia described; Costa, Rend. Acc. Nap. xxiii. p. 168.

Scaurus bougonii, sp. n., Fairmaire, Bull. Soc. Ent. Fr. (6) iii. p. cxxv., Tunis.

Cryptoglossa mexicana, sp. n., Champion, Biol. Centr. Am. Col. iv. (1) p. 73, pl. iii. fig. 21, Mexico.

Blaptides.

Blaps mortisaga, Linn. (?), noticed from W. Virginia: Hamilton, Canad. Ent. xvi. pp. 37 & 38.

Elaeodes. A highly-offensive secretion emitted by many N. American species, which is discharged in a peculiar attitude, assumed even by *E. tricotata*, Say, which emits no fluid; Williston, Psyche, iv. pp. 168 & 169. *E. quadricollis*, Lec., supposed to be injurious to grape-vines in California; Cooke & Riley, Bull. Dep. Agric. Ent. iv. p. 90. Champion, Biol. Centr. Am. Col. iv. (1) pp. 77-88, notices and figures *E. eschscholtzi*, Sol., pl. iii. fig. 24, *spinipes*, Sol., pl. iv. fig. 2, *blaptoides*, Eschsch., *hispidulabris*, Say (= *lecontei*, Har., *sulcata*, *convexa*, and ? *nupta*, Lec.), *obscura*, Say (= *dispersa*, *deleta*, and *urata*, Lec., and *sulcipenni*, Mann.), *extricata*, Say (= *æquata*, Say), *quadricollis*, Eschsch. (= *omissa* and *vicina*, Lec.),

alutacea, Sol. (= *maillei*, Sol., ? varr., *Blaps aequalis* and *obliterata*, Say), *maura*, Say (?) (= *elongatula*, Sol., nec Eschsch.), figs. 4 & 5, *rotundicollis*, Eschsch. (? = *parva*, Say), figs. 6 & 7, pl. iv., *carbonaria*, Say (= *soror*, *immunis*, and var. *debilis*, Lec.), *longicollis*, Lec. (= *heydeni*, Lec.), *ruida*, Say (= *coriacea*, Sol.), pl. iii. fig. 25, *angusta*, Eschsch., fig. 12, and *laevigata*, Sol., fig. 19, pl. iv.

Embaphion muricatum, Say, is a cellar-insect in Nebraska, like *Blaps*; Schwarz, Am. Nat. xviii. p. 76.

Elæodes exarata, fig. 3, p. 78, *scapularis* (Sturm., MS.), p. 81, *curta*, fig. 8, p. 82, *sulcatula*, fig. 9, *dilaticollis*, fig. 10, p. 83, *ponderosa*, fig. 11, p. 84, *glabricollis*, p. 85, *sonora*, fig. 13, p. 85, *chihuahuensis*, fig. 14, *calcarata* (Sturm, MS.), fig. 15, *montana*, p. 86, *erratica*, fig. 16, *longicornis*, fig. 17, p. 87, *hepburni* and *forreri*, fig. 18, p. 88, Champion, Biol. Centr. Am. Col. iv. (1) pl. iv, Mexico; *E. arcuata*, Casey, Col. N. Am. p. 47, Arizona: spp. nn.

Asidides.

Asida mexicana, Sol. (= *Pelecyporus pistrinarius*, Sol.), and *blapsoides*, Sol. Variation noticed; Champion, Biol. Centr. Am. Col. iv. (1) pp. 53 & 63.

New genera and species :—

Tisamenes, Champion, Biol. Centr. Am. Col. iv. (1) p. 64. Allied to *Asida*; but limbs stouter, head deflexed, &c. Type, *T. truquii*, sp. n., *ibid.* pl. ii. fig. 15, Mexico.

Uculegon, *id. t. c.* p. 65. Allied to *Asida*. Type, *U. pulchellus*, sp. n., *ibid.* pl. ii. fig. 17, Mexico.

Sicharbas, *id. t. c.* p. 67. Allied to *Astrotus*. Type, *S. lobatus*, sp. n., *ibid.* pl. ii. fig. 23, Mexico.

Zamolxis [sic], *id. t. c.* p. 70. Allied to *Asida*. Type, *Z. dilatatus*, sp. n., *ibid.* pl. ii. fig. 14, Mexico.

Poliorectes, *id. ibid.* Allied to *Asida*, *Platesthes*, and *Ologlyptus*. Type, *P. platestheides*, sp. n., *t. c.* p. 71, pl. ii. fig. 25, Mexico.

Orinthis, *id. t. c.* p. 72. Allied to *Branchus* and *Nyctelia*. Type, *O. praocioides*, sp. n., *ibid.* pl. iii. fig. 23, Mexico.

Asida basiplicata, Von Heyden, Deutsche E. Z. xxviii. p. 360, Sierra d'España; *A. rugosissima*, fig. 1, *interrupta*, *funesta*, p. 53, *clathrata* (Sallé, MS.), fig. 2, Mexico, p. 54, *forreri*, fig. 3, *tristis*, *suturalis*, fig. 4, p. 55, *longipennis*, fig. 5, *induta*, fig. 6, *guanaquatusensis*, p. 56, *scutellaris*, *fallax*, fig. 8, p. 57, *laticollis*, fig. 7, *favosa*, *similata*, p. 58, *dissimilis*, fig. 10, *palmeri*, fig. 12, p. 59, *lata*, fig. 18, *marginicollis*, fig. 16, *villosa*, fig. 13, p. 60, *pubescens*, *difficilis*, fig. 11, p. 61, *thoracica*, *rufipes*, fig. 11, *umbrosa*, fig. 17, p. 62, *blanda*, fig. 19, p. 63, and *sphaericollis*, fig. 15, Mexico, p. 64, Champion, Biol. Centr. Am. Col. iv. (1) pl. iii.

Astrotus debilis, fig. 22, *limosus*, fig. 21, p. 66, *seticornis*, fig. 20, and var. *humeralis*, p. 67, *id. t. c.* pl. ii., Mexico.

Ologlyptus canus, p. 68, *sinuaticollis*, fig. 19, *bicarinatus*, fig. 18, and *planatus*, fig. 16, p. 69, *id. t. c.* pl. ii., Mexico.

Pimeliides.

Pimelia valida, Erichs., noticed; Lucas, Bull. Soc. Ent. Fr. (6) iv. p. lvi.

Pimelia akbesiana, Fairmaire, Ann. Soc. Ent. Fr. (6) iv. p. 170, Akbès; *P. prophettei*, *latastei*, Algeria, p. x., *pilifera*, p. xi., *confusa*, Algeria and Tunis, *semiopaca*, Algeria, p. xxiv., and *cultrimargo*, Egypt, (or ?) Kordofan, p. xxv., Sénac, Bull. Soc. Ent. Fr. (6) iv. : spp. nn.

Molyridæ.

Psammodes pierreti, Amyot, noticed; Dohrn, S. E. Z. xlv. p. 178.

Praocis silphomorpha, Fairm., = *bicarinata*, Burm.; Berg, Bull. Soc. Ent. Fr. (6) iv. p. xcviii.

Platesthes silphoides, Waterh., redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 496.

Eusattus nitidipennis, Lec., noticed and figured; Champion, Biol. Centr. Am. Col. iv. (1) p. 75, pl. iii. fig. 22.

Melanolophus septemcostatus, Fairm., = *picteti*, Haag; Gestro, Ann. Mus. Genov. xx. p. 305.

New genera and species :—

Sepidiostenus, Fairmaire, C.R. ent. Belg. xxviii. p. lxxv. Allied to *Sepidium*. Type, *S. erinaceus*, sp. n., *ibid.*, E. Africa.

Sepidiacis, *id. t. c.* p. cxlvi. Allied to *Sepidium*. Type, *S. compressa*, sp. n., *ibid.*, E. Africa.

Psammodes acuticosta, Fairmaire, C.R. ent. Belg. xxviii. p. lxxiv., E. Africa.

Phrynocolus sexcostatus, Gerstaecker, J.B. Hamb. Anst. i. p. 54, Massai; *P. transversus*, Fairmaire, *t. c.* p. lxxiv., E. Africa.

Sepidium longehirtum and *aper*, *id. t. c.* p. lxxv., E. Africa; *S. furciferum*, *spiculolum*, and *bulbiferum*, Gerstaecker, *t. c.* p. 55, Massai.

Praocis striolicollis, p. 494, *silphomorpha*, p. 495, *denseciliata*, Patagonia, p. 508, and *compacta*, Buenos Aires, p. 509, Fairmaire, Ann. Soc. Ent. Fr. (6) iii.

Platyolmus uspallatensis, Mount Uspallate, and *spinicollis*, Tucuman, *id. t. c.* pp. 507 & 508.

Eusattus brevis and *depressus*, pl. iv. fig. 1, Champion, *t. c.* p. 75, Mexico.

Coniontis elliptica, Casey, Col. N. Am. p. 46, California.

Crypticus platensis, Fairmaire, *t. c.* p. 510, Missiones and Monte Video.

Pedinides.

Platyscelis difficilis, Kraatz, ♂ described by him; Deutsche E. Z. xxviii. p. 223.

Isocerus purpurascens, Herbst, is distinct from *ferrugineus*, Fabr.; Reitter, Wien. ent. Z. iii. p. 144.

Platyscelis acutangula and *longicollis*, spp. nn., Kraatz, Deutsche E. Z. xxviii. p. 224, Osch.

Pandarinus ruficornis, sp. n., Reitter, Deutsche E. Z. xxviii. p. 87, N. Morea.

Litoborus sternalis, sp. n., Fairmaire, Le Nat. vi. p. 446, Casablanca.

Blapstinus pimalis, Casey, Col. N. Am. p. 185, Arizona; *B. (?) metallescens*, Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 511, Buenos Aires: spp. nn.

Opatrides.

Pseudonomus, g. n., Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 510. Allied to *Opatrum* and *Lichenum*. Type, *P. dermestiformis*, sp. n., t. c. p. 511, Monte Video.

Halonomus variolatus, sp. n., Allard, Wien. ent. Z. iii. p. 248, Syria.

Micrositus decurtatus, sp. n., Fairmaire, C.R. ent. Belg. xxviii. p. cxx., Morocco.

Trachyscelides.

Anemia sardus, Gené, *rotundicollis*, Desbr., and a new Syrian species, described; Reitter, Deutsche E. Z. xxviii. pp. 259 & 260.

Cherodes latus, Broun, figured by Waterhouse, Aid. iii. pl. cxlix. fig. 1:

Bolitotherus bifurcus, Fabr., ♂ characters; Hayward, Psyche, iv. p. 160.

Anemia asperula, sp. n., Reitter, Deutsche E. Z. xxviii. p. 260, Haifa.

Diaperides.

Hoplocephala quadricornis, sp. n., Reitter, Verh. Ver. Brünn, xxii. p. 8, Lenkoran.

Platydemia obscuratum, Missiones, and *inpressifrons*, Monte Video, Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 512; *P. pernigrum*, Arizona, *parvulum* (? = *excavatum*, Say, cf. p. 195), Long Island, and *opaculum*, Pennsylvania, Casey, Col. N. Am. pp. 49-51: spp. nn.

Pentaphyllus nitidulus, sp. n., Reitter, t. c. p. 8, Lenkoran.

Ulomides.

Eutochia quadricollis, sp. n., Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 512, Missiones.

Diedes (?) *atroclavatus* and *oblongulus*, spp. nn., id. S. E. Z. xlv. p. 140, Madagascar.

Corticeus basalis, Reitter, Verh. Ver. Brünn, xxii. p. 9, Lenkoran, &c.; *C. fusciventris*, id. Deutsche E. Z. xxviii. p. 256, Herzegovina, Ragusa: spp. nn.

Anthracias amurensis, sp. n., Von Heyden, Deutsche E. Z. xxviii. p. 295, Vladivostok.

Cossyphides.

Cossyphus costulicollis, sp. n., Fairmaire, C.R. ent. Belg. xxviii. p. cxlvi., E. Africa.

Endostomus plicicollis, sp. n., id. *ibid.*, E. Africa.

Tenebrionides.

Upis ceramoides, Linn. Size noticed; Dohrn., S. E. Z. xlv. p. 283.

Nyctobates mechowi, sp. n., Kolbe, B. E. Z. xxviii. p. 189, pl. i. fig. 4, Quango.

Dolichoderus laticornis, sp. n., Fairmaire, S. E. Z. xlv. p. 135, Madagascar.

Pediris subopacus, sp. n., Waterhouse, P. Z. S. 1884, p. 216, Maroe.

Heterotarsides.

Phymatodes ater, sp. n., Leconte, Bull. Brooklyn Soc. vii. p. 100, Buffalo.

Pycnocerides.

Pycnocerus cæruleus, p. lxxv., and *hercules*, p. cxlvi., spp. nn., Fairmaire, C.R. ent. Belg. xxviii., E. Africa.

Cnodalinides.

Camaria gloriosa, sp. n., Fairmaire, S. E. Z. xlv. p. 135, Madagascar.

Helopides.

Helops alpigradus, Fairmaire, noticed by him ; Bull. Soc. Ent. Fr. (6) iv. p. iv.

Arthropus brouni, Sharp, figured by Waterhouse, Aid. iii. pl. cxlv. fig. 3.

Phæostolus, g. n., Fairmaire, C.R. ent. Belg. xxviii. p. cxlvi. Allied to *Hedyphanes*. Type, *P. grandicornis*, sp. n., t. c. p. cxlvii., E. Africa.

Perimylops, g. n., Müller, Deutsche E. Z. xxviii. p. 419. Probably allied to the *Helopidæ*. Type, *P. antrarcticus* [sic], sp. n., *ibid.*, S. Georgia.

Icanthopus reitteri, sp. n., Brenske, Deutsche E. Z. xxviii. p. 88, N. Morea.

Helops (Entomogonus) davidis, Fairmaire, Ann. Soc. Ent. Fr. (6) iv. p. 171, Akbès ; *H. (Catomus) testaceipes*, *id.* C.R. ent. Belg. xxviii. p. lxxvii., Algeria : spp. nn.

Nephodes gracilior, sp. n., *id. ibid.*, Algeria.

Helopinides.

Micrantereus variolosus, Gerstaecker. Supposed ♂ described by him ; JB. Hamb. Anst. i. p. 56.

Micrantereus seriepunctatus, p. lxxv., *externecostatus*, *marginipennis*, and *quadricristatus*, p. lxxvi., Fairmaire, C.R. ent. Belg. xxviii., E. Africa ; *M. lacrymosus*, Gerstaecker, JB. Hamb. Anst. i. p. 56, Massai : spp. nn.

Megacanthides.

Gonocnemis carbonaria, sp. n., Gerstaecker, JB. Hamb. Anst. i. p. 56, Massai.

Hoplonga impuncticollis, sp. n., Fairmaire, C.R. ent. Belg. xxviii. p. cxxiv., E. Africa.

Strongyliides.

Agissopterus, g. n., Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 513. Allied to *Strongylium*. Type, *A. semipunctatus*, sp. n., *ibid.*, Cordova.

Praogena viridicuprea and *sanguinipennis*, spp. nn., Gerstaecker, JB. Hamb. Anst. i. p. 57, Massai.

Nesogena lucidicollis, sp. n., Fairmaire, S. E. Z. xlv. p. 136, Madagascar.

CISTELIDÆ.

Plesia, Klug. Validity of the genus discussed; Dohrn, S. E. Z. xlv. pp. 42 & 43.

Mycetochares. Revision of European species (15 admitted, 4 new); Reitter, Deutsche E. Z. xxviii. pp. 241-250. *M. linearis*, Ill.: the larva figured by Heeger as belonging to this species does not belong to the genus; Bergroth, B. E. Z. xxviii. pp. 228 & 229, note.

New species :—

Allecula foveipennis and *clibricollis*, Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 514, Monte Video.

Pseudocistela (*Gonodera*) *bicolor*, Reitter, Deutsche E. Z. xxviii. p. 89, Greece.

Gonodera macrophthalma, id. t. c. p. 89, note, Central Caucasus; *G. corinthia*, Fairmaire, op. cit. iv. p. 172, Akbès.

Hymenalia castaneipennis, id. *ibid.*, Akbès.

Isomira antennalis, Reitter, Verh. Ver. Brünn, xxii. p. 9, Lirík.

Mycetochares flavicornis, Miller, Verh. z.-b. Wien, xxxiii. p. 265, Parnassus; *M. (Ernocharis) ocularis*, p. 245, *M. (E.) excelsa*, Lirík, p. 246; *M. (E.) laticornis*, Lebanon, and *M. (E.) auricoma*, Crimea, Sarepta, p. 249, Reitter, Deutsche E. Z. xxviii.

Ctenopus koltzei, Von Heyden, Deutsche E. Z. xxviii. p. 295, Askold.

Omophlus terminatus, Fairmaire, t. c. p. 171, Akbès.

MELANDRYIDÆ.

Conopalpus testaceus, Oliv., var. *flavicollis*, Gyll. (= *thoracicus*, Baudi), and *C. brevicollis*, Kraatz, discussed; Reitter, Deutsche E. Z. xxviii. pp. 91 & 92.

Pseudorchesia, g. n., Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 515. Allied to *Orchesia*. Type, *P. nigrosignata*, sp. n., *ibid.*, Missiones.

Lederia ehlersi, sp. n., Von Heyden, Deutsche E. Z. xxviii. p. 360, Sierra d'España.

LAGRIIDÆ.

Lagria rufescens, Boisd., injurious to fruit at Ryde, Australia; Whittell, P. Linn. Soc. N. S. W. ix. p. 180.

Aryenis rufescens, Bates, = *Statira unicolor*, Blanch.; Berg, An. Soc. Arg. xvi. p. 269.

Mylops, g. n., Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 499. *Lagriides*; but with a superficial resemblance to *Helops*. Type, *M. magellanicus*, sp. n., t. c. p. 500, Punta Arena. Müller, Deutsche E. Z. p. 418, refers this genus to the *Helopidae*, and describes *M. sparsulum*, sp. n., from South Georgia.

Lagria nitidiventris, sp. n., Fairmaire, S. E. Z. xlv. p. 137, Madagascar.

PEDILIDÆ.

Xylophilus densus, sp. n., Casey, Col. N. Am. p. 187, Philadelphia.
Euglenes (Olotelus) atomus, sp. n., Costa, Rend. Acc. Nap. xxiii. p. 167, Sardinia.

ANTHICIDÆ.

HORN, G. H. Synopsis of the United States species of *Notoxus* and *Mecynotarsus*. Tr. Am. Ent. Soc. xi. pp. 165-176.

The species are tabulated and described. The following synonymy occurs:—*Notoxus bicolor*, Say (= *murinipennis*, Lec.), *talpa*, Laf. (= *elegantulus*, Laf., and *subtilis*, Lec.), *apicalis*, Lec. (= *marginatus*, Lec.), *monodon*, Fabr. (= *pilatei* and *testaceus*, Laf.), *serratus*, Lec. (= *digitatus*, Lec.), and *conformis*, Lec. (= *sparsus*, Lec.).

Neogonus and *Tomoderus*. Table of species; Reitter, Deutsche E. Z. xxviii. pp. 91 & 258.

Anthicus blandulus, Baudi, may be a good species; Reitter, Wien. ent. Z. iii. p. 144. *A. californicus*, Laf., occurs in Delaware and New Jersey; the type was probably from Texas, not California: Casey, Bull. Brooklyn Soc. vii. p. 66.

New species:—

Formicomus serdangus, Marseul, Notes Leyd. Mus. vi. p. 163, Sumatra.

Neogonus emgei, Reitter, Deutsche E. Z. xxviii. p. 90, N. Morea.

Tomoderus (?) *funebriis*, id. t. c. p. 257, Spalato.

Notoxus delicatus, Casey, Col. N. Am. p. 189, New Jersey; *N. nuperus*, Arizona, New Mexico, Kansas, p. 168, *calcaratus*, Nevada, Arizona, Texas, Lower California, p. 170, and *denudatus*, California, p. 173, Horn, Tr. Am. Ent. Soc. xi.

Anthicus facilis, Casey, t. c. p. 190, Pennsylvania; *A. hirtisetosus*, Marseul, t. c. p. 164, Sumatra.

PYROCHROIDÆ.

Pyrochroa (?) *infumata* and *P.* (?) *elegans*. Hentz's descriptions reprinted; Bull. Brooklyn Soc. vi. p. 112.

MORDELLIDÆ.

Mordella deserta, sp. n., Casey, Col. N. Am. p. 186, Arizona.

RHIPIDOPHORIDÆ.

Rhipiphorus pectinatus or *limbatus*, Fabr., hyperparasitic on a *Tiphia*, which is parasitic on *Lachnosterna fusca*, Frühl.; Luggler, * Sci. Rec. ii. p. 232 (cf. Psyche, iv. p. 211).

Metæcus paradoxus, Linn. Notes on life history; Bargagli, Bull. Ent. Ital. xvi. pp. 94 & 95 (cf. also Everts, Tijdschr. Ent. xxvii. pp. lxxxviii.-cxi.).

Scotoscopus, g. n., Reitter, Deutsche E. Z. xxviii. p. 92. Allied to *Pelecotoma*; but palpi differently formed, and hind tibiæ spurred. Type, *S. carbonaria*, sp. n., *ibid.* pl. ii. figs. 20 & 20a, Parnassus.

CANTHARIDÆ.

BEAUREGARD, H. Structure de l'appareil digestif des Insectes de la tribu des Vésicantes. C.R. xcix. pp. 1083-1086.

12 species were examined. The main features of the digestive apparatus are similar to those of other insects.

PREUDHOMME DE BORRE, A. Les Meloides de l'Europe Central, d'après Redtenbacher et Guttfleisch. Bull. Soc. L. Brux. 1884 (sep. cop.) pp. 14.

SAUNDERS, S. S. On the *Pediculus melittæ* of Kirby, and its affinities, with reference to the larvæ of *Meloe*. Tr. E. Soc. 1884, pp. 107-119.

The peculiarities and habits of the yellow larvæ of *Meloe*, and the similar, but unidentified *P. melittæ*, are discussed; the author inclines to the opinion that the latter, differing by their larger size and black colour, are larvæ of the previous season, which have been prevented by unfavourable circumstances from effecting their first metamorphosis, but which have obtained sufficient nourishment to survive until another season.

New parasitic Coleopterous larva on bees; Beauregard, Lichtenstein, & Perez, Bull. Soc. Ent. Fr. (6) iv. pp. xxviii. & xliii.

Remarks on Cantharides; Mozziconacci, Bull. Insect Agric. ix. pp. 153-157.

Cerocomia schreberi, Fabr., and *Stenoria apicalis*, Latr., are parasitic upon various species of *Colletes*, and undergo hypermetamorphosis; Beauregard, C.R. xcix. pp. 148-151.

Mylabris tristigma, Gerstaecker. Variety noticed by him; J.B. Hamb. Aust. i. p. 57.

Cantharis. Seat of vesicating property; Beauregard, Bull. Soc. Ent. Fr. (6) iii. p. c. Contains chlorophyll; Tichomirow, * Pharm. Z. f. Russl. 1884, Nos. 40 & 41 (*cf.* Ent. Nachr. x. pp. 374 & 375).

Epicauta verticalis, Illig. First form of larva described; Beauregard, C.R. xcix. pp. 611-613.

Cephaloon variabilis, Motsch. Structure, variation, &c., discussed; Von Heyden, Deutsche E. Z. xxviii. pp. 279 & 281.

Sitaris muralis, Forst. Various stages noticed and figured; Riley, Am. Ent. xviii. p. 103. Eggs; Fallou, Bull. Soc. Ent. Fr. (6) iii. p. cxxxvi. Parasitic on *Anthophora parietina*, Fabr.; Fokker & Everts, Tijdschr. Ent. xxvii. pp. lxxxvii.-lxxxix.

Nemognatha nemorensis, Hentz. Description reprinted; Bull. Brooklyn Soc. vi. p. 112.

New species :—

Meloe crispatus, Fairmaire, Ann. Soc. Ent. Fr. (6) iv. p. 173, Akbès,

Pseudomeloe magellanicus and *venosulus*, Fairmaire, *op. cit.* iii. pp. 496 & 497, Patagonia.

Mylabris lictor, Gerstaecker, JB. Hamb. Anst. i. p. 57, N'Guruman.

Epicauta dichrocera, *id. t. c.* p. 58, N'Guruman.

Cantharis validicornis, Fairmaire, C.R. ent. Belg. xxviii. p. cxxiv., E. Africa.

Zonitis rufofasciata, Dobrudscha, and *funeraria*, Varna, *id.* Bull. Soc. Ent. Fr. (6) iii. p. cxlii.; *Z. seminigra*, Reitter, Deutsche E. Z. xxviii. p. 93, Sparta (differentiated from *Z. fulvipennis*, Fabr.); *Z. anatolica*, Frivaldszky, Term. füzetek, viii. p. 1, Broussa.

Situris rufiventris, Kraatz, Deutsche E. Z. xxviii. p. 175, Athens.

CEDEMERIDÆ.

Dryops femorata, Fabr. Occurrence in the Jura noticed; Riggenbach-Stehlin, MT. schw. ent. Ges. vii. p. 48.

Ananca frontalis, sp. n., Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 516, Mendoza.

Cedemera amurensis, sp. n., Von Heyden, Deutsche E. Z. xxviii. p. 295, Amur.

CURCULIONIDÆ.

BARGAGLI, P. Rassegna biologica di Rincofori Europei (continuazione). Bull. Ent. Ital. xv. pp. 301-326; xvi. pp. 3-52 & 149-258.

Extends to *Rinomaceridi*. The notes on transformations, habits, localities, &c., are frequently of great importance, but cannot here be quoted in detail.

BEDEL, L. Faune des Coléoptères du bassin de la Seine et de ses bassins secondaires; ii. pp. 65-144. Ann. Soc. Ent. Fr. (6) iii. & iv. (sep. pagination).

Includes the continuation of the tables of tribes of *Curculionidæ*; and the genera *Sitona* to *Mecinus*, inclusive.

— Recueil d'Observations Éthologiques faites sur les *Miarus*, et les *Mecinus* ou *Gymnetron*. *Op. cit.* iv. pp. 217-221.

Notices of the plants on which the various species and their larvæ are found, with authorities.

FAUST, J. Drei vergessene Rüsselkäfer. Rev. mens. Ent. i. pp. 135-139.

Contains remarks on some of the earlier works of Motschulsky, and his descriptions of *Erirhinus indistinctus* (= *Notaris acridulus*, L., var.), *Phytonomus ai-merthali* (? = *P. fasciculatus*, Herbst), and *Peritelus puncticollis* (= *Strophosomus obesus*, Markh.), are reprinted from CB. Ver. Riga, 1845, with comments.

Notes on weevils; Helen Watney, Gard. Chron. (2) xxii. pp. 235 & 236.

Note on the food-habits of some North American *Rhyncophora*; Schwarz, Bull. Brooklyn Soc. vii. pp. 84 & 85.

Apion pomonæ, Fabr. ♂ pairing with *Polydrusus undatus*, Fabr., ♀; Jenner, Ent. M. M. xxi. p. 36.

Anomophthalmus, g. n., Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 498. A Curculionid of doubtful affinities. Type, *A. insolitus*, sp. n., *ibid.*, Santa Cruz, Patagonia.

Microcerides.

Microcerus dorsofumatus, sp. n., Fairmaire, C.R. ent. Belg. xxviii. p. cxlvii., E. Africa.

Brachyderides.

STIERLIN, —. Bestimmungs-Tabellen europäischer Rüsselkäfer. II.

Brachyderideæ. MT. schw. ent. Ges. vii. pp. 57–98. Errata et addenda, pp. 698 & 699.

Includes descriptions of several new species. The occasional remarks on known species are unimportant; but the following varieties are noticed:—*Metallites elegantulus*, Boh., var. *signatus* and *modestus* (p. 64); *Polydrusus tereticollis*, Guér., var. *uniformis* (p. 77), and *Sciaphilus cæsius*, Hampe, var. *merklii* (p. 86).

Dactylopus popoffi, Mannerh., redescribed; Chevrolat, Bull. Soc. Ent. Fr. (6) iii. p. ciii.

Sitones griseus, Fabr., destructive to lupine; Karsch, Ent. Nachr. x. pp. 157–159.

Ischnotrachelus, Schönh. List of known and descriptions of new species; Chevrolat, B. E. Z. xxviii. pp. 183–185.

Polydrusus corruscus, Germ., and *ligurinus*, Gyll., differentiated; Faust, S. E. Z. xlv. p. 192.

Polycelæis bohemani, Boh., redescribed as *P. difficilis*; Dohrn, S. E. Z. xlv. pp. 180 & 184.

Chlorophanus graminicola, Schönh., variable in structure of thorax and elytra; Stierlin, t. c. pp. 7 & 8.

Aramigus fulleri, Horn, noticed by him; Canad. Ent. xvi. p. 216.

New genera and species:—

Leucodrusus, Stierlin, MT. schw. ent. Ges. vii. p. 60. Subgenus of *Polydrusus*. Allied to *Homapterus*, Fairm.; wings present, body thickly clothed with scales. To include *P. oberthueri*, Desbr., *sicanus* and *asterianus*, Chev., *tibialis*, Gyll. (and var. *robustus*, Desbr.), *chaerodrysius*, Gredl., and *L. fulvus*, sp. n., t. c. p. 65, Caucasus.

Tylodrusus, *id.* t. c. p. 61. Subgenus of *Polydrusus*; antennæ inserted close to the eyes; head generally with a prominence behind the eyes. To include *P. pterygomalis*, Boh., *caucasicus*, Desbr., *corruscus*, Germ. and *viridicinctus*, Gyll.

Holonychus inæquicollis, Fairmaire, S. E. Z. xlv. p. 137, Madagascar.

Blosyrodes crucirostris, Chevrolat, Bull. Soc. Ent. Fr. (6) iii. p. ciii., Borneo.

Charodrys reitteri, p. 61, *pictus*, Morea, and *minutus* (Tourn., MS.), Tangiers, p. 62, Stierlin, MT. schw. Ent. Ges. vii.

- Piezocnemus hopffgarteni*, Stierlin, *t. c.* p. 65, Grisons, Styria.
Eudipnus karamani, *id. t. c.* p. 67, Dalmatia.
Eustolus baldensis, Mount Baldo, p. 69, *ibericus*, Spain, p. 70, *piligerus* (Kratz, MS.), Samarcand, *bedeli*, Algiers, p. 71, *alpinus*, Macugnaga, *capricola*, Capri, *rubi*, Turkey, p. 75, and *mixtus* (Bris., MS.), Portugal, p. 76, *id. t. c.*
Polydrosus obliquatus, Faust, S. E. Z. xlv. p. 456, Tekke, Taschkend ; *P. dalmatinus*, Stierlin, *t. c.* p. 77, Dalmatia.
Conocetus longus (Desbr., MS.), Tangiers, p. 80, *græcus*, Greece, and *desbrochersi*, Carthage, p. 81, *id. t. c.*
Sciaphilus elegans (Desbr., MS.), Greece, p. 85, *reitteri*, Bosnia, p. 86, and *dalmatinus*, Dalmatia, p. 87, *id. t. c.*
Mitophorus gravidus and *semiceneus*, Gerstaecker, JB. Hamb. Anst. i. p. 58, Massai.
Ischnotrachelus aspericollis, Gaboon, p. 183, *dorsalis*, Old Calabar, *marginipennis*, W. Africa, *scutellaris*, p. 184, *trilineatus*, *calochloris*, Gaboon, *longicollis*, Old Calabar, and *immundus*, Guinea, p. 185, Chevrolat, B. E. Z. xxviii.
Polycleis ocellatus and *ornatissimus*, Gerstaecker, *t. c.* p. 59, Massai.
Cratopus adpersus, Waterhouse, Rep. Zool. Coll. Alert, p. 576, Eagle Island, Amiraute Islands.
Euphatus azureus, Macleay, P. Linn. Soc. N. S. W. ix. p. 704, Macleay Coast, New Guinea.
Rhinascapha maclayi, *id. t. c.* p. 705, Macleay Coast.

Otiorrhynchides.

- Celeuthetes bicristatus*, Montr., noticed from New Guinea ; Macleay, P. Linn. Soc. N. S. W. ix. p. 715.
Otiorrhynchus alpinus, Richt., *monticola*, Germ., and *maurus*, Gyll. (= *dubius*, Sturm.) : variation, &c., discussed ; Letzner, JB. schles. Ges. lxi. pp. 306 & 307. *O. dubius*, Sturm., and *lepidopterus*, Fabr., = *nodosus*, O. Fabr., and *salicis*, Ström, respectively ; Bergroth, B. E. Z. xxviii. p. 227. *O. hypocrita*, Rosenh., var. *delicatulus*, noticed ; Stierlin, MT. schw. ent. Ges. vi. p. 698. *O. ligneus*, Oliv. (destructive to strawberry): transformations described and figured ; Weed, Cook's Pract. Ent. pp. 6-10, figs. 7-9. *O. procerus*, Stierl., recorded as new to Germany ; Schultze, Deutsche E. Z. xxviii. p. 425.
Peritelus griseus, Oliv. Ravages noticed ; Girard, Bull. Soc. Ent. Fr. (6) iv. p. lxi. (cf. also Bull. Ent. Ital. xvi. pp. 144 & 145).
Barypeithes globus, Seidl., var. *sphaeroides* from Austria and Illyria described ; Stierlin, *op. cit.* vii. p. 92.
Parascytopus. Table of European species ; Reitter, Deutsche E. Z. xxviii. p. 96.

New species :—

- Otiorrhynchus subflum*, Taygetus, *O. (Arammichnus) expansus*, N. Morea, p. 94, and *O. (Tournieria) brenskii*, Greece, p. 95, Reitter, Deutsche E. Z. xxviii. ; *O. strumosus*, Heller, Wien. ent. Z. iii. p. 146, Montenegro ; *O. nitidiventris*, Fairmaire, Le Nat. vi. p. 446, Casablanca ; *O. ludyi*,

Bosnia, p. 37, *terrifer*, *quadratopunctatus*, Caucasus, *O. (Arammichnus) pipitzi*, Erzeroum, p. 39, *O. (A.) brisouti*, Algeria, and *O. (Tournieria) subsquamulatus*, Caucasus, p. 40, Stierlin, MT. schw. ent. Ges. vii.; *O. (T.) griseus*, Greece, and *O. parvulus*, Turkey, *id. t. c. vi.* p. 699.

Systates angulithorax and *fuscoeneus*, p. lxxvi., *crenatipennis* and *setosipennis*, p. cxlvii., *prolixus* and *albidovittatus*, p. ccxlvii., Fairmaire, C.R. ent. Belg. xxviii., E. Africa; *S. metallicus*, Gerstaecker, JB. Hamb. Anst. i. p. 58, Massai.

Peribrotus variolosus, *id. ibid.*, Massai.

Nastus devians, Faust, S. E. Z. xlv. p. 449, Armenia.

Mylacus reitteri, Syria, and *græcus*, Morea, Stierlin, *t. c.* pp. 36 & 37.

Peritelus sardous, Costa, Rend. Acc. Nap. xxiii. p. 168, Sardinia.

Barypeithes validus (Plas., MS.), Silesia, and *pirazzolii*, Imola, Stierlin, *t. c.* pp. 93 & 94.

Cuthormiocerus tenuiscapus, Fairmaire, *t. c.* p. cxxi., Morocco.

Platytarsus frivaldszkyi, Reitter, *t. c.* p. 259, Mehadia.

Phyllobius reitteri, Caucasus, *russicus*, Lenkoran, p. 41, *croaticus*, Croatia, and *heydeni*, locality not stated, p. 42, Stierlin, *t. c.*; *P. vesper-tilio*, Faust, *t. c.* p. 449, Armenia; *P. (Parascytopus) taygetanus*, Reitter, *t. c.* p. 96, Taygetus; *P. (Pseudomylocerus, Desbr.) albidus*, Miller, Verh. z.-b. Wien, xxxiii. p. 265, Parnassus.

Bastactes plurituberculatus, Dohrn, S. E. Z. xlv. p. 43, Brazil.

Brachycerides.

Brachycerus barbarus, Linn., noticed; Lucas, Bull. Soc. Ent. Fr. (6) iv. p. lvi.

Rhyparosomides.

Orthochaetes setulosus, Gyll., *erinaceus*, Duval, and *discoidalis*, Fairm., are varieties of *setiger*, Beck, but *insignis*, Aubé, is distinct; Bedel, Bull. Soc. Ent. Fr. (6) iv. pp. liv. & lv.

Cylindrorrhinides.

Otidoderes, Lac., = *Cylindrorrhinus*, Guér., and *O. cancellatus*, *externevittatus*, and *echinosoma*, Fairm., = *C. melanoleucus*, *lactifer*, and *horridus*, Burm., respectively; but *O. chilensis* and *C. lineatus*, Blanch., must be referred to *Adoristus*, Westw.: Berg, Bull. Soc. Ent. Fr. (6) iii. pp. xeviii. & xcix.

Adoristus aspericollis, sp. n., Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 502, Patagonia.

Otideres cancellatus, p. 500, *externevittatus*, and *echinosoma*, p. 501, spp. nn., *id. t. c.*, Patagonia.

Listroderes nigrinus, sp. n., *id. t. c.* p. 503, Punta Arena.

Lithinides.

Lithinus compressituber and *rufopenicillus*, spp. nn., Fairmaire, S. E. Z. xlv. p. 138, Madagascar.

Molytides.

Molytes germanus, Linn., noticed; Gadeau de Kerville, * Mél. Ent. i. p. 40.

Liparus (Molytes) coronatus, Goeze. Larva described; Mayet, Bedel, Faune Col. Seine, ii. pp. 96-98.

Liosoma, Steph. Synopsis; 21 species, 2 new; *Leiosomus stierlini*, Tourn., probably does not belong to this genus; *id.* Rev. d'Ent. iii. pp. 132-141.

Meleus. Revision of the Caucasian species, with descriptions of 8 new; Reitter, Deutsche E. Z. xxviii. pp. 9-15. Caucasian species described, including *M. silphoides*, Herbst, *caucasicus*, Desbr., *fallax*, Fald., *schneideri*, Tourn., and 5 new species; Faust, S. E. Z. xlv. pp. 217-224.

Neoplinthus, g. n., Bedel, Faune Col. Seine, ii. p. 91. Allied to *Plinthus*; femora dentated; metathoracic episterna free; size rather large. Type, *P. tigratus*, Rossi.

Liosoma reitteri, Caucasus, and *baudii*, Vallombrosa and Como, spp. nn., Bedel, Rev. d'Ent. iii. pp. 138 & 139.

Meleus faldermanni, p. 218, *difficilis*, *chaudoiri*, p. 220, *dolosus* and *incertus*, p. 222, Faust, S. E. Z. xlv.; *M. grusinus*, *irroratus*, p. 13, *vitatus*, *fausti*, *granulosus*, *swaneticus*, p. 14, *mingrelicus* and *depressicollis*, p. 15, Reitter, Deutsche E. Z. xxviii., Caucasus: spp. nn.

Adexius corcyreus, sp. n., *id. t. c.* p. 120, Corfu.

Scythropides.

Scythropus pineti, *oxycedri*, and *pheniceus*, spp. nn., Fairmaire, C.R. ent. Belg. xxviii. p. lxviii., Algeria.

Hyperides.

Phytonomus punctatus, Fabr.: habits, &c., noticed; it was probably introduced from Europe; destructive to clover in Canada: Kilman & W. Saunders, Canada Ent. xvi. pp. 144, 145, 209, & 210. Another species noticed; Fletcher, *op. cit.* p. 215. *P. opimus*, Horn: abundance, and ravages on clover in America; Reinecke, * Buffalo Freie Presse, Aug. 12, 1884, and Bull. Buff. Soc. vii. p. 76.

Alophus kaufmanni, Stierlin, MT. schw. ent. Ges. vii. p. 43, Hungary; *A. quadripunctatus*, Kraatz (? = *subcostatus*, Ball., var.), Deutsche E. Z. xxviii. p. 225, Osch.: spp. nn.

Hypera pustulata, sp. n., Frivaldszky, Term. füzetek, viii. p. 283, Hungary.

Cleonides.

Temnorhinus hispanus, Martorell, = *conicirostris*, Oliv., var.: Chevrolat, Bull. Soc. Ent. Fr. (6) iv. p. lxviii.

Xanthochelus eversmanni, Fähr. (probably distinct from *firmus*, Schönh.), discussed; Dohrn, S. E. Z. xlv. p. 461.

New species :—

Stephanocleonus favens, Faust, S. E. Z. xlv. p. 464, Mongolia (table of allied species added) ; *S. obliquivittis*, Chevrolat, Bull. Soc. Ent. Fr. (6) iv. p. lxxviii., Austria (?) (*Bothynoderes foveicollis*, Gebl., *fatuus* and *stigmaticollis*, Gyll., are said also to belong to this genus ; but at p. lxxv. *S. obliquivittis* is itself referred to *Bothynoderes*).

Neocleonus virgo, id. t. c. p. lxxix., Abyssinia.

Bothynoderes armeniacus, Faust, t. c. p. 451, Armenia.

Corigelus weisei, id. t. c. p. 457, Tekke.

Chromonotus menetriesi, id. t. c. p. 458, Tekke.

Cleonus riffsensis, Fairmaire, Le Nat. vi. p. 446, Casablanca.

Porocleonus|| *superciliosus*, Chevrolat, t. c. p. lxxviii., Siberia. (Renamed *P. fatalis* at p. lxxv.)

Isomerus aschabadensis, Aschabad, and *brahminus*, Bangalor, Faust, t. c. pp. 459 & 460, note.

Lixus posticus, Albasin, Chabarofka, p. 466, *obliquus*, Dauria, p. 467, and *salsolæ*, Sarepta, Astrachan, Turkestan, Caucasus, p. 468, id. t. c. ; *L. barbiger*, Dohrn, S. E. Z. xlv. p. 278, Madagascar.

Hylobiides.

Hylobius pales and *Pissodes strobi*, Peck, noticed as injurious to white pine in North America, and the latter figured ; W. Saunders, Rep. E. Soc. Ont. 1883, p. 55, fig. 23, and Rep. Fruit-Growers' Ass. Ont. 1883, p. 325, fig. 23.

Hylobius alpheus, Reiche, var. *fulvopictus*, from Taygetus, described ; Reitter, Deutsche E. Z. xxviii. p. 96.

Curculio transversovittatus, Goeze. Larva described ; Mayet, Bedel, Faune Col. Seine, ii. pp. 93-95.

Erirrhinides.

Dorytomus. Bedel, Bull. Soc. Ent. Fr. (6) iv. pp. c. & ci., discusses the synonymy of the European species, and gives the following list : *D. tortrix*, Linn. (= *pectoralis*, Panz.), *hirtipennis*, Bedel (= *flavipes*, Boh., *teniatus*, Thoms., and ? *ictor*, Herbst), *teniatus*, Fabr. (= *maculatus*, Marsh., *bituberculatus*, Zett., and *silbermanni*, Wenck.), *flavipes*, Panz. (= *suratus*, Gyll.), *melanophthalmus*, Payk. (= *punctator*, Herbst, and *pectoralis*, Thoms), and *rufulus*, Bedel (= *pectoralis*, Faust, ? *fructuum*, Marsh., and ? *arcuatus*, Panz.).

Curculio dorsalis, Linn., is not a *Dorytomus*, but a *Gymnetron* ; *D. dorsalis*, Payk., nec Linn., is renamed *sanguinolentus* : id. t. c. p. lv.

Mecinus collaris, Germ., bred from galls on *Plantago maritima* ; Aurivillius, Ent. Tidskr. v. pp. 53 & 91. *Micromelus* ^{*pyrrhogaster*}, Walk., appears to be parasitic upon it ; Bignell, Ent. xvii. p. 46.

Bagous aubei, Cussac, = *petro*, Herbst ; *subcarinatus*, Gyll., = *frit*, Herbst ; *frit*, Bris., = *claudicans*, Boh. ; and *B. lutulentus*, Gyll., = *glabrirostris*, Herbst : Bedel, Bull. Soc. Ent. Fr. (6) iv. p. liv. *B. binodulus*, Herbst : larva described ; De Kerville, Bull. Soc. Ent. Fr. (6) iv. pp. lxxxii. & lxxxiii.

Tanyssphyrus lemnae, Fabr., noticed; Hamilton, Canad. Ent. xvi. p. 136.

Smicronyx cicur, Gyll. (?) Transformations described and figured; Mik, Wien. ent. Z. iii. pp. 67-71, pl. i. figs. 6-14.

Palæchthus, g. n., Waterhouse, Ann. N. H. (5) xiii. p. 277. Allied to *Erirhinus*, but third joint of tarsi scarcely broader than the preceding. Types, *P. glabratus* and *cossonoides*, spp. nn., t. c. p. 278, Nightingale Island.

Echinocnemus sieversi, sp. n., Faust, S. E. Z. xlv. p. 452, Tiflis.

Bagous kirschi, sp. n., Reitter, Deutsche E. Z. xxviii. p. 121, Zante.

Cylades.

Cylas curtipennis, Fairmaire, C.R. ent. Belg. xxviii. p. cxlvii., Zanzibar.

Apionides.

SMITH, J. B. Synopsis of the *Apionine* of North America. Tr. Am. Ent. Soc. xi. pp. 41-68, pl. iii.

A large number of new species are described. The figures chiefly represent group-details. The following synonyms occur:—*Apion cribricolle*, Lec. (= *porosicolle*, Germ.), *segnipes*, Say (= *cinereum*, Gerst.), and *troglodytes*, Mann. (= *metallicum*, Gerst.).

Apion geniste, Kirb., and *fuscirostre*, Fabr.: life-histories; Buddeberg, J.B. nass. Ver. xxxvii. pp. 84-87. *A. frumentarium*, Linn., forming galls on *Rumex acetosella*; Von Schlechtendal, Z. Naturw. lvii. p. 492. *A. obsoletum*, Smith: varying structure, &c., of scape noticed; Casey, Bull. Brooklyn Soc. vii. p. 67.

Apion squamosum, Faust, S. E. Z. xlv. p. 455, Derbent, Armenia; *A. arragonicum*, Everts, Wien. ent. Z. iii. p. 219, Arragon; *A. erraticum*, Texas, Iowa, *obsoletum*, Dacota, Michigan, Canada, *erythrocerum*, Kansas, &c., p. 44, *robustum*, Texas, Missouri, Iowa, p. 45, *punctinatum*, Wyoming, Colorado, &c., p. 46, *parallelum*, Tennessee, *estriatum*, Canada, Colorado, Texas, *ovale*, Missouri, California, p. 47, *impunctistriatum*, Texas, *desolatum*, Georgia, *sordidum*, Washington Territory, p. 48, *floridanum*, Florida, California, Arizona, Iowa, *obesum*, Michigan, Texas, *parvulum*, Middle States, *atripes*, Georgia, Florida, California, p. 49, *minutum*, Florida, New York, *opacicolle*, California, Arizona, Oregon, p. 50, *texanum*, Texas, *ellipticum*, Nebraska, Louisiana, p. 51, *californicum*, California, *decoloratum*, Arizona, Virginia, &c., *concoloratum*, California, Michigan, Southern States, *carinatum*, Florida, Texas, Nebraska, p. 52, *brevicolle*, California, Texas, Arizona, *typicum*, California, *abdominale*, Arizona, Illinois, *antennatum*, California, Arizona, p. 53, *cordatum*, California, *capitatum*, Michigan, Nebraska, Oregon, *oblitum*, Southern and Western States, p. 54, *turbulentum*, Middle States, Texas, California, *minor*, California, Louisiana, p. 56, *dilatatum*, Arizona, *herculanum*, Northern States, p. 56, *pyriforme*, Arizona, p. 57, *vicinum*, United States, *modestum*, Arizona, Kansas, Florida, p. 58, *perminutum*, Massachusetts, Texas, &c., *griseum*, United States, p. 59, *fraternum*, *varicorne*, Southern and Western States, p. 60, *extensum*, Montana, Kansas, *aneipenne*, Dacota Territory, *contusum*, Dacota, p. 61, *tenuirostrum*, Texas, Kansas, &c.,

attenuatum, Kansas, p. 62, *confertum*, Western and Southern States, p. 63, and *patrulele*, United States, p. 64, Smith, *t. c.*; *A. vespertinum*, Casey, Bull. Brooklyn Soc. vii. p. 67, California: spp. nn.

Attelabides.

Attelabus curculionoides, Linn. Black variety noticed; Mina Palumbo, Nat. Sicil. iii. (Cenni Bibliografici, p. 28).

Attelabus christophi, sp. n., Faust, S. E. Z. xlv. p. 471, Amur.

Rhinomacerides.

° WASSMANN, E. Die Trichterwichter. Eine naturwissenschaftliche Studie über den Thierinstinkt. Mit einen Anhang über die neueste Biologie und Systematik der *Rhynchites*-Arten und ihrer Verwandten (*Attelabiden*, *Rhynchitiden*, und *Nemonygiden*). Munich: 1884, 8vo, pp. 266, pls. iii., and woodcuts. (Cf. Deutsche E. Z. xxviii. pp. 431 & 432, and Wien. ent. Z. iii. p. 287.)

Rhynchites alliarie, Payk., and a new species from the Amur, discussed; Faust, S. E. Z. xlv. pp. 189-192.

Rhynchites thomsoni, *id. t. c.* p. 191, Amur; *R. naso*, Casey, Col. N. Am. p. 190, California: spp. nn.

Magdalinides.

Magdalis. Short notes on various species; Czwalina, Deutsche E. Z. xxviii. p. 415.

Magdalis koltzei, Von Heyden, Deutsche E. Z. xxviii. p. 297, Amur; *M. russata*, Fairmaire, C.R. ent. Belg. xxviii. p. lxviii., Batua: spp. nn.

Balaninides.

Balaninus, Germ. Table of North American species; Blanchard, Bull. Brooklyn Soc. vii. pp. 106-108.

Balanobius nobilis, sp. n., Reitter, Deutsche E. Z. xxviii. p. 96, Attica.

Balaninus obtusus, sp. n., Blanchard, *t. c.* p. 107, United States.

Anthonomides.

Orchestes populi, Linn. Ravages in North Sweden; Spångberg, Ent. Tidskr. v. pp. 200 & 229.

Anthonomus inversus, Bedel (= *ulmi*, Desbr., nec De Geer, which latter = *pedicularius*, Linn.), Bedel, Faune Col. Seine, ii. p. 130, France; *A. biplagiatus*, Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 503, Punta Arena; *A. moleculus*, Casey, Col. N. Am. p. 191, Philadelphia: spp. nn.

Bradybutus carbonarius, sp. n., Reitter, Verh. Ver. Brünn, xxii. p. 9, Lirík, Leukoran.

Tychiides.

Elleschus bipunctatus, Linn. Habits and characters noticed; Hamilton, Canad. Ent. xvi. pp. 106 & 107.

Sibynia viscaria, Linn.: life-history; Buddeberg, JB. nass. Ver. xxvii. pp. 71 & 72. *S. zuberi*, Desbr., and *Tychius morawitzi*, Tourn., discussed; Faust, S. E. Z. xlv. pp. 469-471.

Elleschus californicus, sp. n., Casey, Col. N. Am. p. 193, California.

Tychius rufovittatus, Derbent, and *kirschii*, Kirghis Steppes, spp. nn., Faust, S. E. Z. xlv. pp. 455 & 471.

Sibynia massageta, sp. n., *id. t. c.* p. 463, Turkomania.

Miccotrogus alhagi, Krasnodovsk, and *festivus*, Astrachan, spp. nn., *id. t. c.* pp. 462 & 468.

Cionides.

Synopsis of French genera and species; Des Gozis, Feuill. Nat. xiv. pp. 122-125, 139-143, & 155-157.

Nanophyes lythri, Fabr. Life-history; Buddeberg, JB. nass. Ver. xxxvii. pp. 72-74.

Derelomides.

Stethelasma, g. n., Frivaldszky, Term. füzetek, viii. p. 2. Allied to *Derelomus*; club of antennæ distinctly jointed; sides of thorax not margined; and prosternum with a peculiarly-shaped process (figured). Type, *S. paradoxum*, sp. n., *t. c.* p. 3, Asia Minor.

Læmosaccides.

Lamosaccus nigrotuberosus, sp. n., Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 504, Punta Arena.

Cryptorrhynchides.

Conotrachelus nenuphar, Herbst, discussed, with special reference to the terms "weevil" and "Curculio"; Devereaux, Canad. Ent. xvi. pp. 27-29. Habits and ravages; W. Saunders, *t. c.* p. 208.

Psepholax tibialis and *coronatus*, Broun, are sexes; Hudson, N. Z. J. Sci. ii. p. 123.

Tyloderma fragariæ, Riley. Life-history, ravages, &c., discussed; Forbes, Rep. Ins. Illin. xii. pp. 64-75, figs. 8 & 9, and xiii. p. 142, pl. ix. fig. 6.

Crisius variegatus, Broun, figured; Waterhouse, Aid, iii. pl. cxlv. fig. 6.

Arthrostenus ignoratus, sp. n., Faust, S. E. Z. xlv. p. 453, Derbent.

Cumptorhinus humeralis, Andamans, and *quadrilineatus*, Philippines, spp. nn., Chevrolat, Bull. Soc. Ent. Fr. (6) iv. p. cii.

Tyloderma nigrum, Illinois, and *punctatum*, Long Island, spp. nn., Casey, Col. N. Am. pp. 56 & 57.

Cryptorrhynchus fraudulentus, sp. n., Chevrolat, *t. c.* p. cii., New Caledonia.

Zygopides.

Chirozetes aurensis, sp. n., Von Heyden, Deutsche E. Z. xxviii. p. 296, Askold.

Ceuthorrhynchides.

Life-histories of *Rhinoncus guttalis*, Grav., *bruchoides*, Herbst, *pericarpus*, Linn., *Ceuthorrhynchus orator*, Schönh., *geographicus*, Goeze, and *Tapinotus sellatus*, Fabr.; Buddeberg, JB. nass. Verr. xxxvii. pp. 74-84.

Ceutorrhynchus sulcicollis, Linn., discussed; Savard, Bull. Insect. Agric. ix. pp. 3-7.

Ceutorrhynchus trivialis, Derbent, and *volgensis*, Samara, spp. n., Faust, S. E. Z. xlv. pp. 456 & 471.

Hypurus veronicae, sp. n., Frivaldszky, Term. füzetek, viii. p. 284, Hungary.

Baridiides.

Baris crassipes, sp. n., Faust, S. E. Z. xlv. p. 462, Tekke.

Baridius soricinus, sp. n., Fairmaire, C.R. ent. Belg. xxviii. p. lxix., Biskra.

Calandrides.

Calandra granaria, Linn., noticed; Bull. Insect. Agric. ix. pp. 158 & 159.

Liocalandra (?) *pygialis*, sp. n., Fairmaire, C.R. ent. Belg. xxviii. p. cxlviii., E. Africa.

Cossonides.

Agrilochus prolixus, fig. 7, and *Canthorhynchus bellus*, figs. 8 & 9, Broun, figured by Waterhouse, Aid, iii. p. cxlv.

New genera and species:—

Aphyllura, Reitter, Deutsche E. Z. xxviii. p. 97. Allied to *Charorhinus*; but flagellum seven-jointed, and elytra long, with a leaf-like expansion at the tip on the outside. Type, *A. bremskei*, sp. n., *ibid.* pl. i. fig. 9, N. Morea.

Anchonidium (La Ferté, MS.), Bedel, Faune Col. Seine, ii. p. 92. Allied to *Aparopion*; second joint of funiculus one-half shorter than first, joints 3 to 7 transverse; eyes very small. Type, *Styphlus unguicularis*, Aubé.

Pentarthrum carmichaeli, Waterhouse, Ann. N. H. (5) xiii. p. 279, Inaccessible Island.

Amaurorrhinus constrictus, Reitter, Deutsche E. Z. xxviii. p. 98, Attica.

Aparopion æquale, *id.* Verh. Ver. Brünn, xxii. p. 9, Lenkoran.

Rhyncolus hopffgarteni, Stierlin, MT. schw. ent. Ges. vii. p. 56, Hungary.

SCOLYTIDÆ.

* WACHTEL, F. A. Die doppelzähliger europäischen Borkenkäfer (*Tomicidæ*). Wien: 1884, 4to, pp. 14, pls. iii. [From MT. forstl. Versuchswesen Österr. (3) iii.] [Cf. Wien. ent. Z. iii. p. 127.]

Dendroctonus sp., *Hylesinus opaculus*, Lec., and other species destroying tamarac; bark-beetles will attack healthy trees: Harrington, Canad. Ent. xvi. p. 278.

Hylurgus terebrans, Oliv., and *Xyleborus xylographicus*, Say (fig. 22), noticed as injurious to white pine in America; W. Saunders, Rep. E. Soc. Ont. 1883, p. 55, and Rep. Fruit-Growers' Ass. Ont. 1883, p. 325.

Hylesinus fraxini, Fabr., and *Phlæophthorus spartii*, Nörtl. (= *tarsalis*, Först.). Life-histories; Buddeberg, JB. nass. Ver. xxxvii. pp. 87-93.

Hypothenemus eruditus, Westw., *Stephanoderes* (*Bostrichus*) *areccæ*, Homung, and *B. boieldieni*, Perr., are identical, but *B. ruficollis*, Fabr., is distinct; *S. ehlersi*, Eichh., is a true *Hypothenemus*, and Lindemann's genus *Homæocryphalus* consequently falls: Fauvel, Rev. d'Ent. iii. p. 315 (cf. also p. 390).

Tomicus, Latr., = *Ips*, De Geer (*nec* Fabr.), the type of which is *typographus*, Linn.; Bergroth, B. E. Z. xxviii. p. 230.

Scelytus rugulosus, Ratzeb. Larva noticed; Bargagli, MT. schw. ent. Ges. vi. p. 93. Destroys pear trees infested by *Chionaspis furfurus*, Fitch; Hagen, Canad. Ent. xvi. pp. 161-163.

Carphoborus bonnairei, sp. n., Brisout, Bull. Soc. Ent. Fr. (6) iv. p. lii., Algeria.

Tomicus heydeni, sp. n., Eichhoff, Deutsche E. Z. xxviii. p. 298, Amur.

BRENTHIDÆ.

DONCKIER DE DONCEEL, H. Liste des Brenthides décrits postérieurement au Catalogue de Gemminger et Von Harold. CR. ent. Belg. xxviii. pp. cccliii.-cccx.

Higonius poweri, Lewis, and *cruz*, Olliff, figured by Waterhouse, Aid, iii. pl. cxlv. figs. 1 & 2.

Miolispa suturalis, Pasc., var. from Aru noticed; Waterhouse, Ann. N. H. (5) xiii. p. 283.

Eupsalis minuta, Dru. Transformations briefly noticed and figured; W. Saunders, Rep. Fruct-Grower's Ass. Ont. 1882, p. 272, fig. 8.

Eutrachelus sumatrensis, Waterh., = *temmincki*, Gyll., *nec* Latr.; Ritsema, Notes Leyd. Mus. vi. p. 134.

Eupsalis bifalcatus, sp. n., Fairmaire, C.R. ent. Belg. xxviii. p. cxlvii., E. Africa.

ANTHOTRIBIDÆ. •

DONCKIER DE DONCEEL, H. Liste des Anthribides décrits postérieurement au Catalogue de Gemminger et Von Harold; C.R. ent. Belg. xxviii. pp. ccxxiv.-cccxxxiii.

Brachytarsus paululus, sp. n., Casey, Col. N. Am. p. 194, Delaware.

BRUCHIDÆ.

Caryoborus sp. bred from fruit of a palm allied to *Orbignya humilis*, Mart.; Lefèvre, Bull. Soc. Ent. Fr. (6) iv. pp. cxxvii. & cxxviii.

Mylabris melanocephala, Fabr., noticed; Reitter, Wien. ent. Z. iii. p. 84.

Bruchus cubiculus, sp. n., Casey, Col. N. Am. p. 183, Arizona.

Mylabris (Geoffr.) *semicarnea*, sp. n., Reitter, Deutsche E. Z. xxviii. p. 99, Attica.

CERAMBYCIDÆ.

BATES, H. W. *Biologia Centrali-Americana*. [Vide Godman & Salvin, *INSECTA: General Subject.*] *Col.* v. pp. 225-248, pl. xvi.

Includes Supplement to *Longicornia* as far as *Hypermallus*.

— Longicorn Beetles of Japan. Additions, chiefly from the later collections of G. Lewis, and notes on the synonymy, distribution, and habits of the previously known species. *J. L. S.* xviii. pp. 205-262, pls. i. & ii.

The original list in *Ann. N. H.* xii. [1873] comprised 107 species, and the present supplement 129, making a total of 236 Japanese Longicorns at present known. The proportion of tropical forms in the supplementary list is rather less than in the first. A large number of new genera and species are described.

GANGLBAUER, L. *Bestimmungs-Tabellen der europäischen Coleopteren*. VIII. *Cerambycidae* (Schluss). Mit Berücksichtigung der Formen Algiers und des paläarktischen Asiens, exclusive jener von Japan. *Verh. z.-b. Wien*, xxxiii. pp. 437-586. (Cf. Kolbe, *B. E. Z.* xxxviii. p. 394.)

Commences with the genus *Dorcadion*.

— Les Longicornes Gallo-Rhéniens. Tableaux traduits de l'allemand et abrégés des *Cerambycidae* de L. Ganglbauer, par A. Dubois, avec notes et catalogue supplémentaires. *Rev. d'Ent.* iii. pp. 163-239. (Catalogue, par A. Fauvel, *op. cit.* pp. 317-390.)

Lameere remarks on the close relationship between the *Longicornia* and the *Phytophaga*; *C.R. ent. Belg.* xxviii. pp. lxxxiii. & lxxxiv.

Correlation of the lists of European *Cerambycidae* in the second and third editions of Stein & Weise's Catalogue; *Ent. Nachr.* x. pp. 65-69.

List of 59 *Cerambycidae* in the Lisbon Museum, the following being specially noticed:—*Philagetes latus*, Thoms., *wahlbergi*, Fabr., *Monochamus griseoplagiatus*, Thoms., *Anoplostetha lactator*, Fabr. (= *radiatus*, Gory), *Sternotomis chrysopras*, Voet, *regalis*, Fabr., *Tragocephala delia*, Thoms., *pulchella*, Westw., *Ceraplesis bicincta*, Fabr.; Oliveira, *J. Sci. Lisb.* x. pp. 109-117.

Synopses of N. American Longicorns (*Ergates* to *Eucrossus*); Leng, *Bull. Brooklyn Soc.* vii. pp. 7-11, 57-64, 95-101, 112-116, pl. ii.

Prionides.

KOLBE, H. J. Zur Frage über die systematische Stellung von *Hypocephalus*, Desbr. *B. E. Z.* xxviii. pp. 399-402.

After discussing the affinities of this insect, the writer proposes to refer it to an aberrant group of *Prionide*, with *Parandra*, *Sypilus*, and *Mysteria*. Its structure and affinities are also discussed by Sharp & Lameere (*C.R. ent. Belg.* xxviii. pp. cvii.-cxii, ccl.-cclv., cclxv.-cclxxii, figs.). Lameere regards it as a Longicorn adapted to a subterranean life, and as having had a common origin with the subterranean *Cyrtognathinae*. (Cf. also Fairmaire, *Le Nat.* vi. pp. 397 & 398, fig.;

Fairmaire & Salicé, Bull. Soc. Ent. Fr. (6) iii. p. cxlvi. & iv. p. xi.; and Sharp, P. E. Soc. 1884, p. ii.)

LANSBERGE, J. W. VAN. Catalogue des Prionides de l'Archipel Indo-Néerlandais, avec descriptions des espèces nouvelles. Notes Leyd. Mus. vi. pp. 135—160.

42 species enumerated.

Bates, Biol. Centr. Am. Col. v. pp. 225—237, pl. xvi., notices *Parandra polita*, Say, *Psolidognathus modestus*, Fries (= *mygaloides* and *batesi*, Thoms., and *wallisi*, Tasch.), *Derobrachus longicornis*, Bates, *subcicornis*, Lec., figs. 5 & 6, *inaqualis*, Bates, *geminatus*, Lec., *apterus*, Bates, figs. 7 & 8, *Orthomegas cinnamomeus*, Linn. (= *Prionus corticinus*, Oliv.), *Callipogon barbatum*, Fabr., and *lemoinei*, Reiche, *Strongylaspis scobinatus*, Thoms., and var. *belti*, *Aplagiognathus hybostoma*, Bates (= *Prionus sub-sulcatus*, Dalm.), fig. 9, *Nothopleurus mandibularis*, Gemm. (= *dentiger* [Lec.], Crotch), *Mallodonopsis corrosus*, fig. 10, and *Mallaspis præcellens*, Bates.

Parandra janus, Bates, noticed from Java; Van Lansberge, Notes Leyd. Mus. vi. p. 135.

Prionus sp.: females attracted by males as well as males by females; Anna K. Dimmock, Psyche, iv. p. 159. *P. brevicornis*, Fabr., "assembling"; Clarkson, Canad. Ent. xvi. p. 95. *P. coriarius*, Linn.: habits; Fromont, C.R. ent. Belg. xxviii. pp. clxxiv.—clxxviii.: monstrosity described; Schneider, Z. E. Ver. schles. (2) ix. p. xx. *P. laticollis*, Dru.: transformations popularly described and figured; W. Saunders, Rep. Fruit-Grower's Ass. Ont. 1882, p. 269, figs. 1—3.

Acanthophorus hahni, Suffr., noticed from S.W. Africa; Dohrn, S. E. Z. xlv. p. 45.

Xixuthrus, Thoms., discussed, and ♂♂ of *X. microcerus*, White, and *luso*, Thoms., described; Van Lansberge, t. c. pp. 139—141.

Dysiatius melas, Pasc., ♀ described; id. t. c. p. 163.

Ergates faber, Linn., noticed; Bargagli, Bull. Ent. Ital. xvi. p. 95.

Prionobius, Muls., and *Macrotoma*, Serv. Characters discussed; Van Lansberge, t. c. p. 144.

Macrotoma. Waterhouse, Ann. N. H. (5) xiv. pp. 376—387, discusses this genus, and describes several new species; *M. hayesi*, Hope, is totally distinct from *serripes*, Fabr.; *M. absurda*, Newm., is redescribed, and several other species are incidentally noticed.

Omotagus lucordairei, Pasc., ♀ described; Van Lansberge, t. c. p. 155.

Orthosoma brunneum, Forst., noticed as injurious to white pine in America, and figured; W. Saunders, Rep. Fruit-Grower's Ass. Ont. 1883, p. 324, fig. 21, and Rep. E. Soc. Ont. 1883, p. 54, fig. 21.

Psephenactus hamiger, Har., ♂ described and figured; Bates, J. L. S. xviii. p. 207, pl. i. fig. 3.

New genera and species:—

Emphiesmenus, Van Lansberge, Notes Leyd. Mus. vi. p. 137. *Derobrachides*. Type, *M. schageni*, sp. n., t. c. p. 138, Sumatra.

Clinopleurus, Van Lansberge, *t. c.* p. 141. Allied to *Xixuthrus*; mesosternal process bilobed, mandibles shorter, palpi longer, &c. Type, *C. arfakianus*, sp. n., *t. c.* p. 142, New Guinea.

Ulogastra, *id. t. c.* p. 151. Allied to *Agrianome*; middle of abdomen shining in ♂, tarsi less robust, 1st joint shorter. Type, *U. colfisi*, sp. n., *t. c.* p. 152, Sumbawa.

Parandra lata, Bates, *Biol. Centr. Am. Col.* v. p. 226, pl. xvi. fig. 2, Mexico.

Ancylotropus javanus, Java, and *ferox*, Sumatra, Van Lansberge, *Notes Leyd. Mus.* vi. pp. 136 & 137.

Prionus flohri and *mexicanus*, Bates, *t. c.* p. 227, Mexico.

Derobrachus granulatus, *forreri*, and *megacles*, Mexico, p. 230, and *D. (?) cylindroides*, Guatemala, p. 231, *id. t. c.*

Xixuthrus lunicollis, Van Lansberge, *t. c.* p. 140, Amboina, Ceram, Key, Mysol.

Prinobius pascoei (= *Macrotoma luzonum*, Pasc.), Sumatra, Borneo, &c, p. 144, *celebensis*, Celebes, p. 145, *alfurus*, Timor, Flores, Amboina, p. 146, *vestitus*, Sumbawa, p. 147, and *ceramensis*, Ceram, p. 148, *id. t. c.*

Macrotoma signaticollis, Africa ??, p. 378, *elliotti*, p. 379, *inscripta*, p. 380, *plagiata*, India, p. 381, *fisheri*, Burmah, p. 382, *dejeani*, Java (♀ = *serricollis*, Thoms., ♀), Java, *cowani*, p. 384, *watersii*, Madagascar, p. 385, and *dimidiaticornis* (Dej., MS.), S. Africa, p. 386, Waterhouse, *Ann. N. H.* (5) xiv.

Strongylaspis championi, Guatemala, and *graniger*, Panama, Bates, *t. c.* p. 233.

Rhaphipodus blumei, Van Lansberge, *t. c.* p. 150, Java.

Xaurus papuus, *id. t. c.* p. 153, New Guinea.

Archetypus castaneus, Waterhouse, *P. Z. S.* 1884, p. 217, pl. xvi. fig. 4, Maroe.

Nothopleurus lobigenis, Bates, *t. c.* p. 235, Mexico.

Ægosoma giganteum and *fimbriatum*, Van Lansberge, *t. c.* pp. 156 & 157, Sumatra.

Megopsis costata, Java, Sumatra, and *cinnamomea*, Java, *id. t. c.* pp. 158 & 159.

Trichoderes rugosus, Bates, *t. c.* p. 236, Guatemala.

Mallaspis lampros, p. 236, *iris*, Guatemala, p. 237, *insignis*, Costa Rica, Panama, and *trichostetha*, Costa Rica, p. 238, *id. t. c.*

Holototus minor, *id. t. c.* p. 239, pl. xvi. figs. 13 & 14, Mexico.

Cerambycides.

KOLBE, H. J. Die Entwicklungsstadien der *Rhagium*-Arten und des *Rhamnusium salicis*, nebst einer vergleichend-systematischen Untersuchung der Larven und Imagines dieser Gattungen und *ihretoposos* & Species.
Ent. Nachr. x. pp. 237-250 & 269-280.

Includes bibliography and life-history.

Bates, *Biol. Centr. Am. Col.* v. pp. 238-247, notices the following species:—*Holothorax latithorax*, Thoms., fig. 12, *lavithorax*, White, fig. 15, pl. xvi., *Spondylis mexicanus*, fig. 1, *Xenambyx laticauda*, Bates,

fig. 3, *Malacopterus lineatus*, Guér. (= *mexicanus*, Thoms., and *Ganimus vilatus*, Lec.), *Hanmaticherus mexicanus*, Thoms. (= *castaneus*, Bates), *batus*, Linn., and *plicatus*, Oliv. (= *Cerambyx rufipennis*, Gory.); *Atylostagma*, White, is allied to *Xestia*, Serv.; *Gnaphalodes trachyderoides*, Thoms., var. *inermis* from Mexico; *Chion garganicus*, Fabr., and var. *ochraceus* from Mexico; *Perilasius championi*, fig. 2; *Eburia ulkei*, Bland, *blancaneauxi*, Bates, fig. 5, *pedestris*, White, var. *mutata* from Panama, *macrotenia*, fig. 9, and *championi*, fig. 6; *Eburoducrys callixantha*, Bates, *asperula*, *mexicana*, Thoms., fig. 17, pl. xvii., and var. *interrupta*.

The following known Japanese *Cerambycidae* are specially noticed by Bates, J. L. S. xviii. pp. 208-236:—*Megasemum quadricostulatum* and *Asemum amurense*, Kraatz, *Neocerambyx chrysothrix*, ♂, Bates, *Pachydissus* (*Mallambyx*) *japonicus*, Bates (= *Neocerambyx raddei*, Bless.), *Distenia japonica*, Bates (= *Apheles gracilis*, Bless.), *Rhagium inquisitor*, Linn., var. *japonicum*, *Omphalodera puziloi*, Bless., var. *flaviventris*, *Leptura succedanea*, Lew., and *variicornis*, Dalm., *Aromia ambrosiaca*, Stev., *Rosalia batesi*, Har., *Sympiezocera japonica*, Bates, *Phymatodes albicinctus*, Bates (= *Callidium albofasciatum*, Motsch.), *P. maaki*, Kraatz (= ? *Call. alni*, Bless.), *Plagionotus pulcher*, Bless. (= *Clytus lignatorum*, Thieme), *Clytanthus latifasciatus*, Fisch., *C. (?) acutungulus*, Kraatz, var. *inscriptus*, *Xylotrechus chinensis*, Chevr., and *Brachyclytus singularis*, Kraatz.

Criocephalus agrestis, Kirb., noticed as injurious to white pine in Canada; W. Saunders, Rep. Fruit-Growers' Ass. Ont. 1883, p. 323, and Rep. E. Soc. Ont. 1883, p. 53.

Chlorida cincta, Guér., white var. noticed; Dohrn, S. E. Z. xlv. p. 277.

Cerambyx miles, Bon. Transformations described; Horváth, Rov. Lapok, i. pp. 133-139, xvii., & xviii., figs. 33 & 34.

Exilia timida, Ménétr., var. *lugubris* from Sicily described and figured; Ragusa, Nat. Sicil. iii. p. 333, pl. iii. fig. 6.

Phlyctenodes trituberculatus, Redt. (= *tristis*, Fabr.). Structure noticed; Dohrn, t. c. pp. 281 & 282.

Rhagium mordax, De Geer. Parasites noticed; Fallou, Bull. Soc. Ent. Fr. (6) iii. p. cxxxvi.

Toxotus amurense, Kraatz, varieties noticed; Von Heyden, Deutsche E. Z. xxviii. p. 282.

Acmaeops pratensis, Laich., entering the ear; Harrington, Rep. E. Soc. Ont. 1883, pp. 36 & 37.

Gaurates, Le Conte. Species differentiated; Blanchard, Bull. Brooklyn Soc. vii. p. 108.

Leptura adustipennis, Solsky, and *thoracica*, Linn, varieties from Askold, and *L. anthura*, Bates, var. *diversipes* from the Amur, noticed; Von Heyden, t. c. pp. 282 & 298. *L. coccinea* and *atrata*, Lec., = *testacea*, Linn., and *proxima*, Say, respectively; Horn, Canad. Ent. xvi. p. 148.

Grammoptera variegata, Germ. The commoner form deserves a name, and may be called *nigrescens*; Weise, Deutsche E. Z. xxviii. pp. 423 & 424.

Brachypteroma ottomanum, Von Heyd., noticed; Bargagli, Bull. Ent. Ital. xvi. pp. 95 & 96.

Erionispa badeni, Chap., and *Pytheus pulcherrimus*, Pasc., are synonymous; allies also noticed; the genus belongs to the Longicornis: Lameere, C.R. ent. Belg. xxviii. pp. lxxx-lxxxiii. (cf. also Dohrn, S. E. Z. xlv. p. 282).

Aromia moschata, Linn. Monstrosities described: Schneider, Z. E. Ver. schles. (2) ix. p. xx.; Lameere, C.R. ent. Belg. xxviii. p. clxxviii. fig.

Sympiezocera laurasi, Luc. (= *Xenoderma bonvouloiri*, Mars.), and *japonica*, Lac., and ♀ of the latter, described; Lucas, Bull. Soc. Ent. Fr. (6) iv. pp. xlviii. & xlix. The former occurs in Algeria; *id. t. c.* pp. cii. & ciii.

Callidium lividum, Rossi, and *alni*, Linn.: note on habits of larvæ; Bargagli, *t. c.* pp. 93 & 94. *C. sanguineum* and *variabile*, Fabr.: habits and transformations noticed; Savard, Bull. Insect. Agric. ix. pp. 87-90 & 129-132. *C. (Physocnemum, Hald.) brevilineum*, Say: occurrence at Marseilles noticed; Fauvel & Abeille, Rev. d'Ent. iii. p. 355, note.

Rhopalopus femoratus, Linn. *Sirex juvenus*, auct., found in its galleries; Decaux, Feuill. Nat. xiv. p. 53.

Anisarthron barbipes, Charp. Transformations described; Heller, Verh. z.-b. Wien, xxxiv. pp. 119-122, fig.

Clytus podagricus, White, and *protogenes*, Newm., figured by Waterhouse, Aid. iii. pl. cxlix. figs. 4 & 5. *C. speciosus*, Schneid., popularly described and figured; W. Saunders, Rep. Fruit-Grower's Ass. Ont. 1882, p. 270, fig. 6. *C. tropicus*, Panz.: larvæ described; Decaux, *t. c.* pp. 54 & 54.

Glycobius speciosus, Schueid. Habits of larva, &c., described; Packard, Am. Nat. xviii. pp. 1151 & 1152.

Cyrtophorus gibbulus, Lec., = *Microclytus gazellula*, Hald.; Horn, *t. c.* p. 143.

New genera and species :—

Hololeprus, Gerstaecker, JB. Hamb. Aust. i. p. 60. Allied to *Hesperophanes*, but prothorax short, parallel, dentated on both sides, callous above, and elytra mucronate. Type, *H. variolosus*, sp. n., *ibid.*, Pangani.

Amphelictus, Bates, Biol. Centr. Am. Col. v. p. 242. Allied to *Hesperophanes*, &c., but with well-developed spines in the middle of the sides of the thorax. Type, *A. melas*, sp. n., *ibid.*, Mexico.

Allorhagium, Kolbe, Ent. Nachr. x. p. 250. Allied to *Rhagium*. Type, *R. inquisitor*, Linn. (= *indagator*, Fabr.; the N. American *lineatum*, Oliv., is hardly distinct).

Xenophyrama, Bates, J. L. S. xviii. p. 210. Allied to *Rhamnusium*, but elytra broad and oblong, surface opaque, and antennæ longer. Type, *X. purpureum*, sp. n., *ibid.* pl. i. fig. 1, Japan.

Lemula, *id. t. c.* p. 211. Has a superficial resemblance to a moderately slender *Lema*. Type, *L. decipiens*, sp. n., *t. c.* p. 212, pl. i. fig. 2, Japan.

Toxotinus, *id. t. c.* p. 213. Differs from *Toxotus*, &c., by the form of the posterior part of the head, and by the forehead being abruptly vertical from the base of the antennæ. Type, *T. longicornis*, sp. n., *ibid.* pl. i. fig. 6, Japan.

Eustrangalis, *id. t. c.* p. 221. Allied to *Leptura* (sect. *Stenura*); thorax

sulcate-constricted before and behind, and tuberculated on each side in the middle. Type, *E. distenoides*, sp. n., t. c. p. 222, pl. i. fig. 4, Japan.

Pyrrhona, Bates, t. c. p. 224. Allied to *Pyrotrichus*; 3rd and 4th joints of antennæ very short, thorax unarmed. Type, *P. laticolor*, sp. n., *ibid.* pl. i. fig. 8, Japan.

Corennys, *id. ibid.* Differs from *Pyrocalymma* in the form and clothing of the antennal joints. Type, *C. sericata*, sp. n., t. c. p. 225, pl. i. fig. 2, Japan.

Paraclytus, *id. t. c.* p. 234. Allied to *Anaglyptus* and *Cyrtophorus*, but 3rd joint of antennæ spineless in both sexes. Type, *P. excultus*, sp. n., *ibid.* pl. i. fig. 11, Japan.

Cleroclytus, Kraatz, Deutsche E. Z. xxviii. p. 225. Allied to *Anaglyptus*. Type, *C. semirufus*, sp. n., *ibid.*, Turkestan.

Xanthospila, Fairmaire, C.R. ent. Belg. xxviii. p. lxxvii. Allied to *Callichroma*. Type, *X. flavoplugiata*, sp. n., *ibid.*, E. Africa.

Atenizus simplex, Bates, Biol. Centr. Am. Col. v. p. 240, pl. xviii. fig. 2, Panama.

Smodicum parandroides, *id. t. c.* p. 241, pl. xviii. fig. 1, Mexico, Guatemala.

Xestia sanguinipes, *id. t. c.* p. 242, Nicaragua, Panama.

Eburia patruelis, p. 244, *rotundipennis*, fig. 15, *clara*, fig. 16, p. 245, and *nigrovittata*, p. 246, *id. t. c.* pl. xvii., Mexico.

Eburodacrys levicornis, Panama, Venezuela, and *coalescens*, pl. xvii. fig. 14, Nicaragua, *id. t. c.* p. 247.

Hypermallus decipiens (= *Romaleum atomarium*, Bates, nec Drury) and *senex*, *id. t. c.* p. 248, Mexico.

Pachyta erebia, *id. J. L. S.* xviii. p. 212, Japan.

Gawwotes doris, *id. ibid.*, Japan.

Leptura misella, pyrrha, p. 216, *granulata*, *excavata*, p. 217, *L. (Judolia) cometes*, *L. (Stenura) vicaria*, p. 218, *L. (S.) mimica*, *L. (S.) subtilis*, p. 219, *L. (S.) adumbrata*, and *L. (S.) nymphula*, p. 221, *id. t. c.*

Strangalomorpha anescens, *id. t. c.* p. 221, Japan.

Grammoptera merkli, Frivaldszky, Term. füzetek, viii. p. 4, Asia Minor; *G. ægrota*, *grallatrix*, p. 214, *signifera*, *amentata*, p. 215, and *chalybeella*, p. 216, Bates, t. c.

Strangalia dulcis, p. 222, *contracta* and *regalis*, p. 223, *id. t. c.*, Japan.

Ephies palliatus and *ligystropteroides*, Van Lansberge, Notes Leyd. Mus. vi. pp. 91 & 92, Sumatra.

Encyclops olivaceus, Bates, t. c. p. 211, pl. i. fig. 7, Japan.

Necydalis solida and *ebenina*, *id. t. c.* p. 225, Japan.

Phyllocnema petalophora, Fairmaire, C.R. ent. Belg. xxviii. p. cxlviii., E. Africa.

Hypatium cærulans, *id. ibid.*, E. Africa.

Chloridolum thaliodes, Bates, t. c. p. 226, Japan.

Chelonarium quadricolle, *id. ibid.*, Japan.

Closteromerus argyrophorus, Fairmaire, t. c. p. lxxvii., E. Africa.

Litopus patricius, Gerstaecker, J.B. Hamb. Aust. i. p. 60, Pangani.

Euporus partitus, *id. ibid.*, Pangani.

Clyanthus misellus and *xeniscus*, Bates, *t. c.* pp. 228 & 229, Japan.

Clytus melanus and *auripilis*, *id. t. c.* p. 230, Japan.

Platynotus platessa and *foveipennis*, Fairmaire, C.R. ent. Belg. xxviii. pp. cxxiv. & cccxlvii., E. Africa.

Anaglyptus niponensis, *id. t. c.* p. 234, Japan; *A. angustefasciatus*, Von Heyden, Deutsche E. Z. xxviii. p. 297, Vladivostok.

Xylotrechus emaciatus, *clarinus*, p. 231, *albifilis*, p. 232, and *rufilius*, p. 233, Bates, *t. c.*, Japan.

Aglaophis colobothoides, Bates, *t. c.* p. 235, pl. i. fig. 12, Japan.

Demonax transilis, *id. t. c.* p. 229, Japan; *D. vethi*, Ritsema, Notes Leyd. Mus. vi. p. 181, Sumatra.

Lamiides.

Waterhouse, Aid, iii., figures *Rhytiphora caprina* and *Penthea pardalis*, Newm., pl. cxliv. figs. 4 & 5, and *Calliphenges cuprascens* and *Megacriodes forbesi*, Waterh., pl. cxlix. figs. 3 & 6.

Oncoderes amputator, Fabr., *romicosa*, Germ. (= *saga*, Dalm.), and *Taniotes* (*Hammoderus*) *buqueti*, Thoms., noticed as cutting off small branches of trees; Lucas, Bull. Soc. Ent. Fr. (6) iv. p. cxiii.

Dorcadion minutum, Kraatz, var. *brenskei* (cf. Deutsche E. Z. xxviii. p. 99) from Corinth, p. 450, *atticum*, Kraatz, var. *corcyricum* from Corfu, p. 453, *divisum*, Germ., var. *dissimile* from Turkey and *granigerum* from Attica, p. 458, *equestre*, Laxm., var. *transsilvanicum* from Servia, &c. p. 462, and *ribbei*, Kraatz, var. *corallipes* from Tarbagatei, p. 476, described; Ganglbauer, Verh. z.-b. Wien, xxxiii. *D. carinatum*, Pall.: abstract of Lindeman's observations; Ent. Nachr. x. pp. 148-152. *D. mus*, Rosenh., and *amorii*, Mars., discussed; they are probably distinct species: Martinez y Saez, An. Soc. Esp. xiii. (Actas); pp. 45-47.

Monohammus confusor, Kirby, and *scutellatus*, Say, noticed as injurious to the white pine; transformations popularly described and beetles figured: W. Saunders, Rep. E. Soc. Ent. 1883, pp. 52 & 53, figs. 19 & 20, and Rep. Fruit-Growers' Ass. Ent. 1883, pp. 322 & 323, figs. 19 & 20. *M. confusor*: oviposition described; Packard, Am. Nat. xviii. pp. 1140-1151. *M. ligatus*, De Geer; transformations noticed; W. Saunders, Rep. Fruit-Growers' Ass. Ent. 1883, p. 273.

Butocera rubus, Fabr., slight variety from Larat noticed; Waterhouse, P. Z. S. 1884, p. 218.

Plectrodera scalator, Fabr., noticed; Shufeldt, P. U. S. Nat. Mus. vii. p. 338.

Hypsioma gemmatu, Blanch., noticed; Dohrn, S. E. Z. xlv.

Oncideres cingulatus, Say, noticed and figured; W. S. p. 181. p. 273, fig. 11.

Calamobius japonicus, Bates. Structural characters & ... J. L. S. xviii. p. 255.

[*Onychocerus scorio*, Fabr.] "*Scorpionus*" using its antennae as offensive weapons; H. H. Smith, Am. Nat. xviii. p. 727 & 728.

Saperda candida, Fabr.: oviposition noticed; W. Saunders, Rep. E. Soc. Ent. 1883, p. 16, and Canad. Ent. xv. p. 203. *S. interrupta*, Gebl.: noticed; Von Heyden, Deutsche E. Z. xxviii. p. 292. *S. scalaris*, Linn.:

notes on habits; Fallou & Masson, Bull. Soc. Ent. Fr. (6) iii. pp. cxxxiv.-cxxxvi. & cxlix.

Paräglenea, Bates. Generic characters noticed by him; *t. c.* p. 258. *P. chrysochloris*, Bates, noticed; p. 256.

Phytacia molybdæna, Dalm., noticed; Weise, Deutsche E. Z. xxviii. p. 423. *P. puncticollis*, Fald., varr. *persica* and *stygia* from Persia, and *pustulata*, Schrank, var. *adulta* from Astrabad, described; Ganglbauer, *t. c.* p. 572.

Eumecocera impulsata, Motsch., noticed; Von Heyden, *t. c.* p. 292.

Stenostola ferrea, Schrank, confounded with *Agapanthia cyanea*, Herbst, in Belgium; Lameere, C.R. ent. Belg. xxviii. pp. liv. & lv.

Oberca vittata, Bless. (= *sylvia*, Pasc.), and *hebesens*, Bates, noticed; *O. japonica*, Bates (nec Thunb.), renamed *niponensis*: Bates, *t. c.* p. 260.

New genera and species :—

Phlyctidola, Bates, J. L. S. xviii. p. 236. Allied to *Deucalion*, but nearer *Parmena* in form. Type, *P. metallica*, sp. n., *t. c.* pl. i. fig. 9, Japan.

Neodorcadion, Ganglbauer, Verh. z.-b. Wien, xxxiii. p. 437, fig. 2. To include the section of *Dorcadion* in which the clypeus is horizontally truncated, as in *Lamia*, &c., leaving a membranous epistoma free. The following species are noticed as belonging to it:—*D. virleti*, Brullé, *lineatum*, Germ., *fallax*, Kraatz, *laqueatum*, Waltl, *segne*, Muls., *exornatum*, Friv., *balcanicum*, Tourn., *pelleti*, Muls., *humerales*, Gebl., *involvens*, Fisch., *virgatum*, Motsch., *brandti*, Gebl., *ornatum*, Fald., and var. *exaratum*, Motsch., and *N. glaucopterum*, sp. n., *t. c.* p. 511, N. China.

Compsodorcadion, *id.* *t. c.* p. 437. Subgenus of *Dorcadion*; antennæ smooth and shining, not pubescent above, except on the terminal joint. To include *D. gebleri*, Kraatz, *glycyrrhiza*, Pall., *rufifrons*, Motsch., and *politum*, Dalm.

Dolophrades, Bates, *t. c.* p. 237. Intermediate between the *Dorcadionina* and *Lamiinae*. Type, *D. terrenus*, sp. n., *t. c.* p. 238, pl. i. fig. 10, Japan.

Haplohammus, *id.* *t. c.* p. 239. Allied to *Monohammus*; differs by the smoother antennal scape, and the less abruptly truncated and smoother clypeus, the bordering rim of which is much less complete. To include *M. pubicornis*, Pasc., *luculentus*, *fraudator*, *sejunctus*, and *degener*, Bates, from Japan; many Indo-Malayan and Australasian species; and perhaps some of the species described by Pascoe under *Orsidia*.

Tricholamia, Bates, Ent. M. M. xxi. p. 14. Allied to *Monohammus*. Type, *T. plagiata*, sp. n., *t. c.* p. 15, Cameroons.

Batomena, *id.* *t. c.* p. 15. Allied to *Monohammus*. Type, *B. multipennis*, sp. n., *ibid.*, Cameroons.

Mecynippus, *id.* J. L. S. xviii. p. 240. Differs from *Thestus* in the long antennal spine and plane mesothorax, and from *Goes* in the short antennal scape, and the long and acute tubercle of the middle tibiae. Type, *M. pubicornis*, sp. n., *t. c.* p. 241, pl. ii. fig. 12, Japan.

Melanopolia, *id.* Ent. M. M. xxi. p. 15. Allied to *Domitia*, but middle tibiae with tubercle and groove near the middle of their outer edge. To

include *M. frenata* and *farinosa*, p. 16, and *convexa*, p. 17, spp. nn., t. c., Gaboon.

Noserocera, Bates, t. c. p. 17. A connecting link between the *Monohammineæ* and *Phrynetides*. Type, *M. tuberosa*, sp. n., *ibid.*, Cameroons.

Apulimna, *id.* J. L. S. xviii. p. 241. Allied to *Palimna*, but thorax with large conical lateral tubercles. Type, *A. liturata*, sp. n., t. c. p. 242, pl. ii. fig. 5, Japan; add *A. ducalis*, sp. n., t. c. p. 242, note, N. India.

Xenicotela, *id.* t. c. p. 242. Allied to *Xenalea*, but scape smooth, with the cicatrice narrow and sharply margined. Type, *X. fuscula*, sp. n., t. c. pl. ii. fig. 2, Japan.

Nanohammus, *id.* t. c. p. 243. Differs from *Olenohammus* in the straight outer edge of the intermediate tibiæ. Type, *N. rufescens*, sp. n., t. c. p. 244, pl. ii. fig. 4, Japan.

Mesosella, *id.* t. c. p. 246. Differs from *Mesosa* in the absence of cicatrice from the scape. Type, *M. siniola*, sp. n., t. c. pl. ii. fig. 3, Japan.

Spodotania, Fairmaire, C.R. ent. Belg. xxviii. p. lxxvii. Allied to *Niphona*. Type, *S. basicornis*, sp. n., *ibid.*, E. Africa.

Diazenes, Waterhouse, Ann. N. H. (5) xiii. p. 128. Allied to *Apomecyna*, but differs in the proportions of the antennal joints, the even surface of the thorax, and less parallel form. Type, *D. taylori*, sp. n., *ibid.*, Philippines (?).

Xylariopsis, Bates, t. c. p. 247. Allied to *Atimura*. Type, *X. minima*, sp. n., *ibid.* pl. ii. fig. 7, Japan.

Graphidessa, *id.* t. c. p. 248. Differs from *Tetrorea* in the more oblong, less clavate scape, the shorter 3rd joint, and less pilose antennæ, and in the less clavate femora. Type, *G. venata*, sp. n., *ibid.*, Japan.

Terinea, *id.* t. c. p. 249. Allied to the *Apodasyides* of Lacordaire, but with the intermediate tibiæ deeply sinuated. Type, *T. atrofusca*, sp. n., t. c. p. 250, pl. ii., fig. 6, Japan.

Cylindilla, *id.* t. c. p. 250. Allied to the *Apomecyninae*, but with divaricate claws. Type, *C. grisea*, sp. n., *ibid.*, Japan.

Eryssamena, *id.* t. c. p. 251. Allied to *Polimeta*, but front not elevated. To include *E. saperdina*, p. 251, *acuta* and *spinidorsis*, pl. ii. fig. 10, p. 252, spp. nn., t. c., Japan.

Miccolamia, *id.* *ibid.* Allied to *Phlyarus*. To include *M. cleroides*, pl. ii. fig. 11, *verrucosa* and *glabricula*, spp. nn., t. c. p. 253, Japan.

Clytosenia, *id.* t. c. p. 253. Differs from *Ostodes*, &c., in the absence of erect hairs or setæ. Type, *C. dulcera*, sp. n., t. c. p. 254, pl. ii. fig. 9, Japan.

Callapæcus, *id.* t. c. p. 254. An isolated form of *Acanthoderinae*. Type, *C. guttatus*, sp. n., *ibid.* pl. ii. fig. 1, Japan.

Eutetrappa, *id.* t. c. p. 256. Differs from *Saperda* in the carinated sides of the elytra. To include *S. carinata*, Bless., *metallesca*, Motsch., *Glenea ocelota*, Bates, and *E. variicornis* and *chrysargyrea*, spp. nn., *ibid.*, Japan.

Epiglenea, *id.* t. c. p. 259. An aberrant form resembling *Glenea*. Type, *E. comes*, sp. n., *ibid.*, Japan.

Praolia, *id.* t. c. p. 261. Allied to *Sericia*; but tarsal claws with a

dilatation at the base with a distinct angular or pointed edge. Type, *P. citrinipes*, sp. n., *ibid.* pl. ii. fig. 8, Japan.

Echthistatus farciferus and *grossus*, Bates, J. L. S. xviii. p. 237, Japan.

Dorcadion simile, Kraatz, Deutsche E. Z. xxviii. p. 234, Malatia, Asia Minor; *D. destinoi*, Fairmaire, Ann. Soc. Ent. Fr. (6) iv. p. 173, Akbès; *D. hybridum*, Balkans, p. 441, *krueperi*, Thessaly, Macedonia, p. 453, *certzeni*, Attica, *litigiosum*, Moldavia, Dobrudscha, p. 454, *korbi*, Arragon, p. 469, *songaricum*, Songaria, Ala Tau, p. 477, *semenovi*, Turkestan, p. 479, *deyrollei*, Tiflis, p. 482, *cingulatum*, p. 484, *complanatum*, Persia, p. 485, *hellmanni* (Friv., MS.), *tuerki*, p. 486, *plasoni*, Persia, p. 491, *reitteri*, Svanetia, p. 492, *faldermanni*, Persia, p. 493, *robustum*, Amasia, p. 500, *funestum*, Mytilene, p. 501, *variegatum* (Kraatz, MS.), Syria, p. 502, and *merkli*, Asia Minor, p. 506, Ganglbauer, Verh. z.-b. Wien, xxxiii.

Nemophas forbesi, Waterhouse, P. Z. S. 1884, p. 218, pl. xvi. fig. 5, Maroe, Larat.

Epepeotes schlegelii, Van Lansberge, Notes Leyd. Mus. vi. p. 90, Sumatra.

Pelargoderus rugosus, Waterhouse, t. c. p. 218, Larat.

Monohammus pictor, Cameroons, and *x-fulvum*, Gaboon, Angola, Bates, Ent. M. M. xxi. pp. 17 & 18; *M. nitens* and *pardalinus*, *id.* J. L. S. xviii. pp. 238 & 239, Japan.

Uræcha griseola, Bates, J. L. S. xviii. p. 240, Japan.

Mesosa gracilior, *hirsuta*, p. 244, *senilis*, *pæcila*, and *cribrata*, p. 245, *id.* t. c., Japan.

Agelasta obscura, Macleay, P. Linn. Soc. N. S. W. ix. p. 707, Maclay Coast, New Guinea.

Coptops pyramidalis, Fairmaire, S. E. Z. xlv. p. 139, Madagascar.

Anoplostetha pauli, Fairmaire, C.R. ent. Belg. xxviii. p. cxxiv., E. Africa.

Ceroplesis pauli, *id.* t. c. p. cxlviii., E. Africa; *C. lucunosa*, Gerstaecker, JB. Hamb. Anst. i. p. 61, Pangani.

Rhodopis integripennis, Bates, t. c. p. 243, Japan.

Dichostates capucinus, Gerstaecker, t. c. p. 62, Pangani.

Atimara ascoldensis, Von Heyden, Deutsche E. Z. xxviii. p. 298, Ascold.

Sybra sulfasciata, Bates, t. c. p. 246, Japan.

Eupogonius tenuicornis, *id.* t. c. p. 249, Japan.

Sydonia divaricata, *id.* t. c. p. 247, Japan.

Pogonocherus plasoni, Ganglbauer, t. c. p. 526, Greece.

Tetraglenes pauli, Fairmaire, C.R. ent. Belg. xxviii. p. lxxvii., E. Africa.

Liopus syriacus, Beyrout, and *pachymerus*, Caucasus, Ganglbauer, t. c. p. 532.

Acanthocinus stillatus, Bates, t. c. p. 254, Japan; *A. elegans*, Ganglbauer, t. c. p. 534, Caspian.

Pithomictus irroratus, Macleay, t. c. p. 707, Maclay Coast, New Guinea.

Exocentrus stierlini, Ganglbauer, t. c. p. 530, Germany, Austria.

Agapanthia lateralis (Friv., M.S.), Constantinople, Asia Minor, *sicula*, Sicily, p. 541, *daurica*, Dauria, Amur, p. 544, and *frivaldszkyi*, Asia Minor, p. 546, Ganglbauer, *t. c.*

Paraglenea eximia and *theaphia*, Bates, *t. c.* p. 257, Japan.

Singalia rufescens, *id. t. c.* p. 258, Japan.

Phytacia speciosa, Frivaldszky, Term. füzetek, viii. p. 5, Armenia; *P. baberi* (= *flavipes*, Gyll., *nec* Fabr.), Caucasus, Turkey, p. 559, *merkli*, Turkey, Cilicia, p. 560, *eugeniae*, p. 568, *fatima*, p. 570, *plasoni*, Persia, p. 571, *kurdistan*, Persian Khurdistan, p. 572, *bithynensis*, Brussa, p. 573, *ferrugata*, Syria, *pontica*, Pontus, Caucasus, p. 574, and *tuerki*, Brussa, p. 575, Ganglbauer, *t. c.*

Mallosia ganglbaueri, Kraatz, *t. c.* p. 233, Malatia, Asia Minor.

Stenostola argyrosticta and *anomala*, Bates, *t. c.* pp. 258 & 259, Japan.

Oberea sericans, *id. t. c.* p. 260, Japan.

CHRYSOMELIDÆ.

JACOBY, M. Description of new genera and species of Phytophagous *Coleoptera* from the Indo-Malayan and Austro-Malayan sub-regions, contained in the Genoa Civic Museum. First Part. Ann. Mus. Genov. xx. pp. 188-233.

— . Descriptions of new genera and species of Phytophagous *Coleoptera*, collected by H. Hagen at Serdang, East Sumatra. Notes Leyd. Mus. vi. pp. 201-230.

Both papers also include notices of various known species.

LEESBERG, A. F. A. Bijdrage tot de kennis der inlandsche Galerucinen. Tijdschr. Ent. xxvii. pp. 229-243.

Chiefly of local interest.

WEISE, J. Naturgeschichte der Insecten Deutschlands, begonnen von W. F. Erichson, fortgesetzt von H. Schaum, G. Kraatz, H. v. Kiesenwetter, J. Weise, und E. Reitter. Erste Abtheilung, *Coleoptera*. 6ter Band, 3te Lieferung. Berlin: 1884, pp. 369-568, pl. i. (Cf. Fairmaire, Wien. ent. Z. iii. p. 3.)

Includes the completion of *Chrysomelini* and the first two pages of *Galerucini*. A great number of varieties are named, which cannot be further mentioned here. The plate illustrates penes of *Orina*.

List of *Chrysomelidæ* of Amasia, with descriptions of 7 new or little-known species; Weise, Deutsche E. Z. xxviii. pp. 157-160.

Chrysomelidæ found on hop in N. America; Riley, Bull. Dep. Agric. Ent. iv. p. 50.

List of *Chrysomelidæ* collected by Fromont in Brazil and La Plata; Donckier and others, C.R. ent. Belg. xxviii. pp. cli.-clviii.

Sagrides.

Sagra puncticollis, Jacoby, Ann. Mus. Genov. xx. p. 188, Timor, Flores; *S. longefemorata*, Fairmaire, C.R. ent. Belg. xxviii. p. cxxiv, E. Africa: spp. nn.

Donaïdes.

Donacia malinovskii recorded as new to France; Demaison, Bull. Soc. Ent. Fr. (6) iii. p. cxiv.

Hamonia chevrolatii, Lac. The larva feeds on both *Potamogeton* and *Scirpus*, and is probably destroyed by *Aphelochira æstivalis*; Bellevoye, Bull. Soc. Ent. Fr. (6) iv. pp. xcvi. & xcvi.

Hamonia flohri, sp. n., Jacoby, S. E. Z. xlv. p. 126, Mexico.

Criocerides.

Lema hamatomelas, Lac., var. from Sumatra, and *histris*, Clark, varr. from Celebes & Timor, noticed; Jacoby, Ann. Mus. Genov. xx. pp. 192 & 193. *L. hamatomelus, palpalis*, and ? *fulvula* (? = *coromandeliana*), Lac., noticed; id. Notes Leyd. Mus. vi. pp. 201 & 202. *L. merdigeri*, Linn.: deformed specimen from Vladivostok noticed; Von Heyden, Deutsche E. Z. xxviii. p. 286.

Lema dimidiata, Java, p. 189, *flavosignata*, Somerset, Australia, p. 190, *gestroi*, Sumatra, Java, p. 191, and *beccarii*, Sumatra, p. 192, Jacoby, Ann. Mus. Genov. xx.; *L. separata* and *wallacei*, id. Notes Leyd. Mus. vi. pp. 9 & 10, Sumatra; *L. patagonica*, Fairmaire, Ann. Soc. Ent. Fr. (6) iii. p. 504, Patagonia: spp. nn.

Plectonycha fromonti, sp. n., Donckier, C.R. ent. Belg. xxviii. p. clii., Rio Janeiro.

Crioceris chamelus, id. t. c. p. cccx., Australia; *C. oschanini*, Dohrn, S. E. Z. xlv. p. 40, Turkestan; *C. celebensis*, Jacoby, Ann. Mus. Genov. xx. p. 193, Celebes: spp. nn.

Clytrides.

Table of French genera and species; Fauconnet, Feuill. Nat. xiv. pp. 93-98.

Lachmæa serpuntata, Scop., var. *pontica* from Amasia noticed, and *Gynandrophthalma biornata*, Lef., redescribed; Weise, Deutsche E. Z. xxviii. p. 157.

Clytra, Laich., = *Melolontha*, Geoffr. (nec Fabr.), the type of which is *4-punctata*, Linn; Bergroth, B. E. Z. xxviii. p. 230. *C. (Diapromorpha) pinguis*, Lac., noticed; Dohrn, S. E. Z. xlv. p. 41.

Coptocephala rubicunda, Laich. Variation described; Letzner, JB. schles. Ges. lxi. pp. 307 & 308.

New species:—

Labidostomis amurensis, Von Heyden, Deutsche E. Z. xxviii. p. 299, Askold.

Mionariis venustula, Lefevre, Bull. Soc. Ent. Fr. (6) iii. p. civ., Cape of Good Hope.

Camptolenes cingulata, id. *ibid.*, Aden.

Titubæa rivicola, id. C.R. ent. Belg. xxviii. p. cclxxxi., Congo.

Clytra zairica, id: *ibid.*, Congo; *C. insularis*, id. Bull. Soc. Ent. Fr. (6) iii. p. cxxi., Andamans.

Peptoptera pusilla, id. t. c. p. cxxii., Senegal.

- Aspidolopha ornata*, Jacoby, Notes Leyd. Mus. vi. p. 11, Sumatra.
Melitonoma puncticollis, Sierra Leone, and *gounellei*, Abyssinia, Lefèvre, t. c. pp. cxi. & cxvii.
Gynandrophthalma fabrei, p. cxi., *terminalis*, India, and *litturata*, Abyssinia, p. cxii., *id. t. c.*
Coptocephala insignita, *id. t. c.* p. cxvii., Abyssinia; *C. destinoi* and *fallaciosa*, Fairmaire, Ann. Soc. Ent. Fr. (6) iv. pp. 174 & 175, Akbès.

Cryptocephalides.

List of *Cryptocephalides* collected in Brazil and La Plata by Van Volxem; Tappes, C.R. ent. Belg. xxviii. pp. cclv. & cclvi.

Melicanthus bimaculicollis, Baly. Antennæ described; Jacoby, Notes Leyd. Mus. vi. p. 12.

Disopus, Redt., can hardly be separated from *Cryptocephalus*; Weise, Deutsche E. Z. xxviii. p. 424.

Cryptocephalus prusias, Suffr., noticed, and *C. aurcolus*, Suffr., and *sericeus*, Linn., differentiated; *id. t. c.* pp. 158 & 424. *C. 6-punctatus*, Linn., var. *simplarius* from Askold described; Von Heyden, Deutsche E. Z. xxviii. p. 284. *C. fuscilopunctatus*, Suffr., discussed; Dohrn, B. E. Z. xlv. p. 289.

Melicanthus sumatrensis, sp. n., Jacoby, Notes Leyd. Mus. vi. p. 12, Sumatra.

Cryptocephalus ellipsoidalis, Casey, Bull. Brooklyn Soc. vii. p. 60, Massachusetts, Long Island; *C. fulvofasciatus*, Jacoby, Ann. Mus. Genov. xx. p. 194, New Guinea; *C. euchlorus*, p. 182, parenthesis, p. 279, and *discissus*, p. 280, Dohrn, S. E. Z. xlv., Madagascar; *C. egerickxi*, Tappes, C.R. ent. Belg. xxviii. p. cclvi. fig., Arabia; *C. amurensis*, Von Heyden, Deutsche E. Z. xxviii. p. 299, Askold and (var.), Amur; *C. variceps*, Constantinople, and *C. (Proctophysus) moehringi*, Amasia, Weise, Deutsche E. Z. xxviii. pp. 161 & 158 : spp. nn.

Pachybrachys caroli, sp. n., Marseul, Nouv. et faits, ii. p. 188, "O. Chair" [*sic*].

Eumolpides.

Chalcoparia, Crotch, = *Chrysodina*, Baly; *Olisithera nigricornis*, Baly, = *cerasina*, Perty; *Alphites clavipalpus*, Chap., is a *Eumolpus*, redescribed by Baly as *E. separatus*; Amasia, Chap., being preoccupied, Dejean's name *Hylax* is preferable; *Noda convexa*, Say, and *pilula*, Germ., = *tristis*, Oliv.; *N. fraterna*, Lef., = *semicostata*, ♀, Lef.; *Metaxyonycha gigas*, Baly, = *tejuana*, Marsh.; *M. retifera*, Baly, is an *Endocephalus*; *Colaspis lefebvrei*, Baly, = *eumolpoides*, Lef.; *lurida*, Oliv., is a *Meta-chroma*; *Gelopectera vestita*, Baly, = *Hypoderes denticollis*, Lef.; *Scelodonta vittata*, Chap., nec Oliv., renamed *chapuisi*; and *Euryope ruficornis*, Fairm., = *marginalis*, Ancey; Lefèvre, Bull. Soc. Ent. Fr. (6) iv. pp. xlv. & xlvi.

Nodostoma lateralis, Baly, nec Motsch., renamed *balyi*; *N. balyi*, Jac., nec Har., renamed *jacobyi*; *Myochrous denticollis*, Boh., nec Say, renamed *bohemanni*; and *Typophorus minutus*, Jac., nec Lef., renamed *jacobyi*: *id. t. c.* p. lxxvi.

Colaspis brunnea, Fabr., figs. 7 & 8, *Paria aterrima*, Oliv., figs. 1, 4, & 6, and *Scelodonta nebulosus*, Lec. [erroneously *pubescens*, Mels.], figs. 2, 3, & 5. Life-histories described and figured; Forbes, Psyche, iv. pp. 123-130, 167, & 168, pl. i.; *id.* Rep. Ins. Illin. xiii. pp. 150-177, pls. xiii. figs. 1-4, & ix. figs. 3-5.

Jacoby, Notes Leyd. Mus. vi., notices Baly's *Nodostoma cneipennis* and *javanensis* (variation); *M. aneomicans* should form a new genus, pp. 14 & 15; *Colasposoma nigriventre*, (variation), p. 22; *Corynodes fraternus*, from Sumatra, pp. 24 & 25; *Aoria nigripes* and *Rhyparida pinguis* (? = *ovalis*), pp. 203 & 204.

Rhyparida basalis, Baly, varr. from New Guinea and Australia, pp. 198 & 199, *trilineata*, Baly, var. from New Guinea, p. 202, *didyma*, Fabr., var. *fulcoplagiata* from Somerset, Australia, p. 210; *Nodostoma picipes*, *gratum*, and *evanescens*, Baly, variation, &c., noticed, pp. 219-225: Jacoby, Ann. Mus. Genov. xx.

Paria aterrima, Oliv., noticed as injurious to strawberries in Ohio; Crawford & Riley, Bull. Dep. Agric. Ent. iv. pp. 88 & 89.

New genera and species:—

Phaseus, Lefèvre, Bull. Soc. Ent. Fr. (6) iv. p. lxvi. Belongs to the *Odentomaphites*. To include *P. maculatus* and *pallidus*, *Abyssinia*, and *fulvus*, Zanzibar, spp. nn., *ibid.*

Pagria, *id.* t. c. p. lxvii. Will form a new group (*Pagriites*), near to *Nodostomites*. Types, *P. suturalis* and *varians*, spp. nn., *ibid.*, Zanzibar.

Malegia, *id.* op. cit. iii. p. cxv. Allied to *Damelia*, but anteunæ shorter, and elytra not tuberculated. To include *M. striatula*, Zanzibar, p. cxvi., *obscura*, Abyssinia, and *letourneuxi*, Egypt, p. cxvii., spp. nn., *t. c.*

Melindea, *id.* op. cit. iv. p. lxv. Differs from *Trichostola* and *Spharopis* by its dentated femora, &c. Type, *M. abyssinica*, sp. n., *ibid.*, Abyssinia.

Plastomothus, *id.* t. c. p. xlv. A transitional form between the *Eumolpides* and *Lamprosomides*. Types, *Noda aureus* and *chalybeus*, Blanch.

Cleoporus, *id.* t. c. p. lxxvi. Allied to *Manius*, but femora unarmed, prosternum subquadrangular, and hind tibiæ hardly curved. Type, *C. cruciatus*, sp. n., *ibid.*, Philippines.

Pseudolpus, Jacoby, Ann. Mus. Genov. xx. p. 225. Differs from *Chrysopida*, Baly, in the shape of its antennæ, the unarmed femora, appendiculate claws, and the small but distinct tooth in the middle of the thorax. Type, *P. ornatus*, sp. n., *ibid.*, New Guinea, Jobi.

Phytorus, *id.* t. c. p. 226. *Typophorinæ*; elytra dilated, epipleura much widened and concave, thorax transversely convex. Type, *P. dilatata*, sp. n., *ibid.*, Singapore, Java.

Thyrusia, *id.* t. c. p. 228. *Typophorinæ*; eyes very large, space between less than their diameter; anterior femora with a large triangular tooth; claws appendiculate; thoracic episternum with very convex anterior margin. Type, *T. marginata*, sp. n., *t. c.* p. 229, New Guinea.

Entomochirus, Lefèvre, C.R. ent. Belg. xxviii. p. cc. *Colaspites*. To include *E. sericeus*, p. cc., *dispar*, *cribrosus*, Cayenne, and *jucundus*, Caracas, p. cci., spp. nn., *t. c.*

Edistus, Lefèvre, t. c. p. ccii. Allied to *Callisina*; femora not dentated, Type, *E. fulgidus*, sp. n., t. c. p. cciii, Bntang.

Erotenia, id. t. c. p. cciv. *Corynodites*. Type, *E. nigripes*, sp. n., *ibid.*, Brazil.

Aporus, id. t. c. p. ccv. *Endocephalites*. Type, *A. cyaneus*, sp. n., t. c. p. ccvi, Cayenne.

Spintherophyta cyanea, Mexico, and *aulica*, Brazil, Lefèvre, C.R. ent. Belg. xxviii. pp. ccxiii. & ccxiv.

Chrysodina ephippium, id. t. c. p. ccxiv., Brazil.

Lamprosphaerus histrionalis and *apicipennis*, id. t. c. p. cclxxxii., Bogota.

Agrianes versicolor, id. t. c. p. ccxiv., Brazil.

Chrysolampra cyanea, id. *ibid.*, N. China.

Iphimeis fuscitarsis, id. t. c. p. clviii., Bahia.

Agbalus hilaris, Cayenne, Brazil, *klugii*, Brazil, *strigatus*, p. ccxv., and *cyanipes*, Cayenne, p. ccxvi., id. t. c.

Metaxyonycha lacerda, Bahia, p. cxx., *formosa*, Cayenne, p. cxlix., *elegans* and *concinna*, Brazil, p. cl., id. Bull. Soc. Ent. Fr. (6) iii.

Colaspis foveolata, Buenos Aires, *varia*, Buenos Aires, Bahia, p. clv., and *pusilla*, Bahia, p. clvi., *aureopunctata*, p. ccxvi., *nobilitata*, *egena*, *exarata*, p. ccxvii., *sulcogemmata*, *pertusa*, *melanogaster*, Brazil, *picta*, Colombia, p. ccxviii., *crotchii* (= *brunnea* var. *costipennis*, Crotch), Carolina, *dissectella*, *cribricollis*, Brazil, *rufo-femorata*, Colombia, *despecta*, p. ccxix., and *pumilio*, Peru, p. cc., id. C.R. ent. Belg. xxviii.; *C. dejeani*, Cayenne, Brazil, *chalcites*, *lividipes*, Peru, p. cxx., and *area*, Cayenne, Buenos Aires, p. cxxi., id. Bull. Soc. Ent. Fr. (6) iv.; *C. chapuisi*, Jacoby, S. E. Z. xlv. p. 127, Mexico.

Prionodera metallica, id. t. c. p. 128, Amazons; *P. marshalli*, Lefèvre, C.R. ent. Belg. xxviii. p. ccxvi., Brazil.

Corysthea humilis, id. t. c. p. cci., Amazons.

Chalcophana scapuluris, Ecuador, and *volcremi*, Brazil, id. t. c. pp. cci. & ccii.

Geloptera albertisii, Jacoby, Ann. Mus. Genov. xx. p. 227, Somerset Australia.

Dermorrhitis femoralis, Somerset, Australia, and *viridis*, Celebes, id. t. c. pp. 229 & 230.

Nodostoma laevicollis, Sumatra, p. 213, *beccarii*, Java, p. 214, *ornatissima*, New Guinea, p. 215, *violacea*, Celebes, p. 216, *marginata*, Java, *sumatrensis*, Sumatra, Java, p. 217, *aruensis*, Aru, p. 218, *rugosa*, Sarawak, *dilatocornis*, p. 220, *gestroi*, Sumatra, p. 221, *balyi*, p. 222, *simplex*, Java, p. 223, and *nigritarsis*, Sumatra, p. 224, id. t. c.; *N. brevicollis*, id. Notes Leyd. Mus. vi. p. 13, Sumatra.

Callisina integricollis, id. t. c. p. 202, Sumatra.

Scelodonta aurosignata, Lefèvre, Bull. Soc. Ent. Fr. (6) iii. p. cl., Natal.

Piomera (?) *celebensis*, Jacoby, Ann. Mus. Genov. xx. p. 195, Celebes.

Pseudocolaspis pedestris, Lefèvre, C.R. ent. Belg. xxviii. p. cclxxxi., Congo.

Eurytus pedestris, id. t. c. p. cciii., Cape.

* *Rhyparida bicolor*, Sumatra, p. 196, *strigicollis*, Ternate, p. 197, melan-

cholica, p. 198; *terminata*, *opacipennis*, New Guinea, p. 199, *subcostata*, Java, p. 200, *lavifrons*, New Guinea, p. 201, *morosa*, Australia, New Guinea, p. 202, *nigrosignata*, Sumatra, p. 203, *clypeata*, Australia, p. 204, *castanea*, New Guinea, p. 205, *sublevicollis*, Amboina, *quadripustulata*, New Guinea, p. 206, *apicalis*, p. 207, *minuta*, Somerset, Australia, p. 208, *metallica*, New Guinea, p. 209, *nigroviridis*, Amboina, *viridana*, p. 211, and *viridipennis*, New Guinea, p. 212, Jacoby, *t. c.*; *R. atrata*, Macleay, P. Linn. Soc. N. S. W. ix. p. 709, Macleay Coast, New Guinea.

Euryope hæmatica, Gerstaecker, JB. Hamb. Anst. i. p. 62, Massai.

Abirus flavopilosus, p. 15, *violaceus*, p. 16, and *subrugosus*, p. 204, Jacoby, Notes Leyd. Mus. vi., Sumatra.

Typophorus simplex, Rio Janeiro, p. clvi., *fulvipennis*, *nigripennis*, Colombia, *atomarius*, Bahia, p. cciii., and *pygmaeus*, Brazil, p. cciv., Lefèvre, *t. c.*

Stethotes basalis, p. 231, *hirtipes* and *nigroviridis*, p. 232, Jacoby, Ann. Mus. Genov. xx., New Guinea.

Corynodes angulicollis, p. 22, *balyi*, p. 23, and *basalis*, p. 205, *id.* Notes Leyd. Mus. vi., Sumatra.

Thyra maculigera, Lefèvre, *t. c.* p. cciv., Brazil.

Chrysochus singularis, *id. t. c.* p. ccv., Pekin; *C. hageni*, Jacoby, *t. c.* p. 206, Sumatra.

Biorus variatus, Lefèvre, *t. c.* p. ccv., Amazons.

Colaspoides glabrata, *nigripes*, *apicicornis*, *nigricornis*, and *sumatrensis*, Jacoby, *t. c.* pp. 17-21, Sumatra.

Chrysomelides.

FAIRMAIRE, L. Liste complémentaire des espèces du G. *Timarcha*. An. Soc. Esp. xiii. pp. 75-112.

78 species (6 new) belonging to the European and Mediterranean Fauna described. The following synonymy occurs:—*T. piochardi*, Fairm. (= *brulerii*, Fairm.), *hispanica*, Herr.-Schäff. (= *rugipennis*, Arcas), *rugosa*, Linn. (= *scabra*, Oliv., and *generosa*, Erichs.), *lavigata*, Linn. (= *punctata*, Leach, and *punctella*, Mars.), *pimelioides*, Herr.-Schäff. (= *amethystipes*, Chev.), *nicensis*, Villa (= *italica*, Herr.-Schäff.), *tenebricosa*, Linn. (= *unicolor*, Herbst, and *græca*, Müll., varr. *angusticollis*, Géné, M.S., *intermedia*, Herr.-Schäff. (probably = *angollicollis*, subcyanea, and *iberica*, Motsch.), and *semipolita*, Chev.), *sardea*, Villa (= *pruneri*, Herr.-Schäff., and *sublavis*, Fairm.), *coriaria*, Fabr. (= *goettingensis*, Payk., *violaceonigra*, De Geer, and *tenebricosa*, Herbst), *rugulosa*, Herr.-Schäff. (= *lomnicki*, Mill.), *chloropus*, Germ. (= *gallæciana*, Chev.), *lusitanica*, Illig. (= *scortea*, Germ., and *occidentalis*, Herr.-Schäff.), and *hummeli*, Fald. (? = *armeniaca*, Fald.).

MARSEUL, S. A. DE. Monographie des Chrysomélides (suite). L'Ab. xx. pp. 73-108.

Extends from *Timarcha* to end.

Phædon cochlearia, Fabr., noticed, with table of allied species; Letzner, JB. schles. Ges. lxi. pp. 311-313: it is destructive to mustard in Essex; Fitch, Ent. xvii. p. 212.

known from that country being *Plagioder a fusclosa*, Stål, notie 6 (= *convexicollis*, C. W., nec Boh., described; Horn, Canad. Ent. xvi. pp. 127 & 128).

Melasoma cupreum, Fabr.: varieties noticed; rein, Z. n. ver. schles. (2) ix. pp. xxii. & xxiii. *M. populi*, Linn., and *tremulæ*, Fabr.: larvæ described; Kittel, CR. Ver. Regensb. xxxiii. pp. 30 & 31.

Chrysomela cœrulans, Scriba, *marginalis*, Duft., and *fastuosa*, Linn.: life-histories; Letzner, JB. nass. Ver. xxxvi. pp. 93-100. *C. distincta*, Küst., probably = *marcasitica*, Germ.; *C. graminicola*, Drap. & Duftschm., resembles *Phædon pyritosus*, Rossi: Kraatz, Deutsche E. Z. xxviii. p. 156. *C. scalaris* and *labyrinthica*, Lec., discussed; Hill & Caulfield, Canad. Ent. xvi. pp. 120, 126, & 127.

Chalcographa scalaris, Lec., discussed; Hagen, Canad. Ent. xvi. pp. 225 & 226.

Orina. Species grouped by scaling of elytra; Stierlin, MT. schw. ent. Ges. vii. p. 7.

Calligrapha scalaris, Lec., *opifera*, *pnirsa*, Stål (= *labyrinthica*, Lec., MS.), and *limbaticollis*, Stål, noticed; Horn, t. c. pp. 127 & 128.

Doryphora decemlineata, Say; continued spread in N. America; W. Saunders, Canad. Ent. xvi. p. 207; scarcity in autumn of 1882 and 1883; Claypole, P. Am. Ass. xxxii. pp. 320 & 321. *D. (Leptinotursa) melanothorax*, Stål, noticed from New Mexico; Horn, t. c. p. 128.

Timarcha metallica, Laich., var. noticed; Letzner, t. c. p. 308.

Allocharis marginata, Sharp. Larva described; Purdie, N. Z. J. S. ii. p. 166.

Entomoscelis adonidis, Fall. Extraordinary abundance in Hungary in May, 1867, when they stopped a train; Tömösvary, Rov. Lapok, i. pp. 43, and vi.

Chalcolampa 18-guttata, Fabr., slight variety from Sumatra noticed; Jacoby, Notes Leyd. Mus. vi. p. 27.

Phytodecta (Goniocœna) rufipes, De Geer. Larva and pupa described; Letzner, t. c. pp. 308-311.

Phratora vulgatissima, Linn., destructive to willows in Cheshire; Ent. xvii. p. 239.

New genera and species:—

Xenomela, Weise, Deutsche E. Z. xxviii. p. 226. Allied to *Timarcha* and *Cyrtanastes*; mentum small, very short, prothorax not margined at the base, antennæ subfiliform, 3 first joints of tarsi equal. Type, *X. kraatzii*, sp. n., t. c. p. 327, Osch.

Chetocera, id. Ins. Deutschl. Col. vi. p. 514. Section of *Phyllodecta*; antennal joints 4-6 with long hair; prothorax slightly margined at the base. To include *Chrysomela vulgatissima*, Linn., and *Ph. (Chat.) inhonesta*, sp. n., t. c., note, Kiachta, Sarepta (?).

Sclerophædon, id. t. c. p. 534. Allied to *Phædon*. Type, *Chrysomela carniolica*, Germ.

Phædon segnis (= *pyritosa*, Duft., nec Rossi, and *hederæ*, Kraatz, nec Suffr.) and var. *obscurus*, Alps, Carpathians, p. 540, and *fausti*, Ochotsk, p. 540, note, Weise, Ins. Deutschl. Col. vi.

Præcoccis oblongiuscula, Fairmaire, C.R. ent. Belg. xxviii. p. lxiv., Batna.

Adalia notata, Laich., var. *quinquepunctata*, p. cxxv., E. Africa.
 Frivaldszky, Term. füzetek, viii. p. 8. (see E. Z. xxviii. p. 164), Aranjuez,
~~*hyrcana*, Baly, *notata* Linn., p. 388, note, and *syriaca*, Syria, p. 408, note,~~
 Weise, t. c.; *C. milleri*, Croatia, Carniola, and *reitteri*, Caucasus, id.
 Deutsche E. Z. xxviii. pp. 162 & 163; *C. immarginata*, Rybakow, Hor.
 Ent. Ross. xviii. p. 135, Kulja, &c.; *C. sumatrensis*, Jacoby, Notes
 Leyd. Mus. vi. p. 25, Sumatra.

Timarcha nevadensis, p. 81, *sobrina*, p. 85, *transversicollis*, p. 87, *catalaunensis*, p. 100, *perezii* (= *hispanica*, Arcas, nec Herr.-Schäff.), p. 103, and *semilævis*, p. 105, Fairmaire, An. Soc. Esp. xiii., Spain.

Cyrtanastes weisei, Reitter, Deutsche E. Z. xxviii. p. 121, Corfu.

Cyrtionus ehlersi, *arcasi*, and *heydeni*, Fairmaire, Deutsche E. Z. xxviii. p. 361, Spain.

Chalcolampra violaceipennis, Jacoby, t. c. p. 26, Sumatra.

Stethomela marginata, id. t. c. p. 7, Aru.

Australica unicolor, id. t. c. p. 8, Timor.

Goniocena akbesiana, Fairmaire. Ann. Soc. Ent. Fr. (6) iv. p. 175, Akbès.

Paropsis schlegelii, Salawatti, p. 93, *chapuisi*, Sumbawa, p. 95, 20-pustulata, Aru, p. 96, and *sumatrensis*, Sumatra, p. 98, Duvivier, Notes Leyd. Mus. vi.

Halticoides.

JACOBY, M. Biologia Centrali-Americana. [Vide Godman & Salvin: Insecta, General Subject.] Coleoptera, vi. (1) pp. 265-336, pls. xvi.-xix.

Includes *Halticidæ*, from *Diphaulaca* to *Systema*. The following known species are figured or specially noticed:—*Diphaulaca jucunda*, Har., fig. 2, *columbica*, Har., *Lactica scutellaris*, Oliv. (= *Haltica ambulans*, Suffr., and *Strabala hamatina*, Dej. Cat.), fig. 6, pl. xvi., *dives*, Har., *violaceipennis*, Dej. (= *tibialis*, Baly), *binotata*, Baly, pl. xvii. fig. 3, *Plectotetra clarki*, Baly (= *Diphaulaca rugipennis*, Sturm), pl. xvi. figs. 24 & 25, *Phrynocephala pulchella*, Baly (= *Romalocera forticornis*, Dej., fig. 24, *deyrollei*, Baly, *Haltica patruelis*, Sturm, fig. 11, *jamaiceensis*, Fabr. (= *Galeruca plebeja*, Oliv., *Graptodera tursata*, Sturm, and *bassiae*, Fabr.), *amethystina*, fig. 12, pl. xvii., and *bimarginata*, Say (= *Haltica ambiens* and *prasina*, Lec., *Graptodera carinata*, Sturm, and *plicipennis*, Mannerh.), *brevis*, Har., fig. 19, *complicata*, Har., fig. 10, *obliterata* and *torquata*, Lec., *Syphrea pretiosa*, fig. 23, *Cucoscelis compta*, Erichs., fig. 18, pl. xvii., *quinquelineata*, Latr., fig. 5, *flava*, Clark, fig. 4, *Disonychia collata*, Fabr., *dorsata*, Har., fig. 11, *trifasciata*, Clark, figs. 14 & 15, *austriaca*, Schauf., fig. 18, *glabrata*, Fabr. (= *Altica alternata*, Latr., and *Crioceris tomentosa*, Fabr.), *alternata*, Ill. (= *fumata* var., *plurigata*, and *pura*, Lec., and *5-rivata*, Say), *crenicollis*, Say, fig. 22, pl. xviii., *abbreviata*, Melsh., fig. 3, *Caporis subcostata*, Clark, fig. 10, pl. xix., *Pelonia elongatula*, Baly, pls. xvii. fig. 25, & xix. fig. 7, *Prasona viridis*, Baly, fig. 13, *Systema oberthueri*, fig. 15, *elongata*, Fabr. (?), *chloropus*, Har., fig. 14, pl. xix., *ustulata*, Har., pl. xx. figs. 17 & 18, *S-littera*, Linn. (= *sinuatovittata*, Clark), *discicollis*, fig. 5, and *pectoralis*, Clark.

known from that country being *Lan-*
Haltica oleracea, Linn., and *Pic. 6* (= *convexicollis*, C. W., nec Boh.,
described; Kittel, CB. Ver. Regensburg, 1851, *Notes* Leyd.

Nisotra gemella, Erichs., noticed from Sumatra; Jacoby, *Notes* Leyd.
Mus. vi. p. 31.

Orestia, Germ. Its proper position is near *Crepidodera* (*Halticines*);
Reitter, Wien. ent. Z. iii. pp. 243 & 244.

Altica (*Psylloides*) *hyoscyami*, Linn., discussed, with reference to its
food-plant (*Hyoscyamus niger*, Linn.); Savard, Bull. Insect. Agric. ix.
pp. 45-53.

Graptodera chalybea, Ill., noticed; W. Saunders, Canad. Ent. xvi.
pp. 207 & 208.

Lactina subcostata, Jac., var. (?) from Rio Janeiro noticed; Duvivier,
C.R. ent. Belg. xxviii. p. clvii.

Longitarsus echii, Koch. Life-history; Buddeberg, JB. nass. Ver.
xxxvii. pp. 103-105.

Phyllotreta vulgarissima, Linn. (= *cærulescens*, Küst.). Structure
noticed; Kraatz, Deutsche E. Z. xxviii. p. 156.

Sebaethe lusca, Fabr., discussed; Jacoby, t. c. p. 32.

Edionychis fairmairei, Har., = *Galeruca decorata*, Blanch.; Berg,
Bull. Soc. Ent. Fr. (6) iv. p. c.

Hyphasis wallacei, Baly. Slight variety from Sumatra noticed;
Jacoby, t. c. p. 29.

New genera and species:—

Aphanocera, Jacoby, Biol. Centr. Am. Col. vi. (1) p. 320. Placed after
Pelonina, but with some resemblance to *Cucoscelis*. Type, *A. fulveola*,
sp. n., *ibid.* pl. xix. fig. 11, Panama.

Megasus, *id.* t. c. p. 321. Resembles *Lactica*, but antennæ very long
and slender, thoracic groove sinuate, not limited at the sides by a longi-
tudinal fovea, but interrupted at some distance from the lateral margin,
each end being directed obliquely upwards. Type, *M. bimaculatus*,
sp. n., *ibid.* pl. xix. fig. 12, Guatemala.

Imolia, *id.* Notes Leyd. Mus. vi. p. 32. Differs from *Spharometopa*
by the closed anterior coxal cavities. Type, *I. nigrofasciata*, sp. n., *ibid.*,
Sumatra.

Cerotrus, *id.* t. c. p. 33. An aberrant form of *Halticinae*. Type, *C.*
melanocephalus, sp. n., t. c. p. 34, Sumatra.

Anicera, *id.* t. c. p. 207. Intermediate between *Chaloenus* and *Oxygona*;
but second and third joints very short. Type, *A. bimaculata*, sp. n., t. c.
p. 208, Sumatra, Java.

Homelea, *id.* t. c. p. 211. *Halticinae*, but a transitional form to *Galeru-*
cinae; shape of *Apocrypta*, but palpi filiform, and hind femora very
slightly incrassate. Type, *H. variabilis*, sp. n., t. c. p. 212, Sumatra.

Priostomus, *id.* S. E. Z. xlv. p. 185. Differs from *Febr*a by the simple
and unarmed tibiae. Type, *P. unicostatus*, sp. n., *ibid.*, Java.

Notozona guatemalensis, Duvivier, C.R. ent. Belg. xxviii. p. cccxii.,
Guatemala.

Acrocrypta fulvicollis, Jacoby, Notes Leyd. Mus. vi. p. 30, Sumatra.

Podagricra rufa, Allard, Wien. ent. Z. iii. p. 248, Morocco.

Adalia notata, Laich., var. *quinquefuzetek*, viii. p. 7, Asia Minor. Friyaldszky, Term. fuzetek, viii. p. 8. *cecana*, fig. 20, pl. xvii., both from Mexico. ~~*undulata* Linn. p. 18, figs. 16-21, Mexico, Costa Rica,~~ Panama, Guatemala, p. 323, *nigroplagiata*, figs. 23 & 24, Mexico, p. 324, *contigua*, fig. 25, Mexico, Guatemala, *undulata*, fig. 22, pl. xix., Mexico, *apicicornis*, fig. 1, Panama, p. 325, *posticata*, fig. 2, Mexico, *championi*, fig. 11, Guatemala, p. 326, *dilatipennis*, fig. 12, Panama, *metullica*, fig. 13, Guatemala, p. 328, *viridipennis*, fig. 3, Mexico, *regularis*, fig. 14, Panama, p. 329, *cozalis*, fig. 19, Guatemala, *longicornis*, fig. 16, Guatemala, *scutellaris*, Mexico, p. 330, *brunneoovittata*, fig. 15, Guatemala, *subcostata*, Mexico, p. 332, *subrugosa*, Mexico, *thoracica*, fig. 4, Mexico, Guatemala, p. 333, *puncticollis*, *bohemani*, fig. 7, p. 334, *semiovittata*, fig. 9, Mexico, *salvini*, fig. 8, Guatemala, *palmeri*, Mexico, p. 335, *capitata*, fig. 6, Mexico, *laticollis*, fig. 10, pl. xx. p. 336, Jacoby, Biol. Centr. Am. Col. vi.

Haltica mexicana, fig. 13, p. 296, *rugicollis*, *forreri*, Mexico, *guatemalensis*, Guatemala, p. 297, *flavicollis*, Mexico, p. 298, *parvula*, fig. 16, Guatemala, Panama, *minuta*, fig. 17, pl. xvii., Mexico, Panama, p. 299, and *limitata*, Guatemala, p. 300, *id. t. c.*; *H. (Graptodera) elongata*, *id. Notes* Leyd. Mus. vi. p. 28, Sumatra.

Phrynocephala elongata, figs. 1 & 2, Mexico, p. 292, *laevicollis*, fig. 3, pl. xviii., Guatemala, *capitata* and *intermedia*, Mexico, p. 293, *id. Biol. Centr. Am. Col. vi. (1).*

• *Cacoscelis sallæi*, Mexico, and *scriptipennis*, Guatemala, *id. t. c. pp. 303 & 304*, pls. xvii. fig. 14, & xviii. fig. 6.

Pelonia clarki, fig. 9, Guatemala, *balyi*, fig. 8, p. 319, and *seminigra*, fig. 6, Panama, p. 320, *id. t. c. pl. xix.*

Plectrotetra dohrni, p. 284, *submetullica*, fig. 5, Mexico, *regularis*, fig. 6, Guatemala, p. 285, *proxima*, fig. 4, Panama, *monstrosa*, fig. 8, Nicaragua, p. 286, *basulis*, Guatemala, *chiriquensis*, fig. 7, pl. xvii., Panama, p. 287, *guatemalensis*, Guatemala, *sallæi*, p. 288, *flohri*, *inequalis*, Mexico, *nigripes*, Guatemala, p. 289, *rugosa*, Mexico, Guatemala, Panama, and *hirsuta*, Panama, p. 290, *id. t. c.*

Disonycha nigripes, fig. 7, Costa Rica, Panama, p. 305, *melanocephala*, fig. 10, *nigripennis*, fig. 9, Mexico, *mexicana*, fig. 8, Mexico, Guatemala, Nicaragua, p. 306, *subaenea*, fig. 13, *apicalis*, fig. 16, Mexico, p. 307, *sallæi*, fig. 12, Mexico, *pallidicornis*, fig. 17, Panama, p. 308, *nigrita*, Guatemala, *dimidiata*, fig. 21, Panama, p. 309, *sexmaculata*, fig. 19, *cordovana*, fig. 20, Mexico, p. 310, *guatemalensis*, Guatemala, p. 312, *recticollis*, fig. 25, pl. xviii., Mexico, Guatemala, Nicaragua, Costa Rica, *panamensis*, fig. 1, Panama, p. 313, *militaris*, fig. 5, pl. xix., *figurata*, pl. xviii. fig. 24, Mexico, Guatemala, Panama, p. 314, *hægei*, fig. 2, *antennata*, fig. 4, pl. xix., Mexico, p. 315, *capitata*, Mexico, Guatemala, p. 316, *brunneofasciata*, British Honduras, and *brevilineata*, pl. xviii. fig. 23, Mexico, p. 317, *id. t. c.*; *D. pulchra*, Pennsylvania, p. 51, *arizonæ*, Arizona, p. 52, and *procera*, Delaware, p. 182, Casey, Col. N. Am.

Lactica bifasciata, fig. 3, Panama, *nigromaculata*, fig. 12, Guatemala, p. 270, *variabilis*, figs. 17 & 18, Mexico, Guatemala, Panama, *chevrolati*, fig. 16, Mexico, p. 271, *chiriquiensis* [sic], fig. 14, *uniformis*, fig. 5, Panama, p. 272, *subcostata*, fig. 13, Mexico, Guatemala, p. 273, *minuta*, fig. 15,

Guatemala, Panama, *mexicana*, known from that country being *Lan-*
fig. 8, Mexico, *lecontei*, Panama, p. 6 (= *convexicollis*, C. W., nec Boh.,
semiviolaceus, Mexico, p. 276, antennæ p. 277, *clongata*, Mexico,
fig. 4, Panama, *anepennis*, fig. 20, Guatemala, Panama, p. 277, *viridipennis*, fig. 9, Guatemala,
violacea, fig. 23, Guatemala, Panama, p. 278, *obscura*, Nicaragua,
abdominalis, fig. 10, pl. xvi., British Honduras, p. 279, *cupreata*, fig. 2, Mexico,
Panama, *salvini*, Guatemala, p. 280, *pusilla*, Mexico, *chontalensis*, fig. 22, Nicaragua,
godmani, fig. 1, pl. xvii., Panama, p. 281, *germari*, pl. xvii. fig. 9, Guatemala,
ornata, fig. 19, pl. xvi., Mexico, p. 284, *germari*, pl. xvii. fig. 9, Guatemala,
and *frontalis*, Guatemala, Costa Rica, p. 283, Jacoby, t. c.; *L. sumatrensis*,
id. Notes Leyd. Mus. vi. p. 27, Sumatra.

Diphauluca nitida, Mexico, British Honduras, Guatemala, Costa Rica,
p. 265, *panamensis*, *chiriquensis*, pl. xvi. fig. 1, Panama, p. 266, *scrbrina*,
Mexico, *crassicornis*, Guatemala, Panama, p. 267, *brevicollis*, *quadraticollis*,
Panama, p. 268, and *irazuensis*, Costa Rica, p. 269, id. Biol. Centr. Am.
Col. vi. (1).

Lactina fromonti, Duvivier, t. c. p. clvi., Rio Janeiro.

Aphthona sumatrana, Jacoby, Notes Leyd. Mus. vi. p. 206, Sumatra;
A. reitteri, Allard, t. c. p. 248, Caucasus.

Batophila græca, id. *ibid.*, Greece.

Plectroscelis delarouzei, Brisout, Rev. d'Ent. iii. p. 89, Syria, Algeria.

Phyllotreta basialis, id. t. c. p. 90, Algeria.

Sebaethe sumatrana and *affinis*, Jacoby, t. c. pp. 208 & 209, Sumatra.

Eucycla varipes, id. t. c. p. 210, Sumatra.

Chaetocnema paupercula, Casey, t. c. p. 53, Long Island.

Cedionychis angusticollis, Duvivier, t. c. p. clvii., Rio Janeiro.

Hyphasis parvula, Jacoby, t. c. p. 29, Sumatra.

Sphaeroderma (?) *striatipennis*, p. 35, *levipennis* and *S. (?) geminata*,
p. 36, id. t. c., Sumatra.

Psylliodes balyi, id. t. c. p. 30, Sumatra; *P. extricata*, New Jersey, and
ænescens, Long Island, Casey, t. c. pp. 54 & 55.

Galerucides.

Jacoby, Notes Leyd. Mus. vi., notices and sometimes redescibes the
following species:—*Oides pectoralis*, Clark, *Aulacophora rosea*, Fabr. (? =
dimidiata, Guér.), *atripennis* and *luteicornis*, Fabr., *marginata*, Chap. (?),
palliat, Schall. (= *orientalis*, Herbst), and *coffea*, Hornst., pp. 37–41,
A. cornuta, Baly, 6-punctata, Oliv. (?), *A. sp.*, *Macrima abdominalis*,
Antipha seminigra, Jac., var., pp. 221 & 222, *Miltina dilatata*, Chap., var.,
p. 42, *Haplononyx speciosus*, Baly, and *sumatrae*, Fabr., p. 49, *H. sexpla-*
giatus, Baly (= *javana*, Wiedem.), belongs to *Sphenoraiia*, p. 72, *Monolepta*
bifasciata, Fabr., and *basimarginata*, Boisd. (?), pp. 53 & 54, *Neocharis*
fulvicollis, Jac., and *Xenoda spinicornis*, Baly, pp. 56–58.

Adimonia tanacet, Linn., *pomona*, Scop., *Trirrhada viburni*, Payk.,
and *Galerucella xanthomelena*, Schrank. Larvæ described or noticed;
Kittel, CB. Ver. Regensb. xxxiii. pp. 57–59.

Aulacophora || *flavescens*, || *viridipennis*, || *limbata*, and || *nigripennis*.
Chap., renamed *chapuisi*, *smaragdipennis*, *cinctipennis*, and *philippinensis*,
respectively; *Malacosoma flavivent*, Baly (nec *Calomicrus flaviventris*,

Adalia notata, Laich., var. *quinqueviridis*, Phil., noticed : Duvivier, Frivaldszky, Term. füzetek, viii. p. 8. ccxiv.

~~*Adalia punctata* Linn.~~ *lambertsi*, Jac. (?), and *marginoguttata*, Blanch., noticed; *antennalis*, Duviv., nec Baly, renamed *antennata* : id. Notes Leyd. Mus. vi. pp. 236 & 237.

Diabrotica longicornis, Say. Life-history and ravages, &c.; Forbes, Rep. Ins. Illin. xii. pp. 10-31, figs. 1-5, and xiii. pp. 55 & 56, pl. v. figs. 1-5.

Galerucella lineata, Fabr., injurious to osier-beds (Oseraies) in France; Lucas, Bull. Soc. Ent. Fr. (6) iii. p. cxxiii.

Galeruca xanthomelæna, Schrank. Transformations and ravages noticed; Clarkson, Canad. Ent. xvi. pp. 124 & 125. Destructive to elms in New Jersey; Lockwood, Bull. Dep. Agric. Ent. iv. p. 90.

Agelasa halensis, Linn. Life-history; Buddeberg, JB. nass. Ver. xxxvii. pp. 101-103.

Enidea armata, Baly, varr. from Askold and the Amur noticed; Von Heyden, Deutsche E. Z. xxviii. p. 300.

New genera and species :—

Pseudaplosomyx, Duvivier, C.R. ent. Belg. xxviii. p. cccxvi. Allied to *Aplosomyx*; elytra pubescent. Type, *P. ceruleipennis*, sp. n., t. c. p. cccxvii.

Strobiderus, Jacoby, Notes Leyd. Mus. vi. p. 61. *Monoleptinae*; elytra punctate-striate and pubescent, the apex produced into a flattened protuberance and preceded by a deep inward excavation in ♂. Type, *S. excavatus*, sp. n., t. c. p. 62, Sumatra.

Glyptolus, id. t. c. p. 62. *Scelidinae*. Type, *G. viridis*, sp. n., t. c. p. 63, Sumatra.

Sermylroides, id. t. c. p. 64. Allied to *Malacotheria* and *Macrima*, but penultimate joint of palpi incrassate. Type, *S. basalis*, sp. n., t. c. p. 65, Sumatra.

Delocephala, id. t. c. p. 66. Placed after *Galerucella*; ♂ with head broader than thorax, and anterior legs elongate. Type, *D. apicicornis*, sp. n., t. c. p. 67, Sumatra.

Sumatrasia, id. t. c. p. 67. *Mimastrinae*; elytra punctate-striate, and thorax subquadrate. Type, *S. unicolor*, sp. n., t. c. p. 68, Sumatra.

Pseudocophora, id. t. c. p. 69. Allied to *Aulacophora*, but elytral epipleura continued nearly to the apex. Type, *A. buqueti*, Guér. (re-described, *ibid.*); add *P. uniplagiata*, sp. n., t. c. p. 214, Sumatra.

Sastroides, id. t. c. p. 218. Allied to *Sastra*; palpi stout, thorax more transverse, and general shape convex and dilated. Types, *S. bimaculata* and *unicolor*, spp. nn., pp. 218 & 219, Sumatra.

Neolepta, id. t. c. p. 222. Allied to *Monolepta* and *Candezea*; antennæ with intermediate joints dilated, and 2nd and 3rd joints very short. Types, *N. fulvipennis* and *biplagiata*, spp. nn., t. c. pp. 222 & 223, Sumatra.

Coeligetes, id. t. c. p. 227. *Platyxanthinae*; thorax transverse, narrow, and without depressions on the upper surface. Type, *C. submetallica*, sp. n., t. c. p. 228, Serdang, Sumatra.

Adalia notata, Laich., var. *quinquepunctata*, Frivaldszky, Term. füzetek, viii. p. 8. *Adalia*, Java, Borneo, p. 234, and

Ochræa marginata, Linn., p. 55, Sumatra.

Eustetha variabilis, id. t. c. p. 224, Sumatra.

Theopea obliterated, id. t. c. p. 56, Sumatra.

Xenarthra elodice, Fairmaire, Bull. Soc. Ent. Fr. (6) iii. p. cxxxiii., Senegal.

Platyxantha basalis, Manilla, and *rubripennis*, Borneo, Duvivier, t. c. pp. cccxviii. & cccxix.; *P. (?) nigripennis*, Jacoby, t. c. p. 225, Sumatra.

Metrioidea apicalis, id. t. c. p. 226, Sumatra.

Ænidea sumatrensis, id. t. c. p. 229, Sumatra.

Doridea (?) smaragdina, Duvivier, t. c. p. cccxx., Sarawak.

Hispides.

Ozycephala speciosa, Boisd. Larva and pupa described; Lucas, Bull. Soc. Ent. Fr. (6) iii. p. lxxxii., & iv. pp. v. & vi.

Hispa algeriana, Guér., = *testacea*, Linn., var.: Leprieur, Bull. Soc. Ent. Fr. (6) iii. p. lxxxi. *H. gestroi*, Chap., = *chapuisii*, Gestro, noticed; Ann. Mus. Genov. xx. pp. 305 & 306.

Erionispa badeni, Chap. [Vide *Cerambycides*, anteâ, p. 104.]

Hispa caroli, sp. n., Leprieur, Bull. Soc. Ent. Fr. (6) iii. p. lxxxi., Bône (? = *cariosa*, Reiche, var.).

Cassidides.

Porphyraspis tristis, Boh. Larva described and figured; Olliff, Tr. E. Soc. 1884, pp. 435-437. Habits of larva; Sharp, P. E. Soc. 1884, p. xviii.

Physonota unipunctata, Say. Variation, &c., noticed; Hamilton & Caulfield, Canad. Ent. xvi. pp. 134-136, 226, & 227.

Cassida. Larva described; Kittel, CB. Ver. Regensb. xxxiii. pp. 85 & 86. *Cassida* sp. from Askold noticed; Von Heyden, Deutsche E. Z. xxviii. p. 285.

Cassida brevis, Weise, Deutsche E. Z. xxviii. p. 159, Amasia; *C. exsanguis* and *tetraptera*, Gerstaecker, JB. Hamb. Anst. i. pp. 62 & 63, Massai: spp. nn.

Charidotis serpululata, sp. n., Donckier, CR. ent. Belg. xxviii. p. cliv., Bahia.

Coptocycla testacea, sp. n., Rybakow, Hor. Ent. Ross. xviii. p. 136, woodcut, Vladivostok.

LANGURIIDÆ.

LEWIS, G. Japanese *Languriidæ*, with Notes on their Habits and External Sexual Structure. J. L. S. Zool. xvii. pp. 347-361, pl. xiv.

This paper commences with observations on the geographical distribution, habits, and affinities of the family, which the author regards as "a, comparatively speaking, recent type of *Coleoptera*, nearer to the *Chrysomelidæ* than to the *Erotylidæ*." 5 species are described as new

from Japan, those previously known from that country being *Languria pectoralis*, C. Waterh., fig. 6 (= *convexicollis*, C. W., *nec* Boh., *nec* Horn, *sodalis*, C. W., and *waterhousei*, Crotch), *nigritarsis*, C. W. (? = *unicolor*, Motsch.), *lewisii*, Crotch, figs. 7 (& 8, femur), *geniculata*, Har., *atriceps*, Crotch, *ruficeps*, Crotch, figs. 10 (& 11, antenna), *prætermissa*, Jans., *filiformis*, Fabr. (= *nigripes*, Crotch), *præusta*, Crotch, and *Microlanguria jansoni*, Crotch. The paper concludes with observations on the sexual and tarsal characters of the insects.

Doubledaya (White, recharacterized) *bucculenta*, sp. n., Lewis, t. c. p. 355, pl. xiv. figs. 1-3, Japan.

Languria ingens, figs. 4 (& 5, tibia), p. 356, *nara*, *columella*, fig. 9, p. 357, and *fucosa*, fig. 12 (& 13, antenna), p. 358, spp. nn., *id.* t. c., Japan.

EROTYLIDÆ.

Helota lævigata and *pusilla*, Oberthür, redescribed (both figured in Waterhouse, Aid. iii. pl. cxliv. figs. 1 & 2). A list of the species of *Helota* is added; and the following synonymy is given:—*H. gemmata*, Gorb. (= *bowringi*, Dohrn, MS.), *thibetana*, Westw. (= *mellyi*, Westw.), and *guerini*, Hope (= *ocellata*, Rits., and *curvipes*, Oberth.) (cf. also Ritsema, Notes Leyd. Mus. vi. p. 134): Olliff, Cist. Ent. iii. pp. 100 & 101.

Orestia, Germ. [Vide *Halticoides*.]

Helota scintillans, Olliff, Cist. Ent. iii. p. 99, Java (?); *H. africana*, *id.* Ann. N. H. (5) xiii. p. 479, Angola: spp. nn.

Triplax valida, sp. n., Reitter, Verh. Ver. Brünn, xxii. p. 5, Hamarat.

Tritoma ancora and *infulata*, spp. nn., *id.* t. c. p. 6, Lirik, &c.

Aulacochilus humeralis, sp. n., Waterhouse, Ann. N. H. (5) xiii. p. 372, Philippines.

ENDOMYCHIDÆ.

Hybopterus plagiaticollis, Fairmaire. Genus and species recharacterized by him; S. E. Z. xlv. p. 141.

Lycoperdina. Table of species allied to *L. bovistæ*, Fabr.; Reitter, Deutsche E. Z. xxviii. pp. 60 & 61.

Dapsa opuntia, sp. n., Reitter, Deutsche E. Z. xxviii. p. 117, Corfu.

Lycoperdina pulvinata, Dalmatia, Greece, pp. 59 & 61, *subpubescens*, Corsica, p. 60, and *maritima*, Alpes Maritimes, p. 61, spp. nn., Reitter, Deutsche E. Z. xxviii.

COCCINELLIDÆ.

Popular remarks on *Coccinellidæ*, with figures of many N. American species; W. Saunders, Rep. Fruit-Growers' Ass. Ont. 1882, pp. 280 & 281, figs. 27-34.

Harmonia picta, Rand. (fig. 24), and *Chilocorus bivulnerus*, Muls. (fig. 25, larva), noticed as destructive to the "woolly bark-louse of the pine"; W. Saunders, Rep. E. Soc. Ont. 1883, p. 86, and Rep. Fruit-Growers' Ass. Ont. 1883, p. 326.

Adalia notata, Laich., var. *quinque-signata* from Brussa described; Frivaldszky, Term. füzetek, viii. p. 8.

Coccinella bipunctata, Linn., &c.: large swarm; François, Feuille. Nat. xiv. p. 147. *C. bipunctata*, ♂ pairing with *variabilis*, Ill., ♀; Douglas, Ent. M. M. xxi. p. 19. *C. decempunctata*, Linn., varr. *bimaculosa*, Herbst, and *12-punctata*, Müll., taken in coitū; Cornelius, JB. Ver. Elberfeld, vi. p. 56. *C. dispar*, Schneid.: notes on modes of protection, cannibalism, &c.; Slater, J. Sci. (3) vi. pp. 597-599. *C. lyncea*, Oliv., var. *asiatica* (? = *marmottani*, Fairm.) from Palestine and Amasia described; Weise, Deutsche E. Z. xxviii. p. 160. *C. septempunctata*, Linn.: larva described; Kittel, CB. Ver. Regensb. xxxiii. p. 92.

Ithone (Aiolocaria) hexaspilota, Hope, var. *nigra* from Dauria described; De Kerville, Ann. Soc. Ent. Fr. (6) iv. p. 70.

Micraspis sedecimpunctata, Linn., var. *letzneri* from Breslau described; Schneider, Z. E. Ver. schles. (2) ix. p. xxx.

Exochomus pubescens, Küst. (= *flavilabris*, Motsch.), and var. *gestroi*, Fairm. (= *apicatus*, Fairm.): variation, &c., discussed; Bedel, Bull. Soc. Ent. Fr. (6) iv. pp. xxxiv. & xxxv. *E. nigropictus*, Fairmaire: variation noticed by him; C.R. ent. Belg. xxviii. p. lxx. *E. punctulatus*, Linn.: life-history; Buddeberg, JB. nass. Ver. xxxvii. pp. 105 & 106.

Pharus bardus, Muls., var. *anchorago* from Biskra described; Fairmaire, t. c. p. lxx.

* *Epilachna* sp. noticed; * Gadeau de Kerville, Mél. ent. ii. pp. 6 & 7.

Subcoccinella vigintiquatuor-punctata, Linn. Destruction of lucerne by its larvæ; Kittel, t. c. p. 99.

New species:—

Adonia (♀) *nigrodorsata*, Fairmaire, Ann. Soc. Ent. Fr. iii. p. 505, Patagonia.

Coccinella limbicollis, id. t. c. p. 506, Patagonia.

Cyrtocaria mocquerysi, De Kerville, Ann. Soc. Ent. Fr. (6) iv. p. 69, pl. iv. fig. 6, Madagascar.

Neda bourgeoisi, id. t. c. p. 70, pl. iv. fig. 7, Australia.

Chilocorus australasiae, id. t. c. p. 71, pl. iv. fig. 8, Australia.

Orcus quadrimaculatus, id. t. c. p. 72, pl. iv. fig. 9, Australia.

Exochomus apicatus, Fairmaire, C.R. ent. Belg. xxviii. p. lxx., Biskra.

Brumus fulviventris, id. t. c. p. cxlix., Zanzibar.

Scymnus zig-zag, Costa, Bull. Ent. Ital. xv. p. 332, Sardinia; *S. sumatrensis*, bilunularis, p. 126, and *brunneus*, p. 127, Gorham, Notes Leyd. Mus. vi., Sumatra; *S. (Pullus) abeillei*, Weise, Deutsche E. Z. xxviii. p. 165, S. France.

Pharus berytensis, id. t. c. p. 166, Beyrout.

Lithophilus latus, Haifa, and *marginatus*, Beyrout; Reitter, Deutsche E. Z. xxviii. pp. 251 & 252.

CORYLOPHIDÆ.

Moronillus pumilus, sp. n., Reitter, Deutsche E. Z. xxviii. p. 117, Corfu.
Sacium damryi, sp. n., id. t. c. p. 58, Morea.

HYMENOPTERA.

BY

W. F. KIRBY, F.E.S., &c.

THE GENERAL SUBJECT.

ADOLPH, E. Zur Morphologie der Hymenopterenflügel. Zugleich ein Beitrag zu den Fragen der Speciesbildung und des Atavismus. Nova Acta Ac. L.-C. Nat. cur. xlv. pp. 43-132, pls. i.-vi.

The normal and aberrant neururation of many *Hymenoptera* is fully discussed, and amply figured, while the results of the examination of nearly 2000 individuals of various varieties of *Apis* are tabulated. The author regards the *Siricidae* as the most primitive of all *Hymenoptera* in the structure of their wings. On the first plate, wings of *Baetis* and *Ephemera* are placed beside those of various *Hymenoptera*, for comparison.

AMANS, —. Étude de l'organe du vol chez les Hyménoptères. Rev. Montp. (3) iii. pp. 485-522, pls. i. & ii.

Contains an elaborate description of the structure and action of the wing and the adjacent parts in *Sirex gigas* and *Xylocopa violacea*. The wing of *Sirex* is intermediate in structure between that of the *Orthoptera* and of *Xylocopa*. Too little attention has been paid by previous authors to the parts at the base of the wing, which Amans regards as of great importance.

ANDRÉ, E. Species des Hyménoptères d'Europe et d'Algérie. 20me-23me Fasc. (ii. pp. 549-831, pls. xxi.-xxxiii. & xxxvii. and exp. pls. xxiv.-xlvi.).

Pls. xxi.-xxv. relate to ants, and the rest of the part of the work published in 1884 to *Vespidae*, containing the conclusion of the introduction, the bibliography, and the special part.

CAMERON, P. Biologia Centrali-Americana. [Vide Goddard & Salvin: INSECTA, General Subject.] *Hymenoptera*, pp. 81-144, pls. v.-vii. Extends from *Smicra* to *Ichneumon*.

GRIBODO, G. Viaggio al Assab nel Mar Rosso dei signori G. Doria ed O. Beccari con il R. Avviso "Esploratore dal 16 Novembre 1879 al 26 Febraio 1880." III. Imenotteri. Ann. Mus. Genov. xx. pp. 381-392.

[GRIBODO, G.] Spedizione Italiana nell' Africa equatoriale. Risultati zoologici.—Imenotteri. Memoria seconda. *Op. cit.* (2) i. pp. 277-325.

— Sopra alcuni Imenotteri raccolti a Minhla nel regno di Birmania da G. B. Comotto. *T. c.* pp. 349-368.

These three papers respectively include 27, 73, and 34 species of *Hymenoptera Aculeata*, many new. Various known species are also discussed.

HEYDEN, L. v. Beiträge zur Kenntniss der Hymenopteren-Fauna der weiteren Umgegend von Frankfurt-a.-M. *Ber. senck. Ges.* 1883 & 1884, pp. 103-125.

115 species of *Chalcididae* and *Fossores* are recorded, and a comparison is made with the number of species occurring in several other parts of North and Central Germany.

KIRBY, W. F. On the *Hymenoptera* collected during the recent expedition of H.M.S. 'Challenger.' *Ann. N. H.* (5) xiii. pp. 402-413.

51 species noticed, 11 new.

KOHL, F. F. Neue Hymenopteren in den Sammlungen des k. k. zoolog. Hof-Cabinetes zu Wien. ii. *Verh. z.-b. Wied.* xxxiii. pp. 331-386, pls. xvii. A & xviii.

Several new genera as well as species are described. The figures represent details only.

MAGRETTI, P. Nota d'Imenotteri raccolti dal F. Piccioli nei dintorni di Firenze, colla descrizione di alcune nuove specie e di un genere nuovo. *Bull. Ent. Ital.* xvi. pp. 97-122, pl. ii.

158 species enumerated.

— Risultati di raccolte imenotterologiche nell' Africa orientale. *Ann. Mus. Genov.* (2) i. pp. 523-636, pl. i. & map.

190 species enumerated, many new.

SAUNDERS, E. Further notes on the terminal segments of *Aculeate Hymenoptera*. *Tr. E. Soc.* 1884, pp. 251-267, pl. xiii.

Relates chiefly to the 7th and 8th ventral segments, and the genital armature. The 8th ventral segment is always distinctly present in the *Aculeata*. The writer considers the male characters of the *Aculeata* of more importance to their classification than is the neurulation.

Supposed organs of hearing (or glands ?) in *Hymenoptera*; Forel, *M.T. schw. ent. Ges.* viii. p. 4.

Bees and wasps destroying apricots, &c.; Sheppard, *Gard. Chron.* (2) xxii. p. 248.

Hymenopterous parasites are probably guided to their prey by sight rather than by smell, and appear only able to attack hairy larvæ under favourable circumstances; Clarkson, *Canad. Ent.* xvi. pp. 53 & 54.

Various Hymenopterous parasites on *Coccidae* noticed and figured; Goethe, *J.B. nass. Ver.* xxxvii. pp. 128 & 129, pl. iii. figs. 52-67.

List of *Hymenoptera* parasitic on *Lepidoptera*; Fitch, *Ent.* xvii. pp. 67-69.

145 parasites obtained from a pupa of *Vanessa antiopa*, and 1257 from an unknown larva; Harriet H. Keyes, Canad. Ent. xv. p. 237.

List of 26 Hymenopterous parasites on *Lithocolletis endriella*, Mann.; Mina Palumbo, Nat. Sicil. vii. p. 19.

Contributions to the Bibliography of *Hymenoptera*; Dalla Torre, Naturhistoriker, vi. pp. 48-50 & 421-424.

List of Aculeate *Hymenoptera* of the neighbourhood of Colchester; Harwood, Ent. M. M. xx. pp. 211-213.

Captures of do. at Chobham, and of *Ichneumonidæ* at various localities; Billups, P. E. Soc. 1884, pp. xxxii. & xxxiii.

Captures of *Tenthredinidæ* and *Ichneumonidæ* near York in 1882 and 1883; Wilson, Naturalist (2) x. pp. 115-117.

Notes on the *Hymenoptera* of Siebenbürgen; Mocsáry, Term. füzetek, viii. pp. 185, 186, & 218-226.

Excursion to the Balearic Islands, with notes on *Hymenoptera* observed; Schmiedeknecht, Z. E. Ver. schles. (2) ix. pp. 7-14.

Note on do. of Labrador; Packard, Ent. xviii. p. 1267.

Notes on 81 species of do. collected near Victoria, Vancouver Island, in 1882; Taylor, Canad. Ent. xvi. pp. 77-80 & 90-92.

Kirby's list of the *Hymenoptera* of New Zealand reprinted, with descriptions added of all species not included in Hutton's last Catalogue; N. Z. J. Sci. ii. pp. 65-77.

Mutilla sp. and a small yellow ant destroying larvæ of *Papilio cressphontes*, Cram.; Neal, Bull. Dep. Agric. Ent. iv. p. 87.

APIDÆ.

BELLEVOYE, A. Observations sur le *Chalicodoma muraria*, le *Megachilus centuncularis*, et l'*Osmia bicornis* aux environs de Metz. Bull. Soc. Metz (2) xvi. pp. 113-131.

Relates to nidification, &c.

BRIANT, T. J. On the Anatomy and Functions of the Tongue of the Honey-Bee (Worker). J. L. S. xvii. pp. 408-417, pls. xviii. & xix.

After describing the endo-skeleton and the structure of the tongue, and discussing the opinions of previous authors relative to the functions of the tongue, the writer concludes that "the honey is drawn into the mouth through the inside of the tongue by means of a complicated pumping action of the tongue itself and its closely contiguous parts, and not in any sense by lapping."

CARLET, G. Sur les muscles de l'abdomen de l'Abeille. C.R. xxviii. pp. 758 & 759.

These muscles may be divided into those of the *dorsal*, *lateral*, and *ventral* regions. The dorsal include the aliform and the inner and outer dorsal muscles, which latter are expiratory. The lateral muscles include the outer and inner oblique, which are expiratory, and the transverse muscles, which are inspiratory. The ventral muscles include the inner and outer ventrals, which are expiratory, and the interventrals, which

are inspiratory. It follows, therefore, that, with the exception of the aliform muscles, which assist in circulation, all the abdominal muscles aid in respiration, and consequently in sustaining the heat of the body.

[CARLET, G.] Sur le venin des Hyménoptères, et ses organes sécréteurs. *T. c.* pp. 1550 & 1551 ; Bull. Soc. Ent. Fr. (6) iv. pp. cviii.-cx.

—. Sur une nouvelle pièce de l'aiguillon des Mellifères, et sur le mécanisme de l'expulsion du venin. *C.R.* xcix. p. 206.

Carlet has continued his researches on the venom of *Hymenoptera*, and the structure of the sting and poison-glands. He finds that the venom is always acid, although formed by the mixture of two fluids, one strongly acid, and the other feebly alkaline. These are secreted by separate glands, which discharge their contents at the base of the sheath of the sting. In bees, the poison-bag is not retractile, but in addition to the stylets, there is an accessory organ at their base resembling a piston, which pumps the venom through the syringe-like canal by which it is discharged into the wound.

CHOŁODKOWSKY, N. Über den Hummelfachen und seine Bedeutung für die Systematik. *Zool. Anz.* vii. pp. 312-316.

The structure of the sting in *Bombus* resembles that of *Apis*; and the author describes it with special reference to the detailed account of the latter by Kraepelin. It differs somewhat in different species of *Bombus*, and may prove a useful aid in their determination.

DALLA TORRE, C. G. DE. Bibliologia Schenckiana. *Rev. mens. Ent.* i. pp. 147-242.

Includes a list of Schenck's publications on *Apidae*, and a critical list of all the species noticed by him. (Extends to *Halictus*.)

GRAESI, B. Intorno allo sviluppo delle api nell' uovo. *Atti Soc. Ital.* xxvi. pp. 355-370.

Detailed observations on the changes which take place during the development of the egg of the bee.

* HARRIS, W. H. The Honey Bee: its Nature, Homes, and Products. London: 1884. (*Cf.* Wallace, *Nature*, xxxi. pp. 1 & 2.)

HOCKINGS, H. J. Notes on Two Australian Species of *Trigona*. *Tr. E. Soc.* 1884, pp. 149-157.

Relates to the habits, &c., of *Trigona carbonaria*, Smith, and an undetermined species called "Kurbi," or "Keelar," and "Kootchar," by the natives. Their principal enemies are small birds, *Achræa grisella*, Hübn. (a moth), and *Protetia mandarina*, Web. (a beetle).

HOFFER, E. Alte und neue Beobachtungen über das Familienleben der Hummeln. *MT. Ver. Steirn.* 1883, pp. lvii.-lxi.

—. Einige bisher unbekannte oder wenig bekannte Hummelnester. *Kosmos*, xiv. pp. 114-119.

KING, A. J. Bee-keeping [in America]. *Encycl. Am.* i. pp. 477-482, woodcuts.

1884. [VOL. XXI.]

* KRANCHER, O. Die dreierlei Bienenwesen und ihre Vereinigung zum Bienenstaate. Leipzig: 1884, 8vo, pp. iv. & 45, figs.

KRISTOF, L. "Eigene Beobachtungen über das Leben einheimischer Hummeln"; verbunden mit einer Besprechung der darüber von E. Hoffer im 31 und 32 Jahres-Berichte der steierm. Landes Ober-realschule (1882-1883), veröffentlichten Monographie. MT. Ver. Steierm. 1883, pp. lxiv.-lxxiv.

MÜLLER, H. Ein Beitrag zur Lebensgeschichte der *Dasygaster hirtipes*. Verh. Ver. Rheinl. xli. pp. 1-52, pls. i. & ii.

An elaborate paper, treating of the preparation of the burrow, and the behaviour of the ♀ if that is destroyed; parasitism of a species of *Milto-gramma* (*Muscidae*); provision for the brood; development from egg to pupa; pupation, and emergence of the perfect bee, &c.; and a list of papers consulted.

PÉREZ, J. Contribution à la Faune des Apiaries de France. 2^{me} partie: Parasites. Act. Soc. L. Bord. xxxvii. pp. 205-380, pls. xiii. & xiv. (details).

In the commencement of this paper, the structure and affinities of the various genera are discussed in detail, with the following results:—*Psithyrus* appears to be an offshoot from a *Bombus* allied to *B. lefebvrei*; *Stelis* is an isolated form, apparently an offshoot of *Anthidium*; *Calioxys*, *Dioxys*, *Nomada*, and allies are similarly related to *Megachile*; and *Sphecodes* is nearly related to *Halictus*. In the second part, many species are discussed at length, with reference to their variation, &c., and several new species are described. The following known species are noticed:—*Psithyrus rupestris*, Fabr., and var. *vasco*, Lep., *campestris*, Panz., var., *n-flavus*, *Psithyrus barbutellus*, Kirb., and var. *lugubris*, Kriechb., *quadricolor*, Lep. (= *globosus*, Eversm.), and var. *lissonurus*, Thoms., *Calioxys atra*, Lep. (= *coronata*, Först.), *marginata*, *hæmorrhæa*, Först., *octodentata*, Lep. (differentiated from *erythropyga*, Först.), *polycentrus*, Först. (♀ = *conspersa*, Mor.), *acanthura*, Eversm. (= *macrura*, Först.), *færsteri*, Mor., *argentea*, Lep. (= *diplotenia* and *constricta*, Först.), *aurolimbata*, Först., *rufescens*, Lep., *conica*, L. (= *quadridentata*, L.), *elongata*, Lep. (= *simpler*, Nyl.), *vectis*, Curt. (= *punctata*, Lep., and *conoidea*, Klug), *Dioxys cincta*, Jur., and var. *pyrenaica*, Lep., *tridentata*, Nyl., *Melecta armata*, Panz. (cum varr. *grandis*, *nigra*, *bipunctata*, *testaceipes*, and *aterrima*, Lep.), *luctuosa*, Scop. (= *punctata*, Lep.), *plurinotata*, Brullé, *Crocisa histrio*, Latr., *orbata* and *ramosa*, Lep., *major*, Mor., *Epeolus tristis*, Smith, *fallax*, Mor. (♀ described), *productus*, Thoms., *rufipes*, Thoms. (= *variegatus*, Linn.), *Nomada pectoralis*, Mor., *mammi*, Mor. (= *mauritanica*, Lep., var.), *erythrocephala*, Mor. (= *helvetica* and *blepharipes*, Schmied.), *tripunctata*, Mor. (= *flavomaculata*, Lep., *zonata*, Lep. (nec Panz.), renamed *lepeletieri*, p. 322, *pusilla*, Lep., *lath-buriana*, Kirb. (= *consobrina*, Duf.), *zonata*, Panz., *rhenana*, Mor. (♂ described), *solidaginis*, Panz., *errans*, Lep., *nobilis*, Herr.-Schäff., and var. *magrettiana*, Schmied.), *jacobææ*, Panz. (= *serica*, Duf.; but *jacobææ*, Lep., = *lineola*, Panz.), *emarginata*, Mor. (♂ described), *fulvicornis*, Lep. (= *frey-gessneri*, Schmied.), *schmiedeknechti*, Mocs., *mutica*, Mor. (= *cincta*,

Lep.), *signata*, Jur. (*ruficornis*, Linn., cum varr. *mirabilis*, *phænicea*, Schmied., *proteus* and *panzeri*, Lep., and *flava* ♂, Lep.; *flava*, ♀, Lep., = *lineola*, Panz.), *glabella*, Thoms., *ochrostoma*, Kirb., *dallatorreana*, Schmied. (♂ = *olympica*, Schmied.), *discrepans*, Schmied., var. (?), *furva*, Panz. (= *minuta*, Fabr.), *distinguenda*, Mor., *kohli*, Schmied., *armata*, Herr.-Schäff. (cum varr. *rostrata*, *compta*, and *lanceolata*, Lep.), *eos*, *corcyraa*, Schmied., *ferruginata*, Kirb., and *brevicornis*, Mocs.

RADOSZKOWSKY; O. Révision des armures copulatrices des males du genre *Bombus*. Bull. Mosc. lix. (1) pp. 51-92, pl. i.-iv.

The genital armature of the males of *Bombus* is composed of four principal parts :—

- I. The *penis*, which is fleshy, obtuse at the extremity, and covered by a hard semi-transparent plate (*spatha*).
- II. Two *sagittæ*, horny projections rising on each side of the penis.
- III. Two forceps or *hamuli*, consisting of three portions: the *stipa*, which forms the base of the forceps, the scale (*squama*) above the upper portion of the stipa, and the *lacinia*, or terminal segment.
- IV. The *operculum genitale*, composed of two overlapping parts which cover the genital armature beneath.

In addition to these four principal parts, there is the basal portion, or *cardo*.

The author then divides the species of *Bombus* into 11 groups, according to the variations in the form of the genital armature. His remarks on various species are not confined to this special subject; and he describes several as new.

SAUNDERS, E. Synopsis of British *Hymenoptera*. *Anthophila*; part ii. *Apidæ*. Tr. E. Soc. 1884, pp. 159-250, pls. v.-xiii.

Includes a monograph of the species from *Panurgus* to *Apis* inclusive. The plates represent details. No new species are described.

— Revision of the British species of *Sphecodes*, Latr. (including 9 additional) (commencement). Ent. M. M. xxi. pp. 148-151.

STROUD, J. W. The Honey Bee (*Apis mellifica*): its natural history and management. Tr. East. Prov. (S. Afr.) Nat. Soc. i. pp. 1-66.

Parts 8-10 of Schmiedeknecht's "*Apidæ Europææ*" have appeared within the year, containing the completion of *Andrena* (pp. 583-866, or *Andr.* and index, pp. 169-452) and of vol. i., which includes *Nomada*, *Bombus*, *Psithyrus*, and *Andrena*, with title page, &c., and the commencement of *Osmia* (vol. ii. pp. 869-898, or *Osm.* pp. 1-32). *Andrena*, from 43 to 186; and *Campylogaster*, 3 species are described; *Osmia* is subdivided into 13 subgenera, mostly new, including 88 species; but only a small part of the table of species has yet appeared.

E. A. Butler has published a semi-popular article on wild bees, relative to structure, habits, parasites, &c.; Knowledge, v. pp. 52-54, 99, 100, & 124-126, woodcuts.

Hawksbury sandstone perforated by a bee (?) in Blue Mountains; Norton; P. Linn. Soc. N. S. W. ix. p. 681.

Captures of *Andrenide* and *Apidæ* at Rugby; Morice, Rep. Rugby School Soc. 1883, p. 49.

List of bees observed at Hermannstadt in 1883; Henrich, Verh. siebenb. Ver. xxxiv. p. 136.

Relations between bees and flowers: Gard. Chron. (2) xxi. pp. 456, 489, 522, & 586; J. Sci. (3) vi. pp. 561-563; Bull. Soc. Acclim. (4) i. p. 770. Bees visiting broad beans; Grant Allen, Knowledge, vi. p. 376. Effect of dahlias on bees; Gard. Chron. (2) xxii. pp. 470 & 501.

Andrenides.

Sphecodes, genital armature, *Halictus lavis*, Kirb., *Andrena angustior*, Kirb., and *polita*, Smith, noticed; E. Saunders, Ent. M. M. xx. p. 272.

Prosopis scutata, Licht., = *polita*, Smith; *Sphecodes perversus*, Rits., = *scabricollis* (Wesm.), Sich.; and *Halictus convexus*, Schenck, = *prasinus*, Smith; Ritsema, Notes Leyd. Mus. vi. p. 200.

Colletes. Coleopterous parasites noticed: Beauregard, C.R. xcix. pp. 148-151; Lichtenstein & Pérez, Bull. Soc. Ent. Fr. (6) iv. pp. xxviii. & xliii.

Halictus brevicornis, Schenck, is not a British species; the insect described by Saunders under that name = *breviceps*, Saund., ♀; E. Saunders, Ent. M. M. xx. p. 229.

Nomioides pulchella, Schenck, noticed; Dittrich, Z. E. Ver. schles. (2) ix. p. xxxi.

Andrena. List of Silesian species; *id. t. c.* p. xxxv. *A. schmiedeknechti*, Magr., figs. 4 & 4a, p. 110, and *florentina*, Magr., figs. 5 & 5a-c, p. 113, redescribed and figured; Magretti, Bull. Ent. Ital. xvi. pl. ii. *A. rutila*, Spin., redescribed and variation noticed: Gribodo, Ann. Mus. Genov. xx. pp. 382 & 383.

Nomia magretti, Gribodo, Bull. Ent. Ital. xvi. p. 270, Egypt, Abyssinia; *N. quartina*, *id.* Ann. Mus. Genov. (2) i. p. 285, Shoa (leg figured); *N. patellata*, Magretti, Ann. Mus. Genov. (2) i. p. 621, pl. i. figs. 15 a, b (legs), Soudan, Abyssinia: spp. nn.

Hyleus plumicornis and *strigulosus*, spp. nn., Costa, Rend. Acc. Nap. xxiii. p. 169, Sardinia.

Andrena symphyti (Pérez, MS.), p. 583 (*Andr.*, p. 169), *rufula* (Pérez, MS.), Bordeaux, p. 592 (*Andr.*, p. 178), *julliani*, S. France, Spain, Balearic Islands, p. 596 (*Andr.*, p. 182), *mitis* (Pérez, MS.), Bordeaux, p. 605 (*Andr.*, p. 191), *hystrix*, Hungary, S. France, p. 618 (*Andr.*, p. 204), *lombardica*, Lombardy, p. 674 (*Andr.*, p. 260), *gengvensis*, Switzerland, Hungary, p. 693 (*Andr.*, p. 279), *radoszkowskyi* (= *fasciata*, Rud. nec Wesm.), Caucasus, p. 694 (*Andr.*, p. 280), *pulcherrima*, Italy, Spain, p. 697 (*Andr.*, p. 283), *magrettiana*, Lombardy, p. 699 (*Andr.*, p. 285; cf. also Magretti, Bull. Ent. Ital. xvi. p. 112, pl. ii. figs. 4 & 4a), *deceptor*, S. France, p. 745 (*Andr.*, p. 331), *separanda*, Thuringia, p. 780 (*Andr.*, p. 366), *mocsaryi*, Hungary, p. 782 (*Andr.*, p. 368), *congruens*, Thuringia, p. 787 (*Andr.*, p. 373), *hypopolia* (Pérez, MS.), S. Europe, p. 802 (*Andr.*, p. 388), *dissidens*, S. Europe, p. 806 (*Andr.*,

p. 392), *korbi*, Spain, p. 825 (*Andr.*, p. 411), and *orenburgensis* (= *compta*, *Pall.*, MS., nec *Lep.*), Orenburg, p. 831 (*Andr.*, p. 417), Schmiedeknecht, *Ap. Eur. i.*; *A. suerinensis*, Friese, *Ent. Nachr.* x. p. 308, Germany, France : spp. nn.

Ctenoplectra antinorii, sp. n., Gribodo, *Ann. Mus. Genov.* (2) i. p. 284, Shoa.

Apides.

Xylocopa acraensis, Fabr., *æstuans*, Linn., var. *rubida*, *flavorufa*, De Geer (= *trepida*, Fabr.), *carinata* and *oblonga*, Smith, *divisa*, Klug, *inconstans*, Smith, *Megachile antinorii*, Grib., *maxillosa*, Guér., *ianthoptera*, Smith, and *Celioxys caudata*, Spin. (♂ described), noticed by Gribodo from Shoa; *Ann. Mus. Genov.* (2) i. pp. 278-284.

Xylocopa dissimilis, Lep., *hottentota*, Smith, *Megachile disjuncta*, *lanata*, Fabr., var. *minhlensis*, *Parevaspis abdominalis*, Smith, and *Celioxys decipiens*, Spin. (= *apicula*, Smith), noticed from Burmah; *id. t. c.* pp. 350-354.

Ammobates tacinus, Gerst., is parasitic upon *Tetralonia ruficornis*. Fabr.; Mocsáry, *Rev. Lapok*, i. pp. 20, 21, & iv.

Nomada guttulata, Schenck, *Megachile ericetorum*, Lep. (= *pyrina*, Smith, nec *Lep.*), *Heriades truncorum*, Linn., and *Bombus nivalis*, Dahlb., noticed; E. Saunders, *Ent. M. M.* xx. p. 272.

On the nidification of solitary bees, with figures of the nests of *Megachile lagopoda*, Linn. (?), *willughbiella*, Kirb., *pacifica*, Panz., and *Osmia bidentata*, Mor. (= *affinis*, Friv.); Mocsáry, *Rev. Lapok*, i. pp. 181-184 & xxiv., figs. 39 & 40.

Anthidium. List of Palæarctic species (99); Mocsáry, *Term. füzetek*, viii. pp. 241-278. The following known species are redescribed, in addition to several new ones:—*A. bartholomæi*, Rad., *diadema*, Latr., *tenellum* and *nanum*, Mocs., and *pubescens*, Mor.

Nomada. List of Silesian species; Dittrich, *Z. E. Ver. schles.* (2) ix. pp. xxix. & xxx. *N. piccioliana*, Magretti, redescribed and figured by him; *Bull. Ent. Ital.* xvi. p. 117, pl. ii. figs. 6 & 6a-c.

Stelis ruficornis, Morawitz. Both sexes fully described by him; *Hor. Ent. Ross.* xviii. pp. 137-140.

Celioxys elongata, Lep., bred from a cocoon on thistle; Bignell, *Ent.* xvii. p. 190, and *Ent. M. M.* xxi. p. 68.

Osmia bicolor, Schrank. Habits; Perkins, *Ent. M. M.* xxi. pp. 38, 67, & 68.

Chalicodoma muraria. Habits, &c., discussed; Kunckel d'Herculais, *Bull. Insect. Agric.* ix. pp. 39-42, fig. 3.

Megachile albocincta, Rad., noticed from Kassala; Magretti, *Ann. Mus. Genov.* (2) i. p. 624. *M. genalis*, Mor.: nidification, &c., described; Dudich, *Rev. Lapok*, i. pp. 241-246, xxix., & xxx., fig. 46. *M. lagopoda*, Linn., destroying the leaves of oaks; &c., introduced from America; Sajó, *Rev. Lapok*, i. pp. 210, 211, & xxvii., 232, 233, & xxix. *M. lanata*, Fabr., and *opposita*, Smith, noticed, and ♂ of the latter described; Gribodo, *Bull. Ent. Ital.* xvi. p. 271.

Anthophora. List of 11 species (2 new) from Krasnovodsk; *A.*

asiatica, Mor., and *saussurei*, Fedtsch., are redescribed; Morawitz, Rev. mens. Ent. i. pp. 123-128. *A. fulva*, Eversm., ♂ described; Radoszkowsky, Hor. Ent. Ross. xviii. p. 25. *A. parietina*, Fabr., and its parasite, *Sitaris muralis*, noticed; Fokker & Everts, Tijdschr. Ent. xxvii. pp. lxxxvii.-lxxxix.

Xylocopa violacea, Linn., perforating the nectary of flowers to obtain the honey; Bertkau, Verh. Ver. Rheinl. xli. pp. 350-352. *X. aruana*, Rits., = *Apis bryorum*, Fabr.; Ritsema, Notes Leyd. Mus. vi. p. 200.

Bombus. Morawitz replies to Radoszkowsky's criticisms [*cf.* Zool. Rec. xx. p. 127]; Bull. Mosc. lviii. (3) pp. 23-35. Not constant in visiting flowers; Weed, Am. Nat. xviii. p. 936. Attempted introduction into New Zealand; P. E. Soc. 1884, p. iii. *B. pennsylvanicus*, De Geer, appropriating wren's, martin's, and mouse's nests; Osborn, Kellicott & Murtfeldt, Rep. E. Soc. Ont. 1883, p. 19. *B. senex*, Voll., = *rufipes*, Lep., var.; Ritsema, Notes Leyd. Mus. vi. p. 200. *B. smithianus*, White, noticed in Unst; Briggs, Ent. xvii. p. 200 and note. *B. terrestris*, Linn.: hibernation of ♀; Guinchard, Ent. Tidskr. v. pp. 190 & 227.

Melipona. Difficulties of rearing; Armand, Bull. Soc. Acclim. (4) i. pp. 751 & 752. Nest, &c., noticed; Jones, Naturalist (2) ix. p. 129. Bee-keeping in Guatemala; Stoll, MT. schw. ent. Ges. vii. p. 5.

Apis. Darwinistic relations of the various species and races; Ent. Nachr. x. pp. 229-233. Bee-keeping in India; Wallace, Nature, xxxi. pp. 1 & 2. *A. mellifica*, Linn., apparently destitute of hearing; Forel, MT. schw. ent. Ges. vii. p. 6: instincts of neuters; Campbell, Tr. Hertf. Soc. iii. pp. 127 & 128: bees stupefied with cold when out of the hive in cold weather; Bull. Soc. L. Brux. iii. pp. 36-38: Müllenhoff's theory of the origin of bee-cells; Dewitz, B. E. Z. xxviii. p. 346: the formic acid present in honey is derived from the poison of the bee; Karsch, Ent. Nachr. x. pp. 195 & 196.

New genera and species :—

Osmia. Schmiedeknecht, Ap. Eur. ii., divides this genus into 13 subgenera, mostly new:—*Ceratosmia*, Thoms. (*bicornis*, L., &c.), *Aceratosmia*, n. (*emarginata*, Lep., and *macroglossa*, Gerst.), *Melanosmia*, n. (*fuciformis*, Latr., & allies), p. 885 (*Osm.* p. 19), *Chalcosmia*, n. (*anea*, Linn., &c), *Erythrosomia*, n. (*andrenoides*, Spin., and *melanura*, Mor.), *Acanthosmia*, Thoms. (*rufohirta*, Lep.), p. 886, (*Osm.* p. 20), *Arctosmia*, n. (*villosa*, Schenk), *Otenosmia*, Thoms. (*adunca*, Latr., &c.), *Tridentosmia*, n. (*tridentata*, Duf. & Perr., &c.), p. 887 (*Osm.* p. 21), *Helicosmia*, Thoms. (*aurulenta*, Panz., &c.), *Furcosmia*, n. (*papaveris*, Latr., &c.), p. 888 (*Osm.* p. 22), *Megalosmia*, n. (*grandis* and *princeps*, Mor.), and *Hoplosmia*, Thoms. (*spinulosa*, Kirby, &c.), p. 889 (*Osm.* p. 23).

|| *Macroglossa*, Radoszkowsky, Hor. Ent. Ross. xviii. p. 17, pl. i. figs. 1b & c (details). Affinities not stated. Type, *M. oribazi*, sp. n., t. c. p. 18, Oribaza, Mexico.

|| *Epeicharis*, id. t. c. p. 18, pl. i. figs. 2a-e (details). Affinities not stated. Type, *E. mexicanus*, sp. n., t. c. p. 19, Oribaza.

Epicharoides, Radoszkowsky, t. c. p. 20, pl. i. figs. 3a-e (details). Allied to last. Type, *E. bipunctatus*, sp. n., *ibid.*, Mexico.

Euthyglyssa, *id.* t. c. p. 21, pl. i. figs. 4a-c (details). Affinities not stated. Type, *E. fasciata*, sp. n., t. c. p. 22, Oribaza.

Allodupe ambigua, Algoa Bay, and *ceratinoides*, Port Elizabeth, Gribodo, Bull. Ent. Ital. xvi. p. 269.

Nomada leucosticta, Bordeaux, Sicily, p. 337, *platyzona*, Algeria, S. France (?), p. 343, *hirtipes*, S.W. France, p. 329, *maculicornis*, S. France, p. 352, *diluta*, France, p. 354, *quadridens*, Bordeaux, p. 358, *discedens*, S. France, p. 361, *connectens*, S. France, Sicily, p. 364, *calomeria*, S. France, p. 367, *morawitzi*, Pyrenees, *serriicornis*, Marseilles, p. 370, *rubiginosa*, S.W. France, p. 372, *cyphognatha*, S.W. France, Sicily, p. 374, and *amblystoma*, Villeneuve-sur-Lot, p. 376, Pérez, Act. Soc. L. Bord. xxxvii.

Epeolus collaris, Algeria, p. 315, *intermedius*, Marseilles, p. 316, *julliani*, S. France, p. 318, and *præustus*, Basses-Pyrénées, p. 324, *id.* t. c.

Stelis murina, *id.* t. c. p. 272, S. Europe, Algeria; *S. leucostoma*, Costa, Bull. Ent. Ital. xv. p. 336, Sardinia.

Celioxys coturnix, S. France, Spain, p. 278, *obtusa*, S. France, p. 279, *antennalis*, Bône, p. 282, and *patula*, Central Europe (?), p. 297, Pérez, t. c.; *C. montandoni*, Gribodo, t. c. p. 272, figs. (terminal segments), Celebes.

Diorys spinigera, S. Europe, Algeria, *rotundata*, Marseilles (?) and Spain, Pérez, t. c. pp. 299 & 300; *D. mæsta*, Costa, t. c. p. 336, Sardinia.

Megachile schmiedeknechtii, *id.* Rend. Acc. Nap. xxiii. p. 169, Sardinia; *M. quartine*, Gribodo, Ann. Mus. Genov. (2) i. p. 352, Burmah.

Anthidium dalmaticum, Dalmatia, p. 251, *excisum*, Granada, p. 254, *paradoxum*, p. 256, *acuminatum*, Brussa, p. 257, *reticulatum*, Spain, p. 260, *andrei*, Algeria, p. 268, and *barbatum*, Budapest, p. 274, Mocsáry, Term. füzetek, viii.; *A. melanostomum* and *peregrinum*, Costa, t. c. p. 170; *A. rufispinum*, *id.* Bull. Ent. Ital. xv. p. 336, Sardinia; *A. christophi*, Morawitz, Hor. Ent. Ross. xviii. p. 66, Achal-Tekke.

Crocisa tricuspis, Algeria, and *truncata*, S. France, Pérez, t. c. p. 312; *C. quartine*, Gribodo, Bull. Ent. Ital. xvi. p. 272, Celebes.

Osmia giraudi, Schmiedeknecht, Ap. Eur. ii. p. 896 (*Osm.* p. 30), locality not stated; *O. atriventris*, Costa, Bull. Ent. Ital. xv. p. 335; *O. (Chalcosmia) laterefasciata*, *id.* Rend. Acc. Nap. xxiii. p. 169, Sardinia.

Anthophora procera, *id.* Bull. Ent. Ital. xv. p. 336, Sardinia; *A. peter-seni* and *Angipes*, Morawitz, Rev. mens. Ent. i. pp. 124 & 127, Krasnovodsk; *A. perplexa*, Orenburg, p. 23, *mlkosewitszii*, Caucasus, p. 24, *rugosa*, Demavend, p. 25, Radoszkowsky, Hor. Ent. Ross. xviii.

Bombus insipidus, Caucasus, p. 75, *äumoucheli*, Irkutsk & Nertchinsk, p. 78, *thoracicus*, S. America, p. 79, *renardi*, Corsica, p. 81, and *perplexus* Caucasus, p. 83, *id.* Bull. Mosc. lix. (1).

Xylocopa scioensis, Gribodo, Ann. Mus. Genov. (2) i. p. 279, Shoa.

Psithyrus distinctus, Pérez, *t. c.* p. 268, Europe.

Trigona gribodoi, Magretti, *Ann. Mus. Genov.* (2) i. p. 632, E. Africa.

VESPIDÆ.

Polistes marginalis, Fabr. (= *ornata*, Lep., and *plebeia*, Gerst.), *smithii*, Sauss., *Belenogaster menelikii*, Grib., *junceus*, Oliv. (= *Vespa guineensis* and *cinerea*, Fabr.), *Odynerus synagroides*, Sauss., *Rygghium laterale*, Fabr. (= *V. africana*, Fabr.), *Synagris combusta*, *xanthura*, and *æthiopica*, *Eumenes lepeletieri* and *fenestralis*, Sauss., *tinctor*, Christ (= *savignyi*, Guér.), *concinna*, Sauss., and *acuminata*, Sauss. (♀ described), noticed from Shoa; Gribodo, *Ann. Mus. Genov.* (2) i. pp. 286-297.

Vespa doryloides, Sauss., *cincta* and *affinis*, Fabr., *Icaria marginata*, Lep., *ferruginea*, *Eumenes petiolota*, *esuriens*, *conica*, and *Rygghium brunneum*, Fabr., noticed from Burmah; *id. t. c.* pp. 354-357.

Icaria xanthura, Sauss. (?), *Raphiglossa symmorpha*, Sauss., *Eumenes tinctor*, Christ, *concinna*, *lepeletieri*, *Synagris xanthura*, Sauss., *Rygghium laterale*, Fabr., ♂, *Odynerus chloroticus*, Spin., *magrettii*, Grib., *solstitialis*, Sauss., and other species noticed from the Eastern Soudan; Magretti, *Ann. Mus. Genov.* (2) i. pp. 606-621.

Characters of *Ischnogaster* and allied genera tabulated; *id. t. c.* p. 605.

Eumenes amedei, St. Farg. (= *dimidiatus*, Brullé): nidification described; Fabre's observations, supposed to relate to this insect, probably refer to *E. coangustatus*, Rossi: Lucas & Lichtenstein, *Bull. Soc. Ent. Fr.* (6) iii. pp. xcvi., xcvi., cv., & cvi). *E. acuminata*, Sauss., noticed; Gribodo, *Bull. Ent. Ital.* xvi. p. 284. *E. fraterna*, Say, noticed and figured, with cell; W. Saunders, *Rep. Fruit-Growers' Ass. Ont.* 1882, p. 281, fig. 35. *E. pomiformis*, Spin. (*Vespa coarctata*, Panz.): note on transformations; Letzner, *J.B. schles. Ges.* lxi. p. 315.

Odynerus reniformis, Gmel., noticed; Billups, *Ent. M. M.* xxi. pp. 68 & 69. *O. basalis*, Smith (= *O. variegatus*, Herr.-Schäff. (*nec* Fabr.)), and *O. (Epipona) herrickii*, Sauss., noticed; Ritsema, *Notes Leyd. Mus.* vi. p. 200.

Polistes rubiginosa, St. Farg., noticed; Nehrling, *Zool. Gart.* xxv. p. 264.

Vespa sp. n. (?), common at Vancouver's Island, noticed; Taylor, *Canad. Ent.* xvi. p. 79. Wasps attacking flies, and the latter trying to rescue their companions; *Nature*, xxx. pp. 385, 407, 408, 480, & 539. Infested by a *Gordius*; Linton, *Feuill. Nat.* xiv. pp. 55 & 56. *V. arborea*, Smith, noticed; E. Saunders, *Ent. M. M.* xx. p. 271. *V. crabro*, Linn., popularly discussed; Humbert & Lesueur, *Bull. Insect. Agric.* ix. pp. 9-12, figs. 1, 2, and pp. 63, 64, & 92-94. *V. holsatica*, Fabr.: pest noticed; Van der Wulp, *Tijdschr. Ent.* xxvii. pp. xvii. & xviii.

New genera and species:—

Quartinia (Gribodo, MS.), André, *Spec. Hym.* ii. pp. 811 & 822, pl. xlv. Allied to *Celonites*; shape longer, and abdomen convex. Type, *Q. dilecta*, (Grib., MS.), sp. n., *t. c.* p. 824, Tunis.

Paramischocyttarus, Magretti, Bull. Ent. Ital. xv. p. 270, and Ann. Mus. Genov. (2) i. p. 600. Allied to *Mischocyttarus*. Type, *P. subtilis*, sp. n., tt. cc. Bull. p. 251, figs. 2a, A & B, and Ann. p. 602, fig., Kassala.

Ischnogasteroides, id. tt. cc. Bull. p. 251, and Ann. p. 603. Allied to *Ischnogaster*, *Belenogaster*, and *Mischocyttarus*. Type, *I. flavus*, sp. n., tt. cc. Bull. p. 252, figs. 3a & A, and Ann. p. 606, Abyssinia.

Ceramius doursii, Algeria, and *caucasicus*, Caucasus, André, Spec. Hym. ii. pp. 818 & 820.

Belenogaster bidentatus, Kirby, Ann. N. H. (5) xiii. p. 410, Fiji.

Eumenes obscurus, France, p. 637, *sareptanus*, Sarepta, p. 638, and *bimaculatus*, S. Europe, p. 645, André, Spec. Hym. ii.; *E. sulcigaster*, Gribodo, Ann. Mus. Genov. (2) i. p. 295, Shoa.

Pterocheilus puniceus (Grib., MS.), Tunis, and *coccineus*, Algeria, André, t. c. pp. 801 & 802.

Odynerus ebussianus, Island of Iriça, and *disconotatus*, Montpellier, Lichtenstein, Bull. Soc. Ent. Fr. (6) iv. p. 1.; *O. lobatus*, Caucasus, Greece, Sicily, p. 667, *sulcatus*, Sicily, p. 673, *saussurei*, Egypt, Abyssinia, p. 682, *disconotatus* (Licht., MS.), Montpellier, p. 683, *morawitzii*, Sarepta, p. 695, *quadrimaculatus*, Sarepta, p. 699, *humeralis*, Tashkend, p. 701, *rubripes*, Orenburg, p. 706, *ornatus*, Tashkend, p. 713, *insularis*, Sicily, p. 718, *orenburgensis*, Orenburg, p. 719, *trinacria*, Sicily, p. 724, *radoschkowskii*, Tashkend, p. 727, *funebri*, E. Siberia, p. 729, *mocsaryi*, Sarepta, p. 741, *rubrosignatus*, p. 742, *stramineus*, Tashkend, p. 745, *hyalinipennis*, Sarepta, p. 746, *rubiginosus*, Caucasus, p. 747, *calabricus*, Calabria, pp. 750 & 768, *destefanii*, Sicily, pp. 752 & 784, *sareptanus*, Sarepta, p. 772, and *hungaricus*, Hungary, p. 777, André, t. c.; *O. quarantina*, Shoa, and *magrettii*, Abyssinia, Gribodo, t. c. p. 290 and note; *O. metemmensis*, Magretti, Ann. Mus. Genov. (2) i. p. 617, Metemma; *O. atlanticus*, Kirby, t. c. p. 409, Cape Verdes.

Rygghium gestroi, Magretti, t. c. p. 614, E. Africa.

Polistes fortunatus, Cape Verdes, and *madoci*, St. Thomas, Kirby, t. c. pp. 410 & 411.

Vespa dybowskii (Radosz., MS.), and *sibirica*, André, t. c. pp. 582 & 599, Siberia; *V. mongolica* and *parallela*, id. Bull. Soc. Ent. Fr. (6) iv. pp. lix. & lxi., Vladivostok.

CRABRONIDÆ.

KOHL, F. F. Die Fossorien der Schweiz. MT. schw. ent. Ges. vi. pp. 649-684.

95 species enumerated.

"Mason-fly," resembling ? gigantic hornet: habits in Victoria; Harrison, Nature, xxx. p. 436.

Bothynostethus, g. n., Kohl, Verh. z.-b. Wien, xxxiii. p. 344, pl. xviii. figs. 5 & 6 (wing and head). Allied to *Nysson*, *Pison*, *Cerceris*, *Harpactes*, and *Tachytes*; the division of the Fossories into subfamilies is inadmissible. Type, *B. saussurei*, sp. n., t. c. p. 346, Mexico.

Pompilides.

KOHL, F. F. Die Gattungen der Pomiliden. *Verh. z.-b. Wien*, xxxiv. pp. 33-58, pl. ii.

15 genera (4 new) are tabulated and described. The plate represents neuration.

Agenia personata, Grib., *Pompilus viaticus*, Linn., *Cyphononyx abyssinica*, Guér., *flavicornis*, Fabr., *subulosa*, *tisiphone*, Smith (= *Mygnumia iridipennis* and *intrepida*, Smith), and *Hemipepsis prodigiosa*, Gerst. (= *contumax*, Gerst.), noticed from Shoa; Gribodo, *Ann. Mus. Genov.* (2) i. pp. 303-313.

Hemipepsis consanguinea, Sauss., and *Pompilus analis*, Fabr., noticed from Burmah; *id. t. c.* pp. 358-361.

Hemipepsis vindex, Smith, *Paracyphononyx paulinieri*, Guér., *Cyphononyx confusus*, Dahlb., *Aporus argyrellus*, Klug, *Pompilus ruficeps*, Eversm., and several other species noticed from E. Africa; Magretti, *Ann. Mus. Genov.* (2) i. pp. 562-576.

Aporus melanurus, Klug, and *Cyphononyx flavicornis*, Fabr., discussed; Gribodo, *Ann. Mus. Genov.* xx. p. 386.

Pompilus pectinipes, Linn., noticed; E. Saunders, *Ent. M. M.* xx. p. 271.

Pepsis dimidiata, Fabr.: hermaphrodite noticed and figured; Moc-sáry, *Rov. Lapok*, i. pp. 54, 55, & vii. fig. 14. *P. elegans*, St. Farg., devoured by a tarantula in Texas; Nehrling, *Zool. Gart.* xxv. p. 263.

New genera and species:—

Pseudagenia (= *Agenia*, Dahlb., nec Schiödt), Kohl, *Verh. z.-b. Wien*, xxxiv. p. 42. Type, *Agenia carbonaria*, Scop.

Sphictostethus, *id. t. c.* p. 47, pl. ii. fig. 4. Type, *Pompilus gravesii*, Hal.

Haploneura, *id. t. c.* pl. ii. fig. 5. Next to last. Type, *H. apogona*, sp. n., *t. c.*, note, Chili.

Pedinaspis, *id. t. c.* p. 55. Subgenus of *Pompilus*. Type, *P. operculatus*, Klug.

Epipompilus, *id. t. c.* p. 57. Allied to *Pompilus*. Types, *E. maximi-liani*, Mexico, and *insularis*, New Zealand, spp. nn., *ibid.*, note.

Paracyphononyx, Gribodo, *Ann. Mus. Genov.* (2) i. p. 306. To include the species of *Pompilus*, auct., with bifid tarsi; also closely allied to *Cyphononyx*, but the tibial armature as in *Pompilus*. Type not stated; *P. melanicerus*, sp. n. (allied to *ruficrus*, Klug), is described at p. 307, from Shoa; add *P. metemmensis*, sp. n., Magretti, *Ann. Mus. Genov.* (2) i. p. 565, Metemma.

Pompilus plicatus, Costa, *Bull. Ent. Ital.* xv. p. 335, Sardinia; *P. antonini*, De Stefani, *Nat. Sicil.* iii. p. 197, Sicily; *P. teterrimus*, Gribodo, *Ann. Mus. Genov.* xx. p. 385, Cairo; *P. contentiosus*, *id. op. cit.* (2) i. p. 305, Shoa.

Priocnemis pogonioides, Costa, *t. c.* p. 335, Sardinia; *P. atlanticus*, Kirby, *Ann. N. H.* (5) xiii. p. 408, Cape Verdes.

Salix elongatus, Doka, and *ruficornis*, Metemma, Magretti, Ann. Mus. Genov. (2) i. pp. 568 & 569.

Ceropales kriechebaumeri, id. t. c. p. 571, Suakin.

Agelia nigro-aurantiaca, id. t. c. p. 575, pl. i. fig. 11, Soudan; *A. quartina* and *valida*, Gribodo, t. c. pp. 303 & 304, Shoa; *A. brownii*, id. Bull. Ent. Ital. xvi. p. 280, New Zealand.

Pepsis collaris, Kirby, t. c. p. 408, Bahía.

Hemipepsis gestroi, Shoa, and *H. (?) sycophanta* (= *flava*, Dahlb., nec Fabr.), Burmah, Gribodo, Ann. Mus. Genov. (2) i. pp. 311 & 359.

Sphegides.

Ammophila ferrugineipes, Jur., *Pelopæus spirifex*, Linn., *spinolæ*, Lep. (= *eckloni*, Dahlb.), *Sphex longiventris*, Sauss., *luteifrons* and *cyanescens*, Radosz., and *Parasphex albisecta*, Lep. (= *trichargyra*, Spin.), noticed from Shoa; Gribodo, Ann. Mus. Genov. (2) i. pp. 297-302.

Pelopæus flavus, Fabr., *violaceus*, Fabr. (= *flexilis*, Lep., and *Chalybion bengalense*, Dahlb.), *Chlorion splendidum*, Fabr. (= *Pronæus campbelli*, Saund., and *Sphex pulchra*, Lep.), and *lobatum*, Fabr., noticed from Burmah; id. t. c. pp. 357 & 358.

Pelopæus spinolæ, Lep., var. *rufopictus*, *Pronæus maxillaris*, Beauv., *instabilis*, and *Ampulex nebulosa*, Smith, and other species noticed from E. Africa; Magretti, Ann. Mus. Genov. (2) i. pp. 576-583.

Chlorion and *Pronæus* differentiated; id. t. c. p. 579.

Pelopæus. Notes on habits; Mocsáry, Rov. Lapok, i. p. 82, 83, & xi.

Pelopæus sp. allied to *lunatus*, Fabr.: contributions to life-history; Sorensen, Ent. Tidskr. v. pp. 13-15. *P. architectus*, St. Farg.: positions of nests; Billups & Kirby, P. E. Soc. 1884, p. xviii. *P. cæruleus*, Linn., noticed; Nehrling, Zool. Gart. xxv. p. 264. *P. nitidiventris*, Spin.: nitidification; Paszlavsky, Rov. Lapok, i. pp. 41, 42, & vi. fig. 10.

Ammophila, Kirby, recharacterized, and the following synonymy given:—*A. robusta*, Cress. [= *A. (Psamm.) communis*, Cress.], *argentifrons*, Cress. [= *A. (P.) mexicana*, Sauss.], and *A. mocsaryi*, Friv. (= *julii*, Fabr.); Kohl, Verh. z.-b. Wien, xxxiii. pp. 376 & 377, & 376, note; *A. striata*, Mocs. (?), is redescribed from Dsungaria; id. t. c. p. 382.

New species:—

Pelopæus quartina, Gribodo, Ann. Mus. Genov. (2) i. p. 298, Shoa; *P. sumatranus*, Kohl, Verh. z.-b. Wien, xxxiii. p. 375, Sumatra.

Ammophila sareptana, p. 378, *longicollis*, pl. xvii. A, fig. 6 (pygidium), Sarepta, p. 379, *fallax*, Syria, p. 380, *dolichoderi*, Prince Albert Land, S. Africa, and *haimatosoma*, Cyprus; p. 383, id. t. c.

Sphex tschenbergi, Magretti, Ann. Mus. Genov. (2) i. p. 581, Metemma.

Enodia vittata, Kohl, t. c. p. 385, Caspian.

Larrides.

Larrada hæmorrhoidalis, Fabr., *funebis*, Radosz. (details, pl. i. figs. 12a, b), *Tachytes basilicus*, Guér. (♂ described), *Notogonia argyropyga*,

Costa, var. *costae*, *Astuta quadripunctata*, Rad., and other species noticed from East Africa; Magretti, Ann. Mus. Genov. (2) i. pp. 583-590.

Larrada and *Tachytes* differentiated; *id. t. c.* p. 584.

Larrada aurulenta, Fabr. (= *Liris aurata*, Fabr., and *Tachytes opulenta*, Lep.), and *subtessellata*, Smith (= *T. maura*, Dahlb.) (amended description), noticed from Burmah; Gribodo, Ann. Mus. Genov. (2) i. pp. 361 & 362.

Tachytes tricolor, Panz. (nec Fabr., = *obsoleta*, Schenck, nec Rossi). renamed *europaea*; Kohl, MT. schw. ent. Ges. vi. p. 671.

Larra, Fabr. (type, *L. ichneumoniformis*, Fabr.), and allied genera tabulated; *id.* Verh. z.-b. Wien, xxxiii. pp. 352 & 353.

Tachysphex panzeri, Van der Lind. (= *oraniensis*, Lep., *ruficentris*, Costa, and probably *tessellata*, Dahlb., *aurifrons*, Luc., and *discolor*, Friv.). redescribed, with 8 varieties; *id. t. c.* pp. 368-371.

Miscophus sericeus, Rad., var. noticed; Magretti, Bull. Ent. Ital. xv. p. 249.

New genera and species :—

|| *Darata*, Ritsema, Notes Leyd. Mus. vi. p. 81. Allied to *Larrada*: outside of mandibles without a notch. Type, *D. schlegelii*, sp. n., *t. c.* p. 82, Sumatra.

Paraliris, Kohl, Verh. z.-b. Wien, xxxiii. pp. 353 & 361, pl. xvii. A, fig. 1 (tarsus). Allied to *Liris*; front tibiae with the outer edge not spined. Type, *P. kriechbaumeri*, sp. n., *t. c.* p. 362, Cape.

Miscophus manzonii, Gribodo, Ann. Mus. Genov. xx. p. 386, Yemen; *M. helveticus*, Kohl (= *ater*, Lep.), MT. schw. ent. Ges. vi. p. 673, Peney; *M. gallicus* (? = *ater*, Lep.), S. France, Switzerland, p. 347, *ctenopus*, N. Arabia, p. 349, and *pretiosus*, Corfu, p. 351, *id.* Verh. z.-b. Wien, xxxiii.

Liris magnifica, N. Australia, and *braueri*, Arabia, *id. t. c.* p. 356.

Notogonia japonica, Japan, and *deplanata*, Ceylon, *id. t. c.* pp. 357 & 358.

Piagetia odontostoma, *id. t. c.* p. 359, pl. xviii. fig. 9 (head), Arabia.

Tachytes ambidens, Sarepta, and *obesa* (? = *tricolor*, Lep.), Granada, Syra, *id. t. c.* pp. 364 & 365.

Tachysphex mocsaryi, Hungary, p. 367, fig. 6 (pygidium), *psilopus*, figs. 2 & 3 (wing and leg), Arabia, p. 371, *punctulatus*, figs. 4 & 5 (wing and leg), pl. xvii. A, & xviii. fig. 10 (head), Tangiers, p. 372, *latifrons*, fig. 7 (head), Brussa, p. 373, and *psilocerus*, Mexico, p. 374, *id. t. c.* pl. xvii. A.

Larrada obscura, Magretti, Ann. Mus. Genov. (2) i. p. 585, pl. i. fig. 13 (♂ organ), Soudan.

Bembicides.

Bembex notata, Dahlb., ♂ described, and *olivacea*, Fabr., noticed from the Soudan; Gribodo & Magretti, Ann. Mus. Genov. xx. pp. 387 & 388, and (2) i. p. 590.

Small wasp storing flies; Wattebled, Feuille. Nat. xiv. p. 135. Probably a *Bembex*; Gallaud, *op. cit.* p. 148.

Bembex portchinskii, Radoszkowsky, Hor. Ent. Ross. xviii., p. 26, Caucasus; *B. doria*, Magretti, Ann. Mus. Genov. (2) i. p. 590, pl. i. figs. 14 & 14a, E. Africa: spp. nn.

Sphæcius quartina, sp. n., Gribodo, Bull. Ent. Ital. xvi. p. 275, Guinea.

Nyssonides.

Stizus succineus, Klug, *vespoides*, Walk. (redescribed), *Larra apicalis*, Guér., and *Stizomorphus tridens*, Fabr., noticed from E. Africa; Magretti, Ann. Mus. Genov. (2) i. pp. 592-594.

Gorytes mystaceus, Linn. Transformations, &c., noticed; Andersson, Ent. Tidskr. v. pp. 186 & 187.

Hoplisoides, g. n., Gribodo, Bull. Ent. Ital. xvi. p. 276. Allied to *Hoplilus*; abdomen in ♂ apparently only 6-jointed, segment 6 triangular, segment 7 submembranous, and concealed. Type, *H. intricans*, sp. n., *ibid.*, Port Elizabeth.

Larra melanoptera, Mauritius, p. 353, *sumatrana*, Sumatra, p. 354, and *psilocera*, Australia, p. 355, spp. nn., Kohl, Verh. z.-b. Wien, xxxiii.

Palarus latifrons, sp. n., *id. t. c.* p. 362, pl. xviii, figs. 7 & 8 (head and pygidium), Cape.

Stizus quartina, sp. n., Gribodo, Bull. Ent. Ital. xvi. p. 275, Zanzibar.

Nysson doria, sp. n., *id. t. c.* p. 277, Sarawak.

Harpactus tauricus, Crimea, p. 27, *morawitzi* and *caucasicus*, Caucasus, p. 29, spp. nn., Radoszkowsky, Hor. Ent. Ross. xviii.

Crabronides.

KOHL, F. F. Beitrag zur Kenntniss der Hymenopteren-Gattung *Oxybelus*, Latr. Term. füzetek, viii. pp. 55, 56, & 101-116.

Includes general remarks, a list of species, and the descriptions of several new ones, and of the males of *O. treforti*, Sajó (*vide infra*), and *maculipes*, Smith. *Belomicrus* and *Alepidaspis*, Costa, and *Notoglossa*, Dahlb., are not distinct from *Oxybelus*.

Pison, Spin., is allied to *Aulacophilus* and *Trypoxylon*; *Pisonitus* and *Parapison* (= *Taranga*, Kirb.), are only subgenera: Kohl, Verh. z.-b. Wien, xxxiii. p. 335 & note.

Trypoxylon albitarse, Fabr.: contributions to life-history; Sorensen, Ent. Tidskr. v. pp. 15-17. *T. rostratum*, Tasch., = *palliditarse*, Sauss.; Kohl, t. c. p. 341, note.

Crabro clypeatus, Linn., noticed; E. Saunders, Ent. M. M. xx. p. 271.

Ammoplanus perrisi, Gir., and var. ♂ *wesmaeli*, Gir., discussed; Reinhard, Verh. z.-b. Wien, xxxiv. pp. 131-133.

Arpactophilus, Smith, recharacterized; Kohl, t. c. p. 332, pl. xviii. figs. 1 & 2-(details).

Belomicrus italicus, Cost., ♀ described; Gribodo, Bull. Ent. Ital. xvi. p. 289.

Philanthus diadema, Fabr. (= *a. telkader*, Lep.), noticed from Shoa; Gribodo, Ann. Mus. Genov. xx. p. 388, and (2) i. p. 314. *P. coarctatus*, Spin., varr. from E. Africa described; Magretti, Ann. Mus. Genov. (2) i. pp. 594 & 595.

Cerceris ornata, Fabr., and *trivialis*, Gerst., noticed from E. Africa;

Magretti, *t. c.* pp. 597 & 598. *C. ornata*, Fabr., var. *n. sicana*, and *brutia*, Costa, ♂ described from Sicily; De Stefani, *Nat. Sicil.* iii. pp. 199-202.

Chevrieria, g. n., Kohl, *MT. schw. ent. Ges.* vi. p. 658. New name for *Cemomus*, auct. (*nec* Jur., which = *Pemphredon*). To include *P. unicolor*, Shuck., *wesmaeli*, Mor. (= *lethifer*, Thoms.), and *strigatus*, Chevr.

New species :—

Pison punctulatum, Peak Downs, p. 336, *collare*, Duke of York Island, p. 337, and *fasciatum*, Mexico or Peru, p. 339, Kohl, *Verh. z.-b. Wien*, xxxiii.

Trypoxylon neglectum, S. Carolina, and *rogenhoferi*, Ypanema, *id. t. c.* pp. 340 & 342, pl. xviii. figs. 3 & 4 (heads); *T. quartinae*, Turin, p. 278, *stroudi*, Port Elizabeth, p. 279, and *magrettii*, Metemma, p. 280, Gribodo, *Bull. Ent. Ital.* xvi.

Arpactophilus steindachneri (? = *bicolor*, Smith), Kohl, *t. c.* p. 334, Australia.

Crabro hypsæ and *validus*, De Stefani, *Nat. Sicil.* iii. p. 217 & 218, Sicily.

Ectemnius punctulatus, *laevigatus* and *siculus*, *id. t. c.* pp. 219-221, Sicily.

Crossocerus palmatus, *id. t. c.* p. 221, Sicily.

Lindenius nasutus, Gribodo, *t. c.* p. 278, Kassala.

Nitela fullax, Kohl, *t. c.* p. 343, Tyrol.

Oxybelus treforti, Sajó, *Wien. ent. Z.* iii. p. 87, Hungary; *O. pharao*, p. 105, *africanus*, Cairo, p. 106, *collaris*, Arabia, p. 107, *psammobius*, Brussa, p. 108, and *insularis*, Ceylon, p. 109, Kohl, *Term. füzetek*, viii.

Notoglossa frondigera and *diphylla*, Costa, *Bull. Ent. Ital.* xv. p. 334, Sardinia.

Philanthus nitidus, Magretti, *Ann. Mus. Genov.* (2) i. p. 595, Soudan.

Cerceris mæsta, De Stefani, *t. c.* p. 198, Sicily.

Scoliides.

Tiphia sp.: larva parasitic on that of *Lachnosterna fusca*, Fröhl., and itself infested by other parasites; Lugger, *Sci. Rec.* ii. p. 232 (*cf.* *Psyche*, iv. p. 211).

Discolia ruficornis, Fabr., noticed from Shoa and Suakin; Gribodo & Magretti, *Ann. Mus. Genov.* (2) i. pp. 314 & 357.

Dielis caelebs, Sauss. & Sich., = *thoracica*, Fabr., which itself is hardly distinct from *collaris*, Fabr.; Magretti, *t. c.* p. 559.

Discolia scapulata, sp. n., Gribodo, *Ann. Mus. Genov.* (2) i. p. 362, Burmah.

Dielis wallacei, Ki Dulan, and *extranea*, Wild Island (Admiralty Islands), spp. un., Kirby, *Ann. N. H.* (5) xiii. pp. 406 & 407.

MUTILLIDÆ.

Mutilla brucei, Guer., var. from Algoa Bay noticed; this insect, as well as *M. merope*, Smith, *auramaculata*, Rad., and *arenaria*, Fabr., may be all varr. of *M. maura*, Linu.: Gribodo, *Bull. Ent. Ital.* xvi. pp. 282 & 283.

M. trinotata, Costa, = *quadripunctata*, Oliv.; *M. pedunculata*, Klug, discussed: Gribodo, Ann. Mus. Genov. xx. pp. 389-391. *M. guineensis*, Fabr., and *penetrata*, Smith, noticed from Shoa; *id. op. cit.* (2) i. pp. 315 & 316. *M. divisa*, Smith (= *interrupta*, Oliv., and *representans*, Smith), noticed from Burmah; *id. t. c.* p. 363. *M. senegalensis*, Guer., var. from Metemma noticed; Magretti, Ann. Mus. Genov. (2) i. p. 551. *M. ephippium*, Fabr.: mode of copulation described, and compared with Weijenbergh's account of that of *Tachypterus*, Guer.; Bertkau, Biol. Centralbl. iii. pp. 722-724.

Apterogyna savignyi, Klug. Variety from Yemen noticed; Gribodo, Ann. Mus. Genov. xx. p. 392.

Pseudomutilla, g. n., Costa, Rend. Acc. Nap. xxiii. p. 169. ♀ apterous; thorax much constricted in middle, forming three distinct regions as in ♂ of *Mutilla*. Type, *P. sardiniensis*, sp. n., *ibid.*, Sardinia.

New species:—

Mutilla fluonia and *eumenis*, Gribodo, Bull. Ent. Ital. xvi. pp. 281 & 282, Port Elizabeth; *M. ellipsifera*, Massana, and *chlorotica* (= *pedunculata*, Rad., nec Klug), Yemen, *id. Ann. Mus. Genov. xx.* pp. 390 & 391; *M. vicinissima* and *comotii*, *id. op. cit.* (2) i. pp. 364 & 365, Burmah; *M. sudanensis*, fig. 3, Soudan, p. 546, *sulcata*, fig. 4, Baht-es-Salaam, p. 547, *tarsispinosa*, fig. 5, *unguiculata*, fig. 6, Suakin, p. 549, *radoszkowskyi*, figs. 7 & 7a, Metemma, p. 552, *takrura*, figs. 8 & 8a, Bahr-es-Salaam, p. 553, *pavesii*, figs. 9 & 9a, Bogos, p. 554, and *aureocincta*, fig. 10, Metemma, p. 555, Magretti, Ann. Mus. Genov. (2) i. pl. i. (also Bull. Ent. Ital. xv. pp. 245-248).

Psammotherma (Mutilla) quartine, Gribodo, Bull. Ent. Ital. xvi. p. 283, Cape.

Myzine suakinensis, Magretti, Bull. Ent. Ital. xv. p. 248, and Ann. Mus. Genov. (2) i. p. 560, pl. i. fig. 2, Suakin.

FORMICIDÆ.

ANDRÉ, E. Le monde des fourmis. Feuill. Nat. xv. pp. 7-9 & 19-21.

The commencement of a popular account of the various genera of ants.

BLOCHMANN, F. Ueber eine Metamorphose der Kerne in der Ovarialeiern und über den Beginn der Blastodermbildung bei den Ameisen. Verh. Ver. Heidelb. (2) iii. pp. 243-247. (Cf. Ent. Nachr. x. pp. 345 & 347).

DAY, F. On the Habits of Ants. P. Cheltenham Soc. 1883-84. pp. 71-103.

A compilation containing much interesting matter.

EMERY, C. Materiali per lo studio della Fauna Tunisina raccolti da G. e L. Doria. III. Rassegna delle Formiche della Tunisia. Ann. Mus. Genov. (2) i. pp. 373-386.

Several new species are described. The known species which are specially noticed are as follows:—*Camponotus sylvaticus*, Oliv., and allies; *Anochetus*

species tabulated; *Cardiocondyla nuda*, Mayr, and allies; *Strongylognathus testaceus*, Schenk; *Aphenogaster testaceopilosa*, Lac., *pallida*, Nyl., *leveilli*, Emery, *subterraneus*, Latr. (outlines figured), *Barbara*, Linn.; and *Dorylus atriceps*, Shuck.

McCook, H. C. *Ants*. *Encycl. Am.* i. pp. 247-258, woodcuts.

Treats of form and structure, architecture, queen-life, development and growth of young, habits, geographical distribution, classification and bibliography, and harvesting and honey ants.

——. The Rufous or Thatching Ant of Dakota and Colorado. *P. Ac. Philad.* 1884, pp. 57-65, woodcuts.

Relates to the habits of *Formica rufa*, Linn., describing the locality and site, the exterior architecture of mounds, thatching the roofs, interior architecture, marriage flight, insectivorous habits, enemies and destructive agents, &c.

——. The Occident Ant in Dacota. *T. c.* pp. 294-296.

Relates to the distribution and site, nidification, and harvesting habits of *Pogonomyrmex occidentalis*, Cress.

——. How a Carpenter Ant founds a Formicary. *T. c.* pp. 303-307; *Ann. N. H.* (5) xiii. pp. 419-423.

Relates to *Camponotus pennsylvanicus*, De Geer.

Radoszkowsky, O. Fourmis de Cayenne Française. *Hor. Ent. Ross.* xviii. pp. 30-39.

A list of species collected by Jelski, with descriptions of 8 new ones by Mayr.

Dichtaria and *Labidus* noticed; Lichtenstein, *Bull. Soc. Ent. Fr.* (6) iv. p. 1.

Polyrhachis neptunus and *Aphenogaster hostilis*, Smith. Varieties noticed; Kirby, *Ann. N. H.* (5) xiii. pp. 405 & 406.

Myrmica malefaciens, and *Ecodoma texana*, Buckley. Habits noticed; Nehrling, *Zool. Gart.* xxv. pp. 264 & 265.

Formica fusca, Linn.: observations on building; Reuter, *S. E. Z.* xlv. p. 350. *F. ligniperda*, Latr., destroying a verandah; Reed, *Rep. E. Soc. Ont.* 1883, p. 38. *F. rufa*, Linn.: habits in peace and war; H. S. R. Matthews, *Ent. M. M.* xx. pp. 209 & 210. *F. sanguinea*, Latr., when carried to a distance from the nest, and thrown from a jar, returned to the jar; Clarkson, *Canad. Ent.* xv. p. 217.

Camponotus pennsylvanicus, De Geer, permeated by a fungus; Leidy, *Philad.* 1884, p. 9.

Lasius niger, Linn. *Lycena argus*, Linn., pupating in its company; P. Ac. Aurivillius, *Ent. Tidskr.* v. pp. 190 & 227.

Tapinoma nitens, Mayr (= *polita*, Smith), noticed; E. Saunders, *Ent. M. M.* xx. p. 270.

Drepanognathus cruentatus, Smith (?). Jumping ant observed at Hong Kong; De Marseul, *Bull. Soc. Ent. Fr.* (6) iii. pp. lxxxiii. & cv.

Solenopsis fugax, Laur., noticed; Fowler, *Ent. M. M.* xxi. p. 37. Injurious to strawberry in America; Forbes, *Rep. Ins. Illin.* xiii. pp. 112 & 113.

Various means of destroying ants ; Gard. Chron. (2) xxi. p. 752, and Bull. Insect. Agric. ix. p. 118 & 141.

Ants collecting the seeds of *Veronica hederæfolia*, L. ; Wittmack, SB. nat. Fr. 1884, p. 87.

Ants with large jaws secrete an adhesive substance which serves in the formation of their nests ; Forel, MT. schw. ent. Ges. vii. p. 3.

Remarkable colony of ants ; * Bird, Golden Chersonese (cf. Zool. Gart. xxv. pp. 348 & 349).

Ants employed on the prairies to clear clothes from lice ; McCook, P. Ac. Philad. 1884, p. 63.

Ants in 'Trinidad ; Preston, Rep. Bot. Gard. Trin., quoted in Gard. Chron. (2) xxi. p. 280.

Fire lit near an ants' nest in St. Thomas extinguished by the ants throwing themselves upon it in thousands ; Rafin, C.R. xcix. p. 212, and Ent. Nachr. x. p. 236.

Swarms of winged ants in New Zealand ; "A. H.," N. Z. J. Sci. ii. p. 128.

New species :—

Meranoplus magretti, André, Bull. Ent. Ital. xv. p. 255, fig. 1a, and Magretti, Ann. Mus. Genov. (2) i. p. 543, Suakin.

Monomorium afrum, André, t. c. p. 244, and Magretti, t. c. p. 540, Atbara.

Anochetus sedilloti, Tunis, p. 377, fig. *mayri*, St. Thomas, p. 378, *princeps*, Java, and *beccarii*, Sumatra, p. 379, Emery, Ann. Mus. Genov. (2) i.

Leptothorax laura, id. t. c. p. 380, Tunis.

Ponera constricta, Mayr, Hor. Ent. Ross. xviii. p. 31, Cayenne.

Gnamptogenys striatula, id. t. c. p. 32, Cayenne.

Tetramorium signoides, id. t. c. p. 33, Cayenne.

Pheidole jelski, p. 34, *radoszkowskii*, p. 35, *exigua* and *subarmata*, p. 36, id. t. c., Cayenne.

Cyphomyrmex conformis, id. t. c. p. 38, Cayenne.

CHRYSIDIDÆ.

Pyria lyncea, Fabr., *stilboides*, Spin. (= *Chrysis nobilis*, Klug, and *Stilbum sedentatum*, Guér.), and *Chrysis viridissima*, Klug, noticed from Shoa ; Gribodo, Ann. Mus. Genov. (2) i. pp. 316-323.

Stilbum splendidum, Fabr. (= *calens*, Fabr., *amethystinum*, Smith, *siculum*, Tourn., and *nobile*, Mocs.), *Pyria oculata*, Fabr., *Chrysis schiedtei*, Dahlb., and *fusca*, Fabr., var. *concinna* noticed from Burmah ;

Stilbum splendidum, id. t. Fabr. ; *Chrysis distinguenda*, Spin., and *mionii*, Guér., var. *abundans* ; Soudan noticed ; Magretti, Ann. Mus. Genov. (2) i. pp. 534 & 535.

Holopyga deflexa, Abeille, variety from Cairo noticed ; Gribodo, Ann. Mus. Genov. xx. p. 392. *H. gloriosa*, Fabr., preyed upon by *Phytomyza crassipes*, Fabr. ; Tömösváry, Rov. Lapok, i. pp. 141, 142, & xviii.

Chrysis andromeda, p. 317, *inops*, p. 318, *callaina* (? = *angolensis*, Rad.), p. 319, and *comottii*, E. Indies, p. 367, spp. nn., Gribodo, Ann. Mus. Genov. (2) i.

ICHNEUMONIDÆ.

BRIDGMAN, J. B. Further Additions to Marshall's Catalogue of British *Ichneumonidæ*. Tr. E. Soc. 1884, pp. 421-433.

27 species noticed, 10 new.

—, & FITCH, E. A. Introductory papers on *Ichneumonidæ*. Ent. xvii. pp. 121-128, 176-182, & 223-228, pl. ii.

Relates to the families *Agriotypidæ* and *Ophionidæ*.

E. A. Butler has published a semi-popular article on Ichneumon Flies ; Knowledge, v. pp. 244, 245, 287, & 288.

Ichneumonidæ noticed, and 2 N. American species figured ; W. Saunders, Rep. Fruit-Growers' Ass. Ont. 1882, p. 281, figs. 36 & 37.

Important list of Ichneumons and hosts, including several of the former new to Britain ; Bridgman, Ent. xvii. pp. 69-71.

Ichneumonides.

Ichneumon and *Amblyteles*. List of species (3 new) collected by Rudolphi in Norrland and Lapland ; Holmgren, Ent. Tidskr. v. pp. 63-66.

Ichneumon meridionalis, Cress., noticed and figured ; Cameron, Biol. Centr. Am. Hym. p. 142, pl. vii. fig. 2.

Crypturus argioides, Rossi (parasitic on *Polistes*), noticed ; De Stefani, Nat. Sicil. ii. pp. 280-282.

Joppa. Central American species tabulated, and several new ones diagnosed ; *J. eleganter* (= *Trogus blandita*, Cress.) and *pulchripennis*, Smith, belong to *Trogus* ; *J. maculosa*, Smith, is an *Ichneumon* ; Cameron, Ent. M. M. xxi. pp. 104-106.

Patroclus nigrocæruleus, Cress., noticed and figured ; *id.* Biol. Centr. Am. Hym. p. 136, pl. vii. fig. 1.

Phæogenes ater, Cress. Sexes described ; Cresson & Cook, Cook's Pract. Ent. pp. 17 & 18.

New species :—

Ichneumon heracliana, Bridgman, Tr. E. Soc. 1884, p. 421, England ; *I. insignitus*, Costa, Bull. Ent. Ital. xv. p. 337, Sardinia ; *I. mælleri*, Helsingland, p. 63, *ringii*, Norrland, p. 64, and *rudolphi*, Helsingland, p. 65, Holmgren, Ent. Tidskr. v. ; *I. castor*, Costa, p. 137, *pallux*, Mexico, *costaricensis*, fig. 3, Costa Rica, p. 13, E. Saül, fig. 1, *obscurus*, Guatemala, p. 139, *bilimeki*, fig. 6, Mexico, p. 140, *bellatulus*, fig. 7, Mexico, Panama, p. 141, *servedatus*, Panama, fig. 4, pl. vii, Mexico, p. 142, *decemmaculatus*, Panama, *argenteipilosus*, Guatemala, Panama, p. 143, and *stiffultus*, Panama, p. 144, Cameron, Biol. Centr. Am. Hym.

Joppa melanocephala, *varipes*, Panama, *melanostigma*, Bugaba, p. 104,

xanthostigma, Costa Rica, *maculicornis*, *nigriceps*, Panama, *rogersi*, Costa Rica, *geniculata*, Vera Paz, &c., and *xanthostoma*, Guatemala, Panama, p. 105, Cameron, Ent. M. M. xxi.

Neotypus semirufus (Kriechb., MS.), Magretti, Bull. Ent. Ital. xv. p. 242, and Ann. Mus. Genov. (2) i. p. 527, E. Africa.

Platylabus afer (Kriechb., MS.), *id. tt. cc.* pp. 242 & 527, Bogos.

Apæleticus sardous and *kriechbaumeri*, Costa, Rend. Acc. Nap. xxiii. p. 170, Sardinia.

Ischnus ridibundus and *proximus*, *id. t. c.* pp. 170 & 171, Sardinia.

Cryptides.

THOMSON, C. G. Forsök till gruppering och beskrifning af *Crypti* (Fortsättning). Opusc. Ent. ix. [1883] pp. 850-872, x. [1884] pp. 939-1028.

Extends from *Microcryptus* to *Stilpnus*.

Cryptus pygoleucus, Grav. Sexes bred; ♀ proves to be *Agrothereutes hopei*, Grav.: Bridgman, Tr. E. Soc. 1884, pp. 423 & 424.

Hemiteles sp. parasitic on *Teras malivorana*, Le Baron, noticed; Forbes, Rep. Ins. Illin. xiii. p. 183.

New genera and species:—

Microcryptus, Thomson, Opusc. Ent. ix. p. 850. Allied to *Crato-cryptus*. To include *Cryptus improbus*, *graminicola* (= *brevicornis*, *humilis*, and *perigrinator* ♂ var. 1), *curvus* (= *fulvipes*), *perspicillator* (= *abdominator* var. 3), *arrogans* (= *abdominator* var. 1), *abdominator* (= *jejunator*), *leucostictus*, and *cretatus*, Grav., *terminatus*, Grav. (= *gilvipes*, Grav., and *ceilonotus*, Tasch.), *nigrocinctus* (= *fulveolatus* and *jucundus*), *triannulatus*, Grav., *arridens*, Grav. (= *probus*, Tasch.), *erythrinus*, *lacteator*, *sperator*, Grav., *buzizonius*, Grav. (= *varicolor*, Grav., and *pteronomorum*, Hart.), *sericans*, *brachypterus* (= *jejunator* var. 2), *micropterus* (= *jejunator* var. 1), *gravipes*, Grav. (= *bifrons*, Grav.), *halensis*, Tasch., and *contractus*, Grav. (♂ = *subguttatus*, Grav.); and the following new Swedish species:—*M. opaculus* and *aries*, p. 851, *rubricollis* and *femoralis*, p. 853, *gravenhorsti*, p. 854, *orbitalis*, p. 856, *areolaris*, p. 858, *punctifer* and *nigricornis*, p. 860, *longicauda*, *lapponicus*, *borealis*, p. 862, *septentrionalis*, *alutaceus*, p. 863, *distans*, p. 864, and *puncticollis* (♂ = *improbus*, Grav.), p. 866.

Acanthocryptus, *id. t. c.* p. 837. Allied to last. To include *Cryptus flagitator* (= *pumilio*), *4-spinosus*, and *nigrita*, Grav., and *nigricollis* and *nigriceps* (= *4-spinosus* var. 1, Grav.), spp. nn., *t. c.* p. 868, Sweden.

Gnathocryptus, *id. t. c.* p. 869. Section of *Stylocryptus*. Types, *Cryptus vagabundus*, Grav., and *S. (G.) clypealis*, sp. n., *t. c.* p. 870, Sweden.

Stylocryptus, *id. t. c.* p. 869. An aberrant genus; antennæ thick, filiform, scape long, cylindrical, apex not excised. The typical section includes *Cryptus parviventris*, *brevis*, *senilis*, and *erythrogaster*, Grav., and *analís* and *minutulus*, spp. nn., *t. c.* pp. 871 & 872, Sweden.

Leptocryptus, Thomson, *op. cit.* x. p. 963. Allied to *Hemiteles* and *Phygadeuon*; but with more slender antennæ, &c. To include *Cryptus claviger* Tasch., *æreus* and *pellucidator*, Grav., and *ruficaudatus*, Bridgm.; add *L. strigosus*, p. 964, *lamina* and *brevis*, p. 965, *geniculosus*, *rugulosus*, p. 966, and *heteropus*, p. 1040, spp. nn., *t. c.*, Sweden.

Paruptesis, Magretti, Bull. Ent. Ital. xvi. p. 100. Allied to *Aptesis*; but the first segment of the abdomen is not punctured, but finely and longitudinally striated. Type, *P. flavipes*, sp. n., *t. c.* p. 101, pl. ii. figs. 2 & 2a, b, Florence.

Hemiteles microstomus and *scabriculus*, p. 969, *pallicorpus* and *capreolus*, p. 970, *bidentulus*, p. 971, *rufulus*, p. 972, *capra* and *unicolor*, p. 974, *apaculus*, *nigriventris*, p. 975, *obscuripes*, *rubripes*, p. 976, *cynipinus*, *punctiventris* and *auriculatus*, p. 977, *distans* and *rugifrons*, p. 978, *plumbeus* and *rubricollis*, p. 979, *longicauda*, *gibbifrons*, and *ornatulus*, p. 980, *elymi* and *albipalpus*, p. 981, *melanogaster* and *æneus*, p. 982, *infumatus* and *rugifer*, p. 983, *fumipennis*, *costalis*, and *brevicauda*, p. 984, *macrurus*, p. 985, *areolaris*, p. 986, *nigricornis* and *stagnalis*, p. 987, *geniculatus*, *longicaudatus*, and *gracilis*, p. 989, *solutus* and *apertus*, p. 990, *triannulatus*, *hadrocerus*, and *monodon*, p. 991, *inflatus*, *gracilipes*, and *cyclogaster*, p. 992, *trochanteratus*, *ungularis*, and *magnicornis*, p. 994, *validicornis*, *fasciatus*, and *breviareolatus*, p. 995, *longulus*, *constrictus*, and *alpinus*, p. 997, *arcticus*, p. 998, and *fulcatus*, p. 999, Thomson, Opusc. Ent. x., Sweden.

Attractodes marginatus, *petiolaris*, and *filicornis*, p. 1020, *ripicola* and *flavipes*, p. 1021, *tenuipes*, p. 1022, *liogaster*, *breviscapus*, and *compressus*, p. 1023, *flavicoxa* and *parallelus*, p. 1024, *crassicornis* and *rustipes*, p. 1025, and *alutaceus*, p. 1026, *id. t. c.*, Sweden.

Stilpnus crassicornis and *angustatus*, p. 1027, and *tenuipes*, p. 1028, *id. t. c.*, Sweden.

Phygadeuon grandis, p. 940, *pimplarius*, p. 941, *recurvus*, p. 943, *parvipennis*, p. 944, *anurus*, *longiceps*, and *caudatus*, p. 946, *pallicarpus*, *longigena*, and *annulicornis*, p. 947, *curvispina*, p. 948, *liogaster*, p. 949, *monodon*, *grandiceps*, p. 950, *ungularis*, p. 951, *facialis*, *lapponicus*, p. 952, *punctigena*, p. 953, *acutipennis*, p. 954, *brachyurus*, *punctiventris*, and *læviventris*, p. 955, *tenuicosta*, p. 957, *bidens*, p. 958, *brevitarsis*, *inflatus*, p. 959, *tenuiscapus*, *oppositus*, p. 960, *flavicans*, *cubiceps*, and *scaposus*, p. 961, *punctipleuris*, *submuticus*, *trichops*, p. 962, *dimidiatus*, *rotundipennis*, and *ovalis*, p. 963, *rugipectus* and *liosternus*, p. 1040, *id. t. c.*, Sweden.

Cryptus bicolor, De Stefani, Nat. Sicil. iii. p. 153, Sicily; *C. hæmatorius* and *leucozonatus*, Costa, Bull. Ent. Ital. xv. p. 337, Sardinia.

Stibiteutes (?) *atratus*, De Stefani, *t. c.* p. 157, Sicily.

Pezomachus higgii (with parallel description of *P. bicolor*, Grav., for comparison), p. 154, *ragusæ*, p. 155, *semirufus* and *pusillus*, p. 156, and *carbonarius*, p. 157, *id. t. c.*, Sicily; *P. affinis*, Magretti, Bull. Ent. Ital. xvi. p. 100, pl. ii. figs. 1 & 1a-d, Florence; *P. myrmecinus*, p. 1001, *pilosulus*, p. 1003, *spinula*, p. 1006, *grandiceps*, p. 1007, *gonatopinus*, p. 1008, *mandibularis*, p. 1009, and *breviceps*, p. 1017, Thomson, *t. c.*, Sweden.

Ophionides.

Ophion purgatus, Say, bred from larva of *Mamestra picta*, Harr.; Caulfield, Canad. Ent. xvi. pp. 122 & 123. *O. macrurum*, Linn., infesting pupæ of *Samia columbia*, Smith; Weed, Papilio, iv. p. 112.

Paniscus glaucopterus, Linn. Parthenogenesis; Von Siebold, Ent. Nachr. x. p. 95.

Limneria gracilis, Grav. (?), *cylindrica* and *ovata*, Brischke, and *robusta*, Woldst., noticed, and the first redescribed; Bridgman, Tr. E. Soc. 1884, pp. 427-429.

Eiphosoma sp. parasitic on *Phoxopteris comptana*, Fröl., briefly described; Cook, Pract. Ent. p. 19.

New species:—

Anomalon cylindricum and *minutum*, Bridgman, Tr. E. Soc. 1884, pp. 424 & 425, England.

Paniscus lineolatus, Costa, Bull. Ent. Ital. xv. p. 337, Sardinia.

Campoplex semiflavus, *id. ibid.*, Sardinia.

Charops breviceps (Kriechb., MS.), Magretti, Bull. Ent. Ital. xv. p. 243, and Ann. Mus. Genov. (2) i. p. 529, Metemma.

Casinaria (?) *magrettii*, Kriechbaumer, Ann. Mus. Genov. (2) i. p. 529, and Magretti, Bull. Ent. Ital. xv. p. 243, Bahr-el-Salaam.

Limneria elishæ, p. 426, *ruficornis*, *rufata*, p. 429, and *reticulata*, p. 430, Bridgman, *t. c.*, England.

Cremastus pleurovittatus, Costa, *t. c.* p. 337, Sardinia; *C. pallidus* (Kriechb., MS.), Magretti, *tt. cc.* pp. 243 & 530, E. Africa.

Mesochorus facialis, Bridgman, *t. c.* p. 431, England.

Tryphonides.

THOMSON, C. G. Bidrag til kannedom om Skandinaviens Tryphoner. Opusc. Ent. ix. pp. 873-936.

The family is divided into 3 "tribes": *Oteniscina*, *Tryphonina*, and *Mesoleptina*; and these again into "sub-tribes." Many new genera and species are described. The following synonymy occurs:—*Adelognathus pallipes*, Grav. (= *ruthei*, Holmgr.), *ohrysopygus*, Grav. (= *pallipes*, Holmgr.), *Delotomus cephalotes*, Grav. (= *orbitatorius*, Holmgr.), *Tryphon brunniventris*, Grav. (= *fulviventris*, Holmgr.), *Perilissus orbitalis*, Grav. (= *bucculentus*, Holmgr.), *Catoglyptus antilope*, Grav. (= *pulchricornis*, Holmgr.), *Euryproctus albipes*, Holmgr. (= *tuberculatus*, Holmgr.), *mundus*, Grav. (= *bivinctus*, Holmgr.).

Mesoleptus facialis, Grav. (new to Britain), recorded from Surrey; Capron, Ent. xvii. p. 47.

Mesoleptus sepulchralis, Holm. (parasitic on *Zurcea fasciata*, Linn.), recorded as new to Britain, and ♂ described; Bridgman, Ent. M. M. xx. p. 228, and Tr. E. Soc. 1884, p. 432.

Bassus latatorius, Fabr., bred from a larva of *Syrphus*; Bignell, Ent. xvii. p. 167.

Scelobates varipes, Smith. Habits, &c., noticed; Hudson, Ent. xvii. p. 171.

New genera and species:—

Pammicrus, Thomson, Opusc. Ent. ix. p. 880. Section of *Adelognathus*. Type, *Hemiteles dorsalis*, Grav.

Tricamptus, *id. t. c.* p. 886. Section of *Exenterus*. Type, *E. apiarius*, Grav.

Picroscopus, *id. t. c.* pp. 882 & 888. *Cteniscina*. Type, *C. ictericus*, Grav.

Smicroplectus, *id. t. c.* pp. 882 & 888. Next to last. Types, *C. jucundus*, Holmgr., and *S. costulatus*, sp. n., *t. c.* p. 888, Lapland.

Diaborus, *id. t. c.* pp. 882 & 888. Placed after last. To include *Ichneumon lituratorius*, Linn., and *D. frontalis*, *pallitarsis*, *flilpalpis*, and *nigrifrons*, spp. nn., *t. c.* p. 889, Sweden.

Eridolius, *id. t. c.* pp. 882 & 889. Next to last. Type, *Cteniscus pygmaeus*, Holmgr.

Dyspetus, *id. t. c.* pp. 895 & 899. *Tryphonina*. Type, *Tryphon prarogator*, Grav.

Otoblastus, *id. t. c.* pp. 895 & 899. Next to last. Type, *Tryphon luteo-marginatus*, Grav.

Nemioblastus, *id. t. c.* pp. 895 & 901. Section of *Polyblastus*. To include *P. melanostigma*, Holmgr., *palemon*, Schiödt, and *P. (N.) albicoxa*, sp. n., *t. c.* p. 901, Sweden.

Ctenacmus, *id. ibid.* Section of *Polyblastus*. To include *P. (C.) scutellaris*, p. 901, *nigripalpis* and *genalis*, p. 902, spp. nn., *t. c.*, Sweden.

Scopiorus, *id. t. c.* pp. 895 & 902. Section of *Polyblastus*. To include *P. spherocephalus*, Grav., and *P. (S.) angulatus*, p. 902, *fusicornis* and *marginatus* (= *arcuatus*, Holmgr.), p. 903, spp. nn., *t. c.*, Sweden.

Trichocalymnus, *id. t. c.* pp. 895 & 903. Section of *Polyblastus*. To include *P. pratensis* and *propinquus*, Grav.

Neliopisthus, *id. t. c.* pp. 907 & 908. Placed after *Ædimopsis*. Type, *Phytodictus elegans*, Ruthe.

Thymarus, *id. t. c.* pp. 907 & 908. Next to last. Types, *T. compressus* and *collaris*, spp. nn., *t. c.* p. 909, Sweden.

Oxytorus, *id. t. c.* p. 910. Next to last. Type, *O. armatus*, sp. n., *ibid.*, Sweden.

Cullidiotes, *id. ibid.* Next to last. Type, *Atractodes coxator*, Grav. (= *varicornis*, Holmgr.).

Spanotecnus, *id. t. c.* p. 911. Section of *Perilissus*. Types, *P. filicornis*, *vernalis*, Grav., *lutescens*, Holmgr., and *P. (S.) coxalis* and *spiniger*, *id. t. c.* p. 912, Sweden.

Polyoncus, *id. t. c.* p. 912. Section of *Perilissus*. To include *P. erythrocephalus*, Grav., *buccinator*, Holmgr., and *gracilis*, sp. n., *t. c.* p. 913, Sweden.

Lophyprolectus, *id. t. c.* p. 915. Section of *Perilissus*. Type, *Paniscus oblongopunctatus*, Hart.

Lophyroscopus, *id. ibid.* Section of *Perilissus*. Types, *P. gorskii*, Ratz., *pictilis*, Holmgr., and *P. (L.) nigricollis*, sp. n., *ibid.*, Sweden.

Lathrolestes, *id. t. c.* pp. 911 & 916. Placed after *Perilissus*. To include *P. clypeatus*, Zett., *macropygus*, Holmgr. (= *soleatus*, Holmgr.), and

pleuralis, p. 916, *caudatus*, *marginatus*, *luteolus*, p. 917, and *ungularis*, p. 918, spp. nn., t. c., Sweden.

Hadrodactylus, Thomson, t. c. p. 918. Allied to *Mesoleptus*. To include *M. paludicola*, *femoralis*, *gracilis*, *confusus*, and *macroductylus*, Holmgr., *seminiger*, Grav. (= *semirufus*, Holmgr.), *vulnerator*, Zett. (= *curtus*, Holmgr.), *fugax* and *xanthostigma*, Grav., and *H. bidentulus*, *tarsator*, *villosulus*, p. 919, *laticeps*, *gracilipes*, Sweden, *nigrifemur*, Lapland, p. 920, *genalis* and *albicoxa*, Sweden, p. 921, spp. nn.

Rhastus, id. t. c. p. 924. Allied to *Catoglyptus*. Type, *Grypocentrus rufipes*, Holmgr.

Himertus, id. t. c. p. 926. Section of *Euryproctus*. To include *E. varicornis*, Grav., and *E. (H.) bisannulatus* (= *defectivus*, Holmgr.), sp. n., t. c. p. 927, Sweden.

Syndipnus, id. t. c. p. 927. Section of *Euryproctus*. To include *E. erythropalpus*, *tenuicornis*, and *xanthostomus*, Grav., *Mesoleius tenellus* and *transfuga*, *Tryphon assimilis*, and *Trematopygus conformis*, Holmgr., and *E. (S.) macrocerus* and *atricornis*, spp. nn., id. t. c. p. 928, Sweden.

Hodostatus (or *Hodustatus*), id. t. c. p. 929. Allied to *Trematopygus*. Type, *H. brevis*, sp. n., *ibid.*, Lund.

Barytarbus, id. t. c. p. 931. Section of *Mesoleius*. To include *M. virgultorum*, *adpropinquator*, and *colon*, Grav., and *M. (B.) lauiusculus* and *annulipes*, spp. nn., t. c. pp. 931 & 932, Sweden.

Spudæus, id. t. c. p. 932. Section of *Mesoleius*. To include *M. erosus*, Holmgr., *leucosternus*, Grav., and *M. (S.) confusus*, sp. n., *ibid.*, Sweden.

Saotus, id. t. c. p. 933. Section of *Mesoleius*. To include *M. (S.) emarginatus*, *tricolor*, p. 933, *brevispina*, *compressiusculus*, Sweden, *heteropus*, Lapland, p. 934, *rubidus*, Dovre, and *crassitarsis*, Scania, p. 935, spp. nn., t. c.

Exochus fletcheri, Bridgman, Tr. E. Soc. 1884, p. 432, Wicken Fen.

Adelognathus puncticollis, *punctiventris*, *scabriculus*, p. 877, *fasciatus*, *lavicollis*, p. 878, *aciculatus*, *punctulatus*, p. 879, and *facialis*, p. 880, Thomson, Opusc. Ent. ix., Sweden.

Exyston carinatus, p. 882, *genalis*, *calcaratus*, and *brevipetiolatus* (= *Exenterus triangulatorius*, Holmgr.), p. 883, id. t. c., Sweden.

Delotomus auriculatus, p. 884, *calcaratus*, *marginatus*, p. 885, *binotatus* and *parvulus*, p. 886, id. t. c., Sweden.

Exenterus simplex, *claripennis*, and *flavellus*, id. t. c. p. 887, Sweden.

Oteniscus brevipennis, p. 890, *albicans*, *t-nigrum*, Sweden, p. 891, *4-notatus*, Lapland, *punctipes*, p. 892, *signifer*, *punctipleuris*, *brevigena*, p. 893, *deletus* and *genalis*, Sweden, p. 894, id. t. c.

Tryphon auricularis, *bidentulus*, *pleuralis*, and *erythrogaster*, id. t. c. p. 897, Sweden.

Polyblastus subtilis, id. t. c. p. 900, Sweden.

Monoblastus longigena, id. t. c. p. 903, Lapland.

Erromenus cavigena, *brevitarsis*, p. 904, *arenicola* and *simplex*, p. 905, id. t. c., Sweden.

Gymnocentrus apicalis, id. t. c. p. 905, Sweden.

Edimopsis limbata, id. t. c. p. 907, Sweden.

Perilissus frontator, *albitarsis*, *compressus*, and *emarginatus*, Thomson, t. c. p. 914, Sweden.

Ctenopelma verticina, id. t. c. p. 925, Sweden.

Notopygus mordax, id. *ibid.*, Sweden.

Euryproctus parvulus, id. t. c. p. 926, Sweden.

Trematopygus scabriculus and *curvispina*, id. t. c. p. 930, Sweden.

Pimplides.

Pimpla (Rhysæa) lunator, Fabr. Habits; Gade, Bull. Brooklyn Soc. vii. pp. 103 & 104.

Ephialtes submaculatus and *Xylonomus filiformis*, Grav., bred from *Rhagium mordax*, Fabr.; Fallou, Bull. Soc. Ent. Fr. (6) iii. p. cxxxvi.

Pimpla similis, Bridgman, Tr. E. Soc. 1884, p. 433, Norwich; *P. cer-copilhecus*, *apricaria*, and *cingulatella*, Costa, Rend. Acc. Nap. xxiii. p. 170, Sardinia: spp. nn.

Lissonota pectoralis, id. t. c. p. 171; *L. maculipennis*, id. Bull. Ent. Ital. xv. p. 338, Sardinia: spp. nn.

Xylonomus distinguendus, sp. n., Magretti, Bull. Ent. Ital. xvi. p. 102, Florence.

BRACONIDÆ.

Bracon brovicornis, Wosm., parasitic on *Ephestia*; Kirby, P. E. Soc. 1884, p. xxxi.

Iphiaulax impostor, Scop., var. (?) from Suakin noticed; Magretti, Ann. Mus. Genov. (2) i. p. 531.

Apanteles oletæ, Riley, dissected for examination by *Trogoderma tarsale*, Melsh.; Howard, Psyche, iv. p. 132.

Microgaster. Extraordinary abundance on *Pieris brassicæ* at Nancy; Millot, Bull. Soc. Ent. Fr. (6) iii. pp. cxvii. & cxviii.

Aphidius. Note on a New Zealand species; Hudson, Ent. xvii. pp. 170 & 171.

Cælinius niger, Nees (parasitic on *Chlorops tæniopus*, Meig., and *Oscinis frit*, Linn.), noticed; Spångberg, Ent. Tidskr. v. pp. 203 & 231.

New species:—

Bracon geniculator and *humulator*, Costa, Rend. Acc. Nap. xxiii. p. 172, Sardinia; *B. trisignatus*, Philippines, and *stigmaticus*, Ki Dulan, Kirby, Ann. N. H. (5) xiii. p. 404.

Rogas basalis, Costa, t. c. p. 172, Sardinia.

Apanteles orobenæ, Forbes, Rep. Ins. Illin. xii. p. 104, Illinois.

Dinocampus pallidipes, Costa, t. c. p. 172, Sardinia.

Macrocentrus procerus, id. *ibid.*, Sardinia.

Hormiopterus pictipennis, Reinhard, Verh. z.-b. Wien, xxxiv. p. 133, Pillnitz.

Cælinius meromyzæ, Forbes, Rep. Ins. Illin. xiii. p. 26, pl. ii. figs. 1 & 2 (parasitic on *Meromyza americana*, Fitch, in Illinois).

EVANIIDÆ.

THOMSON, C. G. Öfversigt af de i Sverige fauna arter af Hymenopter-slägtet *Fænus*. Opusc. Ent. ix. [1883] pp. 843-850.

10 species of *Fænus* described, 6 new. *F. grandithorax*, Tourn., = *jaculator*, Linn.

Evania dimidiata, Spin. Local race from Suakin described; Magretti, Ann. Mus. Genov. (2) i. p. 526.

Fænus subtilis, p. 847, *fumipennis* and *bidentulus*, p. 848, *borealis*, *longigena*, and *nigritarsis*, p. 849, Sweden, Thomson, *t. c.*; *F. rugidorsum*, Costa, Rend. Acc. Nap. xxiii. p. 173, Sardinia: spp. nn.

CHALCIDIDÆ.

PATTON, W. H. Some Notes on the Classification and Synonymy of Fig-Insects. P. E. Soc. 1884, pp. xiv.-xvii.

The writer gives reasons for referring these insects to the *Chalcididæ*; he characterizes the *Agaonidæ*, and gives the following synonymy of several fig-insects described by Walker in duplicate:—*Sycophila*, Walk. (= *Pseudina* and *Isanisa*, Walk.), *S. megastigmoides*, Walk. (= *P. smigroides*, Walk.), *S. decatomoides*, Walk. (= *I. decatomoides*, Walk.), *Sycobia*, Walk. (= *Agrionina*, Walk.), *S. bethyloides*, Walk. (= *A. myrmecoides*, Walk.), *Polanisa*, Walk. (= *Idarnella*, Westw.), *I. transiens*, Walk. (= *P. lutea*, Walk.), *Idarnes stabilis*, Walk. (= *I. orientalis*, Walk.).

SAUNDERS, S. S. Further Notes on the Caprification of Domestic Figs, with reference to Paul Mayer's comments thereon. Tr. E. Soc. 1884, pp. 97-106.

Cameron, Biol. Centr. Am. *Hym.* pp. 83-99, pl. iv., notices *Smicra concinata*, and *miranda*, Cress., figs. 13 & 13a, *captiva*, Smith (= *adaptata*, Walk.), and *abdominalis*, Walk. (= *ambigua*, Cress.), *Phasgonophora thoracica*, Sich. (= *condalus*, Walk.), and *Chalcis ovata*, Say (= *annulipes*, Walk., *incerta*, Cress., and *Brachymeria panamensis*, Holmgr.), figs. 16 & 16a-d.

Chalcis xerxena, Walk. (?), or sp. n. (?), from Metemma, described; Magretti, Ann. Mus. Genov. (2) i. p. 532.

Megastigmus collaris, Boh.: notes on habits; it is not a parasite, but the larva lives in the fruit of wild roses; Wachtl, Wien. ent. Z. iii. pp. 38 & 39. *M. pictus*, Först., ♀ noticed; *id. t. c.* p. 214.

Isosoma orchidearum, Westw., noticed; Fitch, P. E. Soc. 1884, p. xi. *I. tritici*, Riley. Life-history, habits, &c.; Forbes, Rep. Ins. Illin. xiii. pp. 39-40, pl. ii. figs. 3 & 4.

Choreia inepta, Dulm., and an allied new species, discussed; De Stefani, Nat. Sicil. iii. pp. 305-308.

Eupelmus allynii, French, is parasitic on *Isosoma hordei*, Harr., and *elymi*, French; French, Canad. Ent. xvi. pp. 123 & 124.

Resemblance of a species of *Cleonymidæ* to an Hemipterous insect; Pascoe, P. E. Soc. 1884, p. xx.

Micromelus pyrrhogaster; Walk., bred from galls of *Mecinus collaris*, Germ.; Bignell, Ent. xvii. p. 46.

Pteromalus muscarum, Walk., hyperparasitic on *Cælinius niger*, Nees, noticed; Spångberg, Ent. Tidskr. v. pp. 204 & 231.

Aximine, subfam. n., Cameron, Biol. Centr. Am. *Hym.* p. 111. Head formed as in *Dirrhinus*; differs from *Chalcidina* in its metallic coloration; prothorax much more strongly developed; and ovipositor as long as the abdomen. To include *Axima*, Walk., and a new genus.

New genera and species :—

Acanthochalcis, Cameron, Biol. Centr. Am. *Hym.* p. 100. Resembles *Leucospis*; ovipositor not recurved; wings not folded. Type, *A. nigricans*, sp. n., t. c. p. 101, pl. vi. figs. 14 & 14a, Mexico.

Lirata, id. t. c. p. 102. Differs from *Thoracantha* and *Kapala* by the very long 3rd joint of the antennæ. Type, *L. luteogaster*, sp. n., *ibid.* (*Schizaspidia luteogaster*, pl. v. figs. 16 & 16a), Panama.

Kapala (= *Chirocerus*, Brullé, nec Latr.), id. t. c. p. 102. Type, *K. furcata*, Fabr. (= *flabellata*, Fabr.), noticed and figured; t. c. p. 103, pl. v. figs. 17 & 17a-c.

Lophyrocera, id. t. c. p. 103. Proposed for the New World species allied to *Schizaspidia*. Types, *L. stramineipes*, Panama, and *nigromaculata*, Nicaragua, spp. nn., t. c. pp. 103 & 104, pl. v. figs. 18, 18a, 19, & 19a, b.

Orasema, id. t. c. p. 104. Differs from *Stilbula* by its simple antennæ in the ♂, ovipositor very strongly built, and very broad. Type, *O. stramineipes*, sp. n., t. c. p. 105, pls. v. figs. 20 & 20a-c, vi. figs. 18 & 18a-c, Panama.

Bephrata, id. t. c. p. 109. Allied to *Eurytoma*; joints of antennæ longer and thinner, the last not clavate; marginal branch of the ulna much longer; abdomen long, strongly compressed. Type, *B. ruficollis*, sp. n., *ibid.* pl. v. figs. 13 & 13a, Panama.

Paralæsthia, id. t. c. p. 110. Allied to *Theocolax*; mandibles enormously developed, head with a very long and deep suture, and basal abdominal segments more developed. Type, *P. mandibularis*, sp. n., t. c. p. 111, pl. v. figs. 15 & 15a-f, Panama.

Hontalia, id. t. c. p. 112. Allied to *Axima*; antennæ 13-jointed; hind femora with a blunt tooth at the base, and bluntly keeled. Types, *H. cerulea*, Nicaragua, and *ruficornis*, Panama, spp. nn., t. c. p. 113, pl. vi. figs. 1, 1a, 2, & 2a-c.

Brasema, id. t. c. p. 124. Allied to *Eupelmus*; 2nd abdominal segment short, not incised. Type, *B. brevispina*, sp. n., *ibid.*, Guatemala.

Lutnes, id. t. c. p. 124. Allied to *Calosoter* and *Selindenia*. To include *L. ornaticollis*, fig. 16 & 16a, p. 125, *dromedarius*, *crassicornis*, fig. 15, pl. vi. p. 126, and *longiventris*, p. 127, spp. nn., t. c., Panama.

Aseirba, id. t. c. p. 127. *Eupelminæ*; placed after *Lutnes*. Type, *A. caudata*, sp. n., t. c. p. 128, pl. vi. fig. 13, Guatemala.

Amotura, id. t. c. p. 130. Allied to *Epistenia*; ovipositor extending beyond the tip of the abdomen, and originating quite close to the

base. Type, *A. annulicornis*, sp. n., t. c. p. 131, pl. vi. figs. 6 & 6a-c, Nicaragua.

Smicra sexidentata, p. 81, *octodentata*, *sicheli* (= *Conura scutellaris*, Sich., nec Cress.), Mexico, p. 82, *nigromaculata*, pl. iv. figs. 15 & 15a, b, Guatemala, p. 83, *cardinalis*, fig. 5, Panama, *ferruginea*, Guatemala, p. 84, *miniata*, Nicaragua, Guatemala, *trituberculata*, Guatemala, Panama, p. 85, *geniculata*, fig. 4, Mexico, p. 87, *octomaculata*, fig. 8, *maculicollis*, fig. 7, Panama, p. 88, *centralis*, Mexico, p. 89, *dorsivittata*, fig. 2, *panamensis*, fig. 3, p. 90, *nigrifrons*, fig. 9, pl. v. p. 91, *maculipennis*, Panama, *fulvo-variegata*, Mexico, p. 92, *fulvo-maculata*, Panama, *obtusiventris*, Mexico, p. 93, *dorsimaculata*, *petioliventris*, Guatemala, p. 95, and *nigri-ventris*, pl. iv. figs. 14 & 14a, b, Panama, p. 96, Cameron, Biol. Cent. Am. *Hym.*

Phasganophora rufitarsis, id. t. c. p. 98, pl. v. figs. 10 & 10a-d, Panama.

Halticella ornaticornis, id. t. c. p. 100, Panama.

Torymus inula, Wachtl, Wien. ent. Z. iii. p. 6, Vienna.

Diomorus rufipes and *mayri*, pl. iv. figs. 17 & 17a-b, Cameron, t. c. pp. 105 & 106, Guatemala.

Syntomaspis maculipennis, id. t. c. p. 107, Mexico.

Eurytoma aurifrons, figs. 11 & 11a-c, *argentata*, Guatemala, and *petioliventris*, fig. 12, pl. v., Panama, id. t. c. p. 108.

Isosoma grandis, Riley, Bull. Brooklyn Soc. vii. p. 111, Indiana.

Spalangia chontalensis, Cameron, t. c. p. 110, pl. v. figs. 14 & 14a, Nicaragua.

Schizaspidia murrayi, Kirby, Ann. N. H. xiii. (5), p. 403, Tongatabu.

Choreia proserpine, De Stefani, Nat. Sicil. iii. p. 307, pl. iii. figs. 3-5, Sicily.

Eupelmus albitarsis, Costa, Bull. Ent. Ital. xv. p. 338, Sardinia; *E. compressicornis*, fig. 12, p. 115, *gigas*, figs. 9 & 9a, Panama, p. 116, *testaceus*, figs. 10 & 10a, pl. vi., *brevipennis*, Panama, p. 117, *testaceicornis*, *geniculatus*, p. 119, *albispina*, *bimaculatus*, Panama, p. 120, *gracilis*, Guatemala, *erythrothorax*, pl. vi. fig. 11, Panama, *hyalinipennis*, p. 121, *flavipes*, Guatemala, *cingulatus*, Guatemala, Panama, p. 122, *petiolaris*, Guatemala, and *fasciiventris*, Panama, p. 123, Cameron, t. c.

Pachyneuron altiscuta, Howard, Cook's Pract. Ent. p. 13 (parasitic on Coccideæ in Michigan).

Pteromalus gelechia, Forbes, Rep. Ins. Illin. xii. p. 151 (parasitic on *Gelechia cerealella*, Oliv.), United States.

Epistenia balteata, figs. 3 & 3a, Guatemala, p. 129, *maculipes*, figs. 4 & 4a-c, pl. vi., and *rufipes*, Panama, p. 130, Cameron, t. c.

Lelaps albipes, fig. 8, p. 132, *ferruginea*, figs. 7 & 7a, and *tibialis*, p. 133, id. t. c. pl. vi., Panama.

Prionopelma vilipes, id. t. c. p. 134, pl. vi. figs. 5 & 5a, b, Nicaragua.

PROCTOTRUPIDÆ.

Ceraphron destructor, Say, is erroneously stated by Say to shed its wings after copulation; Howard, Psyche, iv. p. 206.

Chelogynus lapponicus, Thoms., noticed; Billups & Fitch, P. E. Soc. 1884, p. xx.

Teles sp. (parasitic on the eggs of *Æcanthus niveus*, De Geer). Early life-history described; Ayers, Mem. Bost. Soc. iii. pp. 261-272, pls. xxiv. & xxv. The larva passes through at least four ecdyses; but its full development has not yet been observed.

Platygaster sp. parasitic on *Anisopteryx pometaria*, Mann. Oviposition described; Packard, Am. Nat. xviii. pp. 28 & 29.

Pristocera afra, sp. n., Magretti, Ann. Mus. Genov. (2) i. p. 533, pl. i. fig. 1, Bahr-el-Salaam and Metemma.

Meteorus splendens and *scutatus*, spp. nn., Costa, Rend. Acc. Nap. xxiii. pp. 171 & 172, Sardinia.

CYNIPIDÆ.

* SEGVELT, E. VAN. Les Cynipides et leurs Galles, Locataires et Parasites. Rev. Quest. Sci. Brux. 1883, pp. 47, 10 figs. (Full analysis in Wien. ent. Z. iii. pp. 29 & 30.)

TRAIL, J. W. Dimorphism in Oak-Gall Makers, and in their Galls. P. Perthshire Soc. i. pp. 120-132.

A popular digest of the observations of Adler, Cameron, and others, with special reference to Scotch species.

On the synonymy of various *Cynipidæ*; Wachtl & Dalla Torre, Wien. ent. Z. iii. pp. 35-87, 137, & 138.

Notes on the *Cynipidæ* of Hungary (81 species); Pazlavszky, Math. Nat. Ber. Ung. i. pp. 214-223, and Rov. Lapok, i. pp. 70-74, fig. 20, and pp. 213-227 & xxviii.

Andricus xanthopsis, Schlecht., *amenti*, Mayr, *Neuroterus aprilius*, Gir., *schlechtendali*, Mayr, and *Aphlothrix* (*Andricus*) *solitaria*, Beyer., noticed; Schlechtendal, Z. Naturw. lvii. pp. 338 & 339, and Wien. ent. Z. iii. pp. 99-106.

Cynips superfetationis, Gir., redescribed, with detailed account of gall; Paszlavszky, Wien. ent. Z. iii. pp. 147-151.

Aulax hieracii, Linn. (?), noticed; Andersson, Ent. Tidskr. v. p. 188.

Onix [g. n. (?), vel err. impr.]. Peculiar structure of the head of a small species bred from galls on *Berberis cerris*; Mayr & Forel, MT. schw. ent. Ges. vii. pp. 8 & 9.

New species :—

Aulax rufipes, Cameron, Tr. E. Soc. 1884, p. 485, Mexico.

Cothonaspis rufiventris, id. t. c. p. 486, Mexico.

Eucæla incisa, id. *ibid.*, Mexico.

Megapelmus mexicanus, id. t. c. p. 487, Mexico.

Ibalia ruficollis, id. t. c. p. 488, Mexico.

SIRICIDÆ.

JACOBS, —. [Vide *Tenthredinidæ*, infra.]

Sirex gigas, Linn., accompanying a swarm of Dragon-flies; Keil, Ent. Nachr. x. p. 234. *S. juvencus*, auct., found in a gallery apparently

formed by *Rhopalopus femoratus*, Linn.; Decaux, Feuille. Nat. xiv. p. 53.

Tremex columba, Linn., popularly described and sexes figured; W. Saunders, Rep. Fruit-Grower's Ass. Ont. 1882, p. 272, figs. 9 & 10.

Xiphydria albicornis, Harr., redescribed, with notice of habits, &c.; it is destructive to maple: Harrington, Rep. E. Soc. Ont. 1883, pp. 40-42, fig. 10.

Konowia, g. n., Brauns, Wien. ent. Z. iii. pp. 220. Allied to *Xiphydria*. Type, *K. megapolitana*, sp. n., *ibid.*, Mecklenburg-Strelitz.

TENTHREDINIDÆ.

JACOBS, —. Tenthredinines, Céphides et Siricides des environs de Bruxelles, avec revue et description de quelques espèces des genres *Blennocampa*, Hart., *Nematus*, Jur., *Cephus*, Latr., et *Phyllæcus*, Newm., dénommées par feu le professeur Wesmael. C.R. ent. Belg. xxviii. pp. xvi.-xxxiv., cxii. & cxiv., figs.

Includes short notes on localities and larvæ.

KLUG, F. Gesammelte Aufsätze über Blattwespen. Herausgegeben von J. Kriechbaumer. Berlin: 1884, 4to, pp. 300, & col. pl.

A collected edition of Klug's papers on *Tenthredinidæ*, which were published in various old journals, now frequently difficult of access.

KONOW, F. W. Bemerkungen über Blattwespen. Deutsche E. Z. xxviii. pp. 305-354.

An important paper, including tables and observations on a great number of species (some new) belonging to the genera *Cimbex*, *Hylotoma*, *Lophyrus*, *Cladius*, *Priophorus*, *Camponiscus*, *Blennocampa*, *Pacilosoma*, *Athalia*, *Macrophya*, *Perineura*, and *Dolerus*.

List of 19 species of *Tenthredinidæ* in which parthenogenesis has been observed; Von Siebold, Ent. Nachr. x. pp. 93-95.

List of 13 additional species of *Tenthredinidæ* which are parthenogenetic; Cameron, Ent. M. M. xxi. pp. 103 & 104.

List of *Tenthredinidæ* found in the neighbourhood of Lissino: Chapochnikoff, Hor. Ent. Ross. xviii. pp. 3-10.

Hartig's synopsis of *Trichiosoma* and the *Nematidæ* reprinted from Stett. ent. Zeit. i. (1840); Kriechbaumer, Ent. Nachr. x. p. 317-326.

Cimbicinæ.

Zaræa fasciata, Linn. ♂ noticed; Osborne, Ent. M. M. xx. pp. 205-207. Parthenogenesis; *id. op. cit.* xxi. pp. 128 & 129. *Mesoleius sepulchralis*; Mulsgr., is a parasite; Bridgman, Ent. M. M. xx. p. 228.

Hylotominæ.

Hylotoma rosæ, Linn., noticed; Bull. Insect. Agric. ix. pp. 159 & 160. *H. segmentaria*, Thoms. (*nec* Panz.), = *thomsoni*, Konow, = *atrata*, Först.; Konow, Wien. ent. Z. iii. p. 277. *H. pullata*, Zadd. (♂ described), and *cyanella*, Klug, discussed; *id.* Deutsche E. Z. xxviii. pp. 309 & 310.

Phila crassula, p. 484, *nigerrima*, and *luteiventris*, p. 485, spp. nn., Cameron, Tr. E. Soc. 1884, Northern Sonora, Mexico.

Hylotoma alpina, Switzerland, p. 277, *distinguenda* [Germany ?] and *josephi*, Corfu, p. 278, Konow, Wien. ent. Z. iii.; *H. crassa*, pp. 308 & 310, and *thomsoni*, p. 309, *id.* Deutsche E. Z. xxviii., Germany: spp. nn.

Lophyrinæ.

Lophyrus abbotii, Leach, noticed as injurious to white pine, and figured, with transformations; W. Saunders, Rep. Fruit-Growers' Ass. Ont. 1882, p. 278, and 1883, p. 327, fig. 27; Rep. E. Soc. Ont. 1883, p. 57, fig. 27. *L. frutetorum*, Fabr., and *variegatus*, Hart., discussed; Konow, Deutsche E. Z. xxviii. pp. 312 & 313.

Lophyrus thomsoni (= *variegatus*, Thoms., *nec* Hart.), sp. n., Konow, Deutsche E. Z. xxviii. pp. 311 & 312, Sweden.

Nematineæ.

BRISCHKE, C. G. A., & ZADDACH, G. Beobachtungen über die Arten der Blatt- und Holzwespen: Schluss. Schr. Ges. Königsb. xxiv. pp. 121-171, pl. i. (viii.).

Includes *Nematus*, from No. 95a to 160, and treats of the groups typified by *N. pallipes*, Fall., *rufipes*, Linn., *leucopodius*, Hart., *leucogaster*, Hart., *miliaris*, Panz., and *vallisnerii*, Hart. Many new species are described, and much synonymy is given, which the Recorder, as before, has not attempted to give in detail. The plate illustrates larvæ and larval details of *Nematus miliaris*, Panz., *oligospinus*, Först., *palliatu*s, Thoms., *leucolenus*, Zadd., *fruxini*, Hart., *abietinus*, Christ, *Cryptocampus letus*, Zadd., *pentandra*, Retz., *gemma*rum, Hart., *venustus*, Zadd., and *testaceipes*, André.

Konow, Deutsche E. Z. xxviii. pp. 314-317, redescibes *Cladius pectinicornis*, Fourcr. (= *difformis*, Panz.), and *Priophorus tristis*, Zadd., ♀.

Camponiscus rufipes, Först., = *luridiventris*, Fall.; *id.* Wien. ent. Z. iii. p. 278. *C. alternipes*, Brischke, noticed as new to Britain; Billups, P. E. Soc. 1884, p. xx.

Nematus spireæ, Zadd. (larvæ described), *miliaris*, Panz. (= *fulvus*, Hart.), *xanthocerus*, Hart. (probably = *xanthopus*, Br. & Zadd., = *posticus*, Först., and not *depressus*, Hart., which probably = *subbifidus*, Thoms. & Zadd.), *melanaspis*, Hart. (= *sulphureus* and *citreus*, Zadd.), and *perispicillaris*, Hart. (= *melanocephalus*, De Geer, but not *pavidus*, Lep.), discussed; Kriechbaumer, CB. Ver. Regensb. xxxiii. pp. 106-112. *N. westermanni*, Dahlb. (= *scotaspis*, Först.), and *nigriceps*, Hart. (= *striatus*), Thoms., discussed; Von Stein, Ent. Nachr. x. pp. 96-100. *N. miliaris*, Panz., and allies: synonymy discussed; *id.* t. c. pp. 349-354. *N. xanthopus*, André and Brischke & Zaddach, = *Dineura stilata*, Klug; Cameron, Ent. M. M. xx. p. 265. *N. politus* and *commixtus*, Zadd., = *leucostigmus* and *nigrolineatus*, Cam., respectively; *id.* op. cit. xxi. p. 26. *N. curtispina*, Thoms. [*vide* POULTON, E. B., Insecta, General Subject;

antea, p. 8]. *N. erichsonii*, Hart. : life-history and ravages in America ; Packard, Am. Nat. xviii. pp. 293-296, figs. 1 & 2, Moffat & Fyles, Canad. Ent. xvi. pp. 215 & 216. *N. pentandra*, Retz., and allies, noticed ; Ent. Tidskr. v. pp. 96, 97, & 206. *N. ribesii*, Schrank, noticed ; Andersson, Ent. Tidskr. v. pp. 185 & 186 : said to attack black currant in Scotland ; * Dundee Advertiser (cf. P. E. Soc. 1884, p. xix.).

New species :—

Cladius crassicornis and *gracilicornis*, Konow, Deutsche E. Z. xxviii. p. 314, Germany.

Camponiscus luridus and *braunsii*, *id. t. c.* p. 318, Germany. (The latter = *apicalis*, Brischke ; *id.* Wien. ent. Z. iii. p. 279.)

Nematus glaphyropus, Z., Southern Alps, *pruni*, Z., Königsberg, p. 124, *obscurus*, Z., Danzig, Königsberg, p. 126, *tener*, Z., Danzig, *rusticanus*, Z., Königsberg, p. 128, *erythropareus*, Z., Innsbruck, p. 130, *xanthostylos*, Z., Königsberg, p. 131, *leucodous*, Z., Wohlfr.-Zinten, p. 132, *melanodus*, Z., Andersch, p. 133, *platyceros*, Z., Germany, Austria, Scotland, Sweden, p. 136, *nanus*, Z., Andersch, *serotinus*, Z., Königsberg, p. 137, *xanthomus*, Z., Lüneburg, *cellularis*, B., Danzig, p. 138, *melanostomus*, Z., p. 140, *athlops*, Z., Bautzen, p. 141, *agilis*, Z., Andersch, *catulus*, Danzig, p. 142, *cheilon*, Z., Danzig, Silesia, p. 145, *festivus*, Z., Königsberg, p. 146, *crategi*, B., *laricivorus*, B., Danzig, p. 147, *semilacteus*, Z., Königsberg, p. 148, *chlorogaster*, Z., Germany, Austria, Sweden, p. 149, *bufo*, B., Zoppot, p. 150, *hypobatus*, Z., Hungary, p. 154, *dispar*, Z., Holland, Germany, p. 161, *anthophilus*, Z., p. 163, *prussicus*, Z. (? = *leucopsis*, Tischb.), Königsberg, p. 166, *politus*, Z., Germany, Scotland, p. 167, *bellus*, Z., Königsberg, p. 170, *elegans*, Z., *sieboldii*, Z., Danzig, p. 171, and *pumilus*, Z., Insterbürg, p. 172, Brischke & Zaddach, Schr. Ges. Königsb. xxiv. ; *N. ensicornis* and *testaceicornis* (Wesm., MSS.), Jacobs, C.R. ont. Belg. xxviii. p. xxiii., Belgium ; *N. thalictri*, Kriechbaumer, CB. Ver. Regensb. xxxviii. p. 105, Munich ; *N. collaris*, Von Stein, Ent. Nachr. x. p. 305, Chodau ; *N. orbitalis*, Scotland, Germany, p. 265, *sylvestris*, Britain, p. 266, Cameron, Ent. M. M. xx., *fletcheri*, England, Scotland, p. 26, and *purpurea*, Worcester, p. 80, *id. op. cit.* xxi. ; *N. mexicanus*, *id.* Tr. E. Soc. 1884, p. 481, Northern Sonora, Mexico.

Euura mexicana, *id. t. c.* p. 482, Northern Sonora.

Hemichroa nigricans, *id. ibid.*, Northern Sonora.

Selandriinæ.

Blennocampa alternipes, Klug, mentioned as new to Britain ; Billups, P. E. Soc. 1884, p. xx. *B. aucta*, Thoms., = *lioparea*, Konow, probably = *tenuicornis*, Klug (*nec* Hart.) ; Wüstnei & Konow, Wien. ent. Z. iii. p. 279. *B. melanopygia*, Costa, noticed ; Failla-Tedaldi, * La Sicilia Agricola, ii. [1884] (cf. Bull. Ent. Ital. xvi. p. 146).

Monophadnus viridis, Kalt. Supposed larva described ; De Kerville, Bull. Soc. Ent. Fr. (6) iv. pp. ciii.-cv.

Eriocampa limacina, Retz. : habits and metamorphoses ; * Gadeau de Kerville, Mém. ent. ii. pp. 13-19. *E. soror*, Voll., noticed as new to France, and destructive to roses ; André, Bull. Soc. Ent. Fr. (6) iii. p. xc.

denta, p. 305,

Selandria barda, Say: life-hist., *cit.* ix. p. 39, pl. iii. figa; *O. hituense*, remedies; Osborne, Canad. Ent. xv p. 119, pl. viii. fig. 1, 1.
 Peck: habits, ravages, &c., discussed; *Forbes*, *Rep. Ins. Illin.* xii. pp. 98-100, figs. 18 & 19, and Weed, Cook's Pract. Ent. pp. 29-31, figs. 13 & 14. *S. rubi*, Harr., noticed; W. Saunders, Canad. Ent. xvi. p. 209.

Blennocampa flavicollis (Wesm., MS.), Jacobs, C.R. ent. Belg. xxviii. p. xxviii., Belgium; *B. lioparea* (= *aucta*, Thoms., *nec* Klug), Sweden, Germany, and *divisa*, Mecklenburg. Konow, Deutsche E. Z. xxviii. p. 319; *B. bicolorata*, Cameron, Tr. E. Soc. 1884, p. 483, Mexico: spp. nn.

Emphytinae.

Pacilosoma pulveratum, Ratz. (= *obesum*, Klug), *candidatum*, Fall. (= *repandum*, Klug), *immersum*, Klug (= *obtusa*, Thoms.), *guttatum*, Fall. (= *impressum*, Klug), and other species discussed; Konow, Deutsche E. Z. xxviii. pp. 319-323.

Pacilosoma carbonarium (Scop. ?), sp. n., *id.* t. c. p. 322, Germany.

Strongylogaster rogenhoferi and *fumipennis*, spp. nn., Cameron, Tr. E. Soc. 1884, pp. 483 & 484, Mexico.

Dolerinae.

Dolerus. The following species are redescribed by Konow, Deutsche E. Z. xxviii. pp. 347-354:—*palmatum*, Klug, *pratensis*, Linn. (= *eglantaria*, Klug), and var. *nigricans*; *arcticus*, Thoms., *palustris*, *uliginosus*, *madidus*, *timidus*, *desertus*, *dubius*, *tristis*, Klug, *varispinus*, Hart., *fumosus* and *incertus*, Zadd., *brevitarsus* and *aneus*, Hart. (= *brevicornis*, Zadd.). Konow also (Wien. ent. Z. iii. pp. 279-281) discusses or re-describes *D. carinatus*, Kon. (= *crassus*, Kon.), *madidus*, Klug (= *lateritius*, auct.), *lamprechtii*, Kon., *varispinus*, Hart., *leucopterus* and *asper*, Zadd. *D. lateritius*, Klug (= *Tenthredo germanica*, Fabr.), discussed; Von Stein, Ent. Nachr. x. pp. 102-105. *D. pratorum*, Fall. (= *equiseti*, Klug), recorded as new to Britain; Cameron, Ent. M. M. xx. p. 265.

Dolerus trigeminus (= *palmatum*, Thoms., *nec* Klug), p. 346, *mandibularis*, p. 347, *lamprechtii*, *thomsoni* (= *brevicornis*, Thoms., *nec* Klug), p. 349, *schmidtii*, p. 350, *raddatzii*, p. 351, *carinatus* and *crassus*, p. 353, Konow, Deutsche E. Z. xxviii., Germany; *D. rugosus*, *id.* Wien. ent. Z. iii. p. 281 [Germany?]; *D. quadrinotatus*, Biro, Rov. Lapok, i. p. 57, Hungary: spp. nn.

Athaliinae.

Athalia rosae, Linn., occurs in two well-marked varieties, for which the names *immaculata* and *obscura* are proposed; Konow, Deutsche E. Z. xxviii. p. 323.

Athalia maritima, sp. n., Kirby, Ent. M. M. xx. p. 215, Greece.

Tenthredininae.

KRIECHBAUMER, —. Ueber die Blattwespengattungen *Perineura*, *Tenthredopsis*, und *Ebolia*. CB. Ver. Regensb. xxxviii. pp. 9-17.

The genera and their synonymy are discussed, and 3 new species of *Tenthredopsis* are described.

Tenthredopsis dorsalis, Spin. (= *Tenthredo histrio*, Klug), and *ornata*, Lep. (= *Tenthredo neglecta*, ♂, Lep., and *Perineura excisa*, Thoms.), discussed; Von Stein, Ent. Nachr. x. pp. 356-358.

Taxonus glabratus, Linn., and *Tenthredo mandibularis*, Fabr. Abnormal neuration; Jacobs, C.R. ent. Belg. xxviii. pp. cxiii. & cxiv, figs.

Macrophya albicincta, Thomson, is probably only a var. of *albicincta*, Schrank (= *ribis*, Thoms.); var. *decipiens* from Thuringia described: Konow, Deutsche E. Z. xxviii. pp. 325 & 326.

Tenthredo velox, Fabr., and *bipunctula*, Klug, fully redescribed and differentiated; Von Stein, Wien. ent. Z. iii. pp. 309-313. *T. pallicornis*, Fabr. (= *vespiformis*, Schrank, and *vespoides*, Lep.), discussed; *id.* Ent. Nachr. x. pp. 100-102.

New genera and species :—

Thomsonia, Konow, Deutsche E. Z. xxviii. p. 327. Includes the bulk of *Perineura*, Thoms. (*nec* Hart.) [and appears to = *Tenthredopsis*, Costa]. The species are tabulated, and the following specially noticed: —*Tenthredo nassata*, Linn., *dorsalis*, Lep. (= *sordida*, Thoms.), and *scutellaris*, Panz.; and *nassata*, Thoms. (*nec* Linn.), is renamed *thomsoni*. The following new species are described:—*T. obscura*, p. 333, *laticeps* and *raddatzii*, p. 334, *elegans*, *friesei*, and *braunsii*, p. 335, all from Germany; add *T. josephi*, Altvater, and *hilleckii*, Rosstrappe, spp. nn., *id.* Wien. ent. Z. iii. pp. 307 & 308.

Rhogogaster, *id.* Deutsche E. Z. xxviii. p. 338. Allied to *Tenthredo*. To include *T. insignis*, Klug, *solitaria*, Schrank (= *ancupariæ*, Klug), *lateralis*, Fabr., *picta*, Klug, *viridis*, Linn., Thoms. (= *scalaris*, Thoms.), and *punctulata*, Klug.

Macrophya friesei and *parvula*, *id. t. c.* pp. 325 & 326, Germany.

Tenthredopsis semirufa, p. 15, *limbilabris* and *conjungens*, p. 17, Kriechbaumer, CB. Ver. Regensb. xxxviii., Spain; *T. opacipleuris*, Corfu, and *wuestnei*, Prague, Von Stein, Ent. Nachr. x. pp. 301 & 354.

Tenthredo alpicola, *id. t. c.* p. 303, Salzburg.

LEPIDOPTERA.

BY

W. F. KIRBY, F.E.S., &c.

THE GENERAL SUBJECT.

AARON, E. M. A Question of Priority. *Papilio*, iv. pp. 131-134.

W. H. Edwards and H. Strecker described several butterflies almost simultaneously in 1876-77; and Aaron argues that the former writer has priority.

BERTKAU, P. Ueber Duftvorrichtungen einiger Schmetterlinge. *Verh. Ver. Rheinl.* xli. pp. 343-350.

Discusses Haase's paper (*vide infra*).

BOCK, H. VON. Schutzfarben unserer einheimischen Lepidopteren, ihrer Eier, Raupen und Puppen. *B. E. Z.* xxviii. pp. 217-224.

BOWLES, C. J. Remarks on the Family *Bombycidae*. *Canad. Ent.* xvi. pp. 152-156.

Consists of general observations on the various subfamilies admitted by Packard, and on the present uncertainty regarding the classification of the group.

BUTLER, A. G. The *Lepidoptera* collected during the recent Expedition of H.M.S. 'Challenger,' Part ii. *Ann. N. H.* (5) xiii. pp. 183-203.

74 species enumerated (some new), chiefly from the West Indies and the Eastern Archipelago.

CHOLODKOWSKY, N. Ueber die Hoden der Lepidopteren. *Zool. Anz.* xli. pp. 564-568.

The writer has examined these organs in 150 species, and has ascertained that they occur in four different systems, which he names and defines as follows:—

(1.) Embryonal type. Two testes, with the seminal follicles quite separate.

- (2.) Larval type. Two testes, in which four follicles are invariably enclosed by a common membrane.
- (3.) Pupal type (first observable in the pupa state). A single testis, constricted externally in the middle.
- (4.) Imaginal type. A single testis, not constricted, in which the follicles are mostly arranged round its longitudinal axis. (The last arrangement is that met with in the majority of the species examined.)

[CHOLODKOWSKY, N.] Sur les vaisseaux de Malpighi chez les Lépidoptères. C.R. xcvi. pp. 631-633.

Tineola biselliella, Humm., and *Blabophanes rusticella*, Hübn., have only two Malpighian vessels. All other known *Lepidoptera* have six, both in the larva and imago; Suckow's statement that *Pterophorus pentadactylus* and *Hyponomeuta evonymella*, Linn., had only four, being erroneous. Cholodkowsky supposes that the (at present unexamined) larvæ of the 2 exceptional species will prove to have six, and that the two vessels of the imago are neomorphs; also that the ancestral *Insecta* had only two.

— Contributions à l'anatomie et la morphologie des vaisseaux malpighiens des Lépidoptères. C.R. xcix. pp. 816-819.

After tracing the changes of these organs in the larva of *Tineola biselliella*, the writer proceeds to consider their structure in other *Lepidoptera*. Three types exist:—

- (1.) Normal type. Six vessels (the most frequent arrangement in nearly all *Lepidoptera*.)
- (2.) Embryonic type. Two vessels; occurring in *Tinea pellionella*, Linn., and *Blabophanes rusticella*, Hübn.
- (3.) Abnormal type. Vessels forming a ramifying tree on each side. Example:—*Galleria cereana*, Linn.

EDWARDS, W. H. Notes on Butterflies, with directions for breeding them from the egg. Canad. Ent. xvi. pp. 81-89 & 109-117.

Contains much important information relating to eggs, oviposition, &c.

— Further Experiments upon the Effect of Cold applied to the Chrysalids of Butterflies. T. c. pp. 232-236.

Relates to various species; *Melitæa harrisii*, Scudd., is most fully discussed.

FERNALD, C. H. Directions for Collecting, Preserving, and Transporting Tortrices and other small Moths. P. U. S. Nat. Mus. vii. pp. 577-579.

FOCKE, W. O. Nägeli's Einwände gegen die Blumentheorie, erläutert an den Nachtfalterblumen. Kosmos, xiv. pp. 291-302. (Cf. also Breitenbach, op. cit. xv. p. 80.)

Discusses various views put forward in Nägeli's "Mechanisch-physiologische Theorie der Abstammungslehre."

HAASE, E. Ueber sexuelle Charaktere bei Schmetterlingen. Z. E. Ver. schles. ix. pp. 15-19, figs. 1 & 2. (Cf. Ent. Nachr. x. pp. 328 & 329.)

Relates to the abdominal pouches and tibial tufts of the males of *Acherontia* and *Catocala*.

KIRBACH, P. Ueber die Mundwerkzeuge der Schmetterlinge. Arch. f. Nat. l. pp. 78-119, pls. v. & vi.

GOOSSENS, T. Les Œufs des Lépidoptères. Ann. Soc. Ent. Fr. (6) iv. pp. 129-146, pl. v.

Deals with fertilization of eggs of *Lepidoptera*, their shape, colour, and lustre, the influence of temperature, means of protection, parthenogenesis, &c.; and concludes with short notices of various eggs belonging to different families of *Lepidoptera*, those of 42 species being figured.

LINTNER, J. A. A New Sexual Character in the Pupæ of some *Lepidoptera*. Psyche, iv. pp. 103-106.

In the males of at least some *Cossina* and *Ægeriida*, there are two rows of teeth on segments 5-10 inclusive, and in the females only on segments 5-9. Moreover, other variations in the armature of *Cossus* are of specific value.

* MILLIÈRE, P. Lépidoptérologie: 8^e fascicule. 8vo, pp. 27, plate.

MÖSCHLER, H. B. Die Behandlung der für Sammlungen bestimmten Schmetterlinge und ihre Erhaltung. S. E. Z. xlv. pp. 105-108. (Cf. also Rössler, t. c. p. 144, and Ent. Nachr. x. pp. 61-65.)

NUSBAUM, J. Bau, Entwicklung, und morphologische Bedeutung der Leydig'schen Chorda der Lepidopteren. Zool. Anz. vii. pp. 17-21, figs. 1 & 2.

The structure and development of Leydig's chord and the adjacent parts in *Bombyx mori* are described. It is to be regarded as a mesoskeleton, analogous to, but not homologous with, the chorda dorsalis of *Vertebrata*. In *Arthropoda* as well as in *Vertebrata* we can distinguish two morphologically different parts in the internal skeleton—(1) An entoskeleton (the entodermal chorda and its products); and (2) a mesoskeleton (Leydig's chorda).

OBERTHÜR, C. Études d'Entomologie. Faunes Entomologiques. Descriptions des insectes nouveaux ou peu connus. 8^{me} livr., Juin, 1884, Lépidoptères des Pyrénées, pp. 53, pl. i.; 9^{me} livr., Août, 1884, Lépidoptères du Thibet, de Mantschourie, d'Asie-Mineure et d'Algérie, pp. 40, pls. i. & ii.; 10^{me} livr., Octobre, 1884, Lépidoptères de l'Asie orientale, pp. 35, pls. i.-iii.

POULTON, E. B. [Vide *Insecta*, General Subject, *antea*, pp. 7 & 8.]

ROSENSTOCK, R. On the Synonymy of Heterocerous *Lepidoptera*. Ann. N. H. (5) xiv. pp. 63-65.

Points out the identity of upwards of 30 species of *Noctuæ*, *Pyrales*, and *Geometræ* described by Walker, with others previously described either by Walker or Guénéé.

SCHILDE, J. Frühlingsbeobachtungen über die naturimmanente Erzeugung der Flügelpracht und Anpassung von Schmetterlingen. Ent. Nachr. x. pp. 141-148.

The author strongly disputes the theory of protective colouration having originated either by natural or sexual selection, and believes that *Lepidoptera* rarely if ever pair before more or less of their beauty is impaired.

STAUDINGER, O. Exotische Schmetterlinge. Abbildungen und Beschreibungen der wichtigsten exotischen Tagfalter in systematischer Reihenfolge, mit Berücksichtigung neuer Arten, von O. Staudinger, unter technischer Mitwirkung von H. Langhans. Mit gegen 1500 colorirten Abbildungen auf 120 Tafeln. 1-6 Lieferungen, pp. 1-38, pls. i.-xxx. Furth (Bavaria): fol., 1884.

To be completed in 24 parts. Those already published extend to *Catopsilia* (text) and *Tithorea* (plates), the latter being consequently a little in advance. A large number of species, including a fair series of representatives of all the principal genera, are described and figured. Many of these have not been previously figured, and some are new. The latter only will be specially noticed here. Many species besides those figured are incidentally noticed in the text. The figures on the plates are not numbered, which is an oversight; but as the name is printed below each species, this omission is of less consequence.

WAILLY, A. Notes on Exotic *Lepidoptera* reared in 1883. Ent. xvii. pp. 28-33 & 103-107.

Relates to *Attacus cecropia*, *polyphemus*, and *promethea*, *Actius luna*, *Hyperchiria io*, *Ceratocampa (Eacles) imperialis*, *Dryocampa (Anisota) rubicunda*, *Orgyia leucostigma*, *Hemaris tenuis* (?), *Apatura clyton*, *Limenitis disippus*, *Darapsa myron*, *Antheraea royllyi* and *pernyi* (hybrids), *Attacus cyathia*, *Actias selene*, *Att. atlas*, *Anth. mylitta (paphia)*, and *Samia cecropia* (aberration ?).

WALTER, A. Palpus maxillaris Lepidopterorum. Jen. Z. Nat. xviii. pp. 121-173.

The maxillary palpi of 101 species are described. They are obsolete in some species, but are usually from 1 to 6-jointed. *Micropteryx* has six joints, and the number in the *Micro-Lepidoptera* is variable. In the *Crambidae* and *Botyridae* they are 4-jointed; in the *Noctuae* they are generally 2-, but sometimes 3-jointed; in the *Bombyces* they are 2- or 1-jointed; and in the *Rhopalocera*, *Sphinges*, and most of the *Geometridae*, they are 1-jointed. Although in different species the maxillary palpi vary much in position and in the character of their appendages, as well as in the number of joints, yet all these characters are perfectly constant within the same species.

ZIMMERMANN, C. Die Variabilität der Schmetterlinge in ihren verschiedenen Entwicklungsstadien und der biologische Werth von Form, Farbe und Zeichnung. Verh. Ver. Hamb. v. pp. 58-61 & 66-68.

Deals chiefly with larvæ.

After numerous observations on the oviposition of *Lepidoptera*, Standfuss (S. E. Z. xlv. p. 210) has arrived at the following conclusions:—(1.) The sex is determined by the structure of the ovaries, and is unaffected by fertilization. (2.) Male and female eggs are not laid indiscriminately, but successively, commencing with a series of male eggs. (3.) The number of male and female eggs laid by one female is usually about equal, but with a slight excess in favour of the ♂. (4.) These rules, especially 1 and 3, probably hold good very extensively in the animal kingdom.

Note on exotic *Lepidoptera* received during 1878; Crüger, Verh. Ver. Hamb. v. pp. 85–93.

Remarks on variation, dimorphism, &c., in butterflies; Meldola, Tr. Ess. Club, iii. pp. lxxxv. & lxxxvi.

The following hermaphrodites in the Hungarian National Museum are noticed by Mocsáry, Rov. Lapok, i. pp. 55–57 & vii.:—*Pieris duplidice*, *Epinephile janira*, Linn., *Trochilium apiforme*, Clerck, *Ino ampelophaga*, Bayle, *Leucoma salicis*, *Ocnaria dispar*, Linn., *Saturnia pyri*, W.V., *S. pavonia* and *Harpyia vinula*, Linn.

On the influence of meteorological conditions upon *Lepidoptera*; De V. Kane, Ent. xvii. pp. 25–28.

Influence of a mild winter on the appearance of *Lepidoptera*; Waters, Ent. xvii. p. 164.

Dates of hibernation of various *Lepidoptera*; Gauckler, Ent. Nachr. x. pp. 112 & 113.

Plusia gamma, Linn., and *Hybernus defoliaria*, Clerck, and *aurantiaria*, Esp., migrating; Cordeaux, Ent. M. M. xxi. p. 30.

Effect of temperature upon larvæ; Aaron, Tr. Am. Ent. Soc. xi. p. xxxii.

Note on hibernation of various Lepidopterous larvæ; Zimmermann, Verh. Ver. Hamb. v. p. 84.

On the time of emergence from the cocoon, and duration of the larva state in various *Lepidoptera*; Standfuss, Z. E. Ver. schles. (2) ix. pp. 64–68.

On retarded emergence in *Lepidoptera*; Wright, Ent. xvii. pp. 108 & 109.

Effect of artificial light and moonlight upon moths; Campbell, Tr. Hertf. Soc. iii. pp. 132–135.

Mimicry in an undetermined pupa from Porto Alegre; Breitenbach, Kosmos, xiv. p. 208, fig.

Notes on the contagious diseases of caterpillars and other insects; Forbes, Rep. E. Soc. Ont. 1883, p. 19.

List of Hymenopterous parasites on *Lepidoptera*; Fitch, Ent. xvii. pp. 67–69.

Butterflies in Finland attacked by dragonflies; Schiide, Ent. Nachr. x. pp. 6–9.

Various species of *Sphingidæ*, *Cucullia*, and *Plusia* captured by flowers of *Oenothera speciosa*; Wolfensberger, MT. schw. ent. Ges. vii. pp. 5–7; (flower figured) Kosmos, xv. pp. 239 & 240, fig.

Physianthus albens capturing *Lepidoptera* by the proboscis, in S. Africa; Fry, Ent. xvii. pp. 71 & 72.

Notes on moths injurious to vegetation; Grote, Canad. Ent. xv. pp. 235 & 236.

List of oak-feeding *Lepidoptera* (continued), *Cymatophoridae* to end; Mina-Palumbo, Nat. Sicil. iii. pp. 120-124, 184-186, 247, 248, 298-300, 323, 324, 347, & 348, iv. pp. 16-20.

Injury to oaks by caterpillars; Gard. Chron. (2) xxii. p. 114.

Ravages of undetermined *Micro-Lepidoptera* in mills; C.R. ent. Belg. xxviii. p. cxi.

Action of ammonia and of cyanide of potassium upon some *Lepidopterous* pigments: Coverdale, Nature, xxx. p. 571, and Ent. xvii. pp. 204-206; Baker, Ent. M. M. xxi. p. 66.

On the cremaster of *Lepidopterous* pupæ; Lehmann, Z. E. Ver. schles. (2) ix. pp. 24-26.

On preserving larvæ: Smith, Putnam, & Cramer, Bull. Brooklyn Soc. vii. pp. 68 & 93-95; Oudemans, Tijdschr. Ent. xxvii. pp. xvi. & 5-8, pl. i. On preserving larvæ and pupæ with chromic acid; Cameron, P. Glasg. Soc. v. pp. 289 & 290.

Forcing pupæ of moths; Fischer, Canad. Ent. xvi. p. 16.

On collecting nocturnal *Lepidoptera* with honey and a lantern; Lo-deesen, Tijdschr. Ent. xxvii. pp. 1-4.

Killing *Lepidoptera* by injections; Worthington & Blake, Papilio, iv. pp. 41 & 193.

On setting *Lepidoptera* uninjured; Coverdale, Ent. xvii. pp. 131-133.

New method of transferring the scales of *Lepidoptera* to paper; Milani & Garbini, Zool. Anz. vii. pp. 276-278, and Bull. Ent. Ital. xvi. pp. 293 & 294. On denuding wings of *Lepidoptera*; Hulst, Papilio, iv. p. 62. On examining scales of butterflies under a microscope; Slack, Knowledge, vi. p. 271.

On the prevention of grease in *Lepidoptera*; Kittsteiner, Z. E. Ver. schles. (2) ix. pp. 20 & 21.

Hairy larvæ can probably only be attacked by parasites under favourable conditions, and their pupæ are probably more exposed to attack; Clarkson, Canad. Ent. xvi. pp. 53 & 54.

Larvæ dropping to the ground to avoid the attacks of *Tachinæ*; Keen, Canad. Ent. xvi. p. 100.

Dipterous parasites on *Lepidoptera* discussed; Nature, xxxi. pp. 29, 54, 82, & 103.

On certain methods of judging and describing new species; Aaron, Papilio, iv. pp. 49-52.

Controversy between Elwes & Butler, relating to various species of butterflies; Papilio, iii. pp. 151-155, and iv. pp. 39, 40, & 113.

On capitalizing specific names; C. V. Riley & H. Edwards, Papilio, iii. pp. 164-166, and iv. pp. 34 & 35.

Notes on Harper's collection of *Lepidoptera*: Carrington, Ent. xvii. pp. 88 & 89; Dohrn, S. E. Z. xlv. pp. 302-304; Oberthür, Bull. Soc. Ent. Fr. (6) iv. pp. lxii. & lxiii.

Notes on Strecker's collection; Aaron, Papilio, iv. p. 42.

on the date of Hübner's works; Ent. Nachr. x. pp. 197-201.

Obituary notice of W. Buckler, with an account of his work, and list of Lepidopterous larvæ described by him; Stainton & Hellins, *Ent. M. M.* xx. pp. 229-236.

FAUNÆ.

Europe.

JORDAN, R. C. R. On the European species of *Lepidoptera* with apterous or subapterous females. *Ent. M. M.* xx. pp. 219-221.

KANE, W. F. DE V. Variation of European *Lepidoptera*. *Ent.* xvii. pp. 97-102; *Naturalist* (2) x. pp. 73-84.

A suggestive paper dealing with the subject from many points of view.

LANG, H. C. *Rhopalocera Europæ descripta et delineata*. The Butterflies of Europe described and figured. London: 8vo, 1884, i. text, pp. vii. & 396, and ii., plates, pp. xii., pls. lxxxii. (*Cf.* *Ent.* xvii. pp. 284-287, and *Nature*, xxxi. pp. 122 & 123.)

This important work has now been completed by the publication of parts xvi.-xx. Several species, apparently new, from various extra-European parts of the Palearctic Region, are briefly described under Staudinger's MS. names. The work is well indexed, and a fairly good bibliography is appended.

British Islands.

HOFFMANN, A. *Lepidopteren von den Shetland-Inseln, mit Notizen über das Vorkommen der Arten in anderen nordischen Ländern, auf nord- und mitteldeutschen Gebirgen und in den Schweizer Alpen*. *S. E. Z.* xlv. pp. 353-375.

63 species noticed in more or less detail. The fauna has but little specially northern character, but seems rather to form the northern limit of the Central European fauna, and to indicate that the Shetlands were originally united to Scotland.

KANE, W. F. DE V. Report on Irish *Lepidoptera*. *P. R. Irish Ac.* (2) iv. pp. 105-115.

The author discusses many new, rare, or aberrant Irish *Lepidoptera*, and comes to the conclusion that the Irish fauna, as at present existing, derives its origin from a period anterior to the separation of the British Isles from the Continent.

SOUTH, R. The Entomologist Synonymic List of British *Lepidoptera*. London: 1885, 8vo, pp. viii. & 40.

Designed to form a modern substitute for Doubleday's "List." Carrington tabulates the variations; *Ent.* xvii. pp. 289-304. For other notices, *cf.* *Ent.* xvii. pp. 212-216, 239, & 240, and *Naturalist* (2) x. pp. 117 & 118.

WEIR, J. J. The *Macro-Lepidoptera* of Unst. *Ent.* xvii. pp. 1-4, pl.; *S. E. Z.* xlv. pp. 186-188. (*Cf.* also Briggs, *Ent.* xvii. pp. 197-201.)

32 species (out of 44 known to inhabit the Shetlands) were taken by McArthur in Unst, the most northern island. Many of these are remark

able varieties. The following species are specially noticed:—*Pyrameis cardui* and *Vanessa atalanta* (the only butterflies), *Hepialus humuli* var. *hethlandica*, *H. eskeda*, *Noctua festiva*, figs. 8–10, *glareosa*, fig. 1, *xanthographa*, *Hadena exulis*, figs. 5–7 (Rannoch form, fig. 4), *Agrotis cursoria*, figs. 2 & 3, *porphyrea*, *lucernea*, *Pachnobia hyperborea*, *Dianthæcia conspersa*, *Aplecta occulta*, *Dasypolia templi*, *Emmelesia albulata* var. *thalea*, *Eupithecia venosata*, *nanata*, *Melanippe montanata*, *Camptogramma bilineata*, and *Cidaria immanata*.

WHEELER, F. D. A Week on the "Broads." Ent. M. M. xxi. pp. 165–174.

Relates to collecting *Lepidoptera* in the Norfolk Broads.

Increasing scarcity of *Lepidoptera* in Britain; P. E. Soc. 1884, pp. iii.–v. Attributed to the increase of birds; Frohawk, Ent. xvii. pp. 37–39.

Abundance of caterpillars in Wales in 1884; Ent. M. M. xxi. pp. 63–66.

"Results of twenty years' observations on Botany, Entomology, Ornithology, and Meteorology, taken at Marlborough College, 1865–84;" includes the earliest dates in each year on which *Macro-Lepidoptera* were observed.

Notes on some *Micro-Lepidoptera* reared in captivity; Elisha, Ent. xvii. pp. 201–203.

Hudd has continued his list of the *Lepidoptera* of the Bristol District; P. Bristol Soc. iii. [1882] pp. 42–49 (contains Part iii., *Noctuidæ*).

List of *Lepidoptera* of West Cumberland; Tr. Cumberland Ass. viii. [1883] pp. 55–67.

Observations on *Lepidoptera* at Cambridge and Reading; Waters & Holland, Ent. M. M. xx. p. 226, and xxi. pp. 157–159.

Notes on *Lepidoptera* of Roxburghshire; Elliot, * P. Berwick Club [cf. Scot. Nat. (2) i. pp. 201 & 202].

List of *Lepidoptera* (except *Tineina*) observed at Sanbridge, Herts; Griffith, Tr. Hertf. Soc. iii. pp. 58–66.

Account of Rannoch, with casual remarks on the *Lepidoptera*; Carrington, Ent. xvii. pp. 145–153.

List of butterflies of Sussex; Weir, Ent. xvii. pp. 39 & 40. Hunting-doushire; additions: Norris, Ent. xvii. pp. 64 & 65.

Lepidoptera bred from *Myrica gale* in Norfolk; Atmore, Ent. M. M. xx. pp. 188 & 189.

Captures of British *Lepidoptera* are announced in the following localities, among others:—Witherslack (cf. also pp. 165 & 166), Nottingham, Muirhead Valley, Somerset, and Cambridge, pp. 4–16, West Norfolk, Abbot's Wood, and Eastbourne, pp. 33–37, Cos. Derry and Donegal, pp. 57–62, South London, pp. 63, 64, 89–91, 139 & 140, Kent (coast), pp. 136–139, Charmouth, pp. 210–212, Rannoch, pp. 228–230, Lynmouth, N. Devon, pp. 241–247, Ent. xvii.; Isle of Man, Ent. M. M. xx. p. 216; Bingley District and Burnt Wood, Staffordshire, Naturalist (2) ix. pp. 100, 101, 189 & 190, &c., &c.

France, Italy, and Portugal.

BERCE, E. Histoire naturelle de la France. 12^e partie, Faune des Lépidoptères. Paris : 1884, 8vo, pp. ix. & 235, pls. A & xxv. (*Cf.* Le Nat. vi. p. 479.)

A posthumous work. Although greatly compressed, it contains much matter and many illustrations not to be found in Berce's larger work on the same subject.

TURATI, G. Note Lepidotterologiche sulla Fauna italiana. Bull. Ent. Ital. xvi. pp. 68-87.

Chiefly of local interest.

Captures of *Lepidoptera* in the Department of the Gironde ; Act. Soc. L. Bord. xxxvii. pp. l., lxxii., & lxxiii.

List of *Lepidoptera* of Portugal, with localities and times of appearance, &c., and table of general distribution ; Santos, J. Sci. Lisb. x. pp. 29-42 & 121-148.

Captures of *Lepidoptera* in Sicily ; Leech, Ent. xvii. p. 135.

List of Sphinges, Bombyces, *Noctua*, and *Geometra* collected by Kalchberg in Sicily ; Riggio, Nat. Sicil. iv. pp. 49-54.

Central Europe.

FUCHS, A. Macrolepidopteren des unteren Rheingaaues und der angrenzenden Gebirgslandschaft. S. E. Z. xlv. pp. 241-270.

25 species discussed, which will be noticed in their places.

FREY, H. Dritter Nachtrag zur Lepidopteren-Fauna der Schweiz. MT. schw. ent. Ges. vii. pp. 10-26.

91 species mentioned, the most important of which will be noticed in their places.

HOMÉYER, A. v. Vorkommen und Verbreitung einiger Macrolepidopteren in Vorpommern und Rügen. S. E. Z. xlv. pp. 417-442.

Short observations (not requiring further notice) on 202 species.

MANN, J. Beiträge zur Kenntniss der Microlepidopteren-Fauna der Erzherzogthümer Oesterreich ob und unter der Enns und Salzburgs. Wien. ent. Z. iii. pp. 172-176, 193-196, 225-228, 273-276, & 303-306.

The portion already published extends to *Eudemis*.

* PABST, M. Die Gross-Schuppenflügler (*Macro-Lepidoptera*) der Umgegend von Chemnitz und ihre Entwicklungsgeschichte. 1ster Theil. *Rhopalocera*, *Heterocera* (Sphinges, Bombyces). Chemnitz 1884, 4to, pp. 50.

Notes on *Lepidoptera* observed during an Alpine tour in 1883 ; most of the high Alpine larvæ are either black or yellow : Baker, Ent. M. M. xx. pp. 7-13.

Captures of butterflies (55 species) at Carlsbad ; Becher, Ent. xvii. pp. 74-81.

* Contributions to the Lepidopterous fauna of Cassel; Knatz, Ber. Ver. Cassel, xxix. & xxx.

Additions to the list of *Lepidoptera* of the lower Elbe; Sauber, Verh. Ver. Hamb. v. pp. 93-96, 99-103, 176. & 177.

List of the rarer *Lepidoptera* of Presburg; Kempelen, Rov. Lapok, i. pp. 94-99, xi., & xii.

Additions to the Lepidopterous Fauna of the Rechberg, to the *Geometrae* inclusive, raising the list to 651 species, 22 varieties, and 48 aberrations: Riggenbach-Stehlin, MT. schw. ent. Ges. vii. pp. 46 & 47.

Observations on Silesian *Lepidoptera*; Möschler & Wocké, Z. E. Ver. schles. (2) ix. pp. xxxi. & 28-63.

Posthumous notes by Zeller on localities for *Lepidoptera* at Stettin; S. E. Z. xlv. pp. 346-350 & 413-416.

An entomological excursion to the Wendelstein (relating to *Lepidoptera*); Von Gumpfenberg, S. E. Z. xlv. pp. 66-70.

Third Supplement to the list of *Lepidoptera* of the Lavant Valley, and of the "Kor- u. Sauer-alpe"; Höfner, JB. Mus. Kärnten, xvi. pp. 162-176.

List of *Lepidoptera* of Nowego Sacza; Klemensiewiczza, Sprawozd. Kom. Fizyogr. xvii. pp. 200-225.

Scandinavia.

*RUDOLPHI, J. Skandnaviens Fjärilar. Förste Häftet, pls. i. & ii.

SCHNEIDER, J. S. Oversigt af *Lepidoptera* jagttagne paa Tromsø og i nærmeste omegn. *Tromsø Mus. Aarsh. 1883. (Cf. Ent. Nachr. x. p. 108.)

112 species recorded from Tromsø.

Notes on new or little-known Swedish *Noctua* and *Geometrae*; Meyer, Ent. Tidskr. v. pp. 71 & 72.

14 *Lepidoptera* noticed as recently added to the Norwegian list; Schöyen, Ent. Tidskr. v. pp. 55-60.

Additions to list of Swedish *Lepidoptera*; Thomson, Opusc. Ent. x. pp. 1036-1039.

Russian Empire, and Northern and Central Asia.

CHRISTOPH, H. *Lepidoptera* aus dem Acha-Tekke-Gebiete. Erster Theil. Romanoff, Mém. Léop. i. pp. 93-138, pls. vi.-viii.

153 species enumerated, as far as *Hypena*, several being described as new. Some account of the district is prefixed to the paper.

GRUMM-GRSHIMAILO, G. *Lepidopterologische Mittheilungen*. Romanoff, Mém. Léop. i. pp. 162-173.

Relates to various species observed in the neighbourhood of Sarepta.

ROMANOFF, N. M. Mémoires sur les Lépidoptères. Tome i. St. Petersburg: 1884, roy. 8vo, pp. 181, col. pls. x. & map. (Cf. S. E. Z. xlv. pp. 477-487; C.R. Ent. Belg. xxviii. pp. ccxxxii.-ccxxxvi.)

Includes articles by Romanoff, Christoph, Staudinger, Snellen, and Grumm-Grshimailo: and index.

[ROMANOFF, N. M.] Les Lépidoptères de la Transcaucasie. 1ière partie. Romanoff, Mém. Lép. i. pp. 1-92, pls. i.-v. & map.

Contains an introductory account of the geography and botany of the Caucasus and Transcaucasia; a table of the position and altitude of the principal localities noticed; the temperature and rainfall at the principal towns; and a systematic list of *Rhopalocera*, *Sphinges*, and *Bombyces* (*Nycteolidæ*, *Lithosiidæ*, *Arctiidæ*, and *Hepialidæ*).

STAUDINGER, O. Beitrag zur Kenntniss der Lepidopteren-Fauna des Achal-Tekke-Gebietes. Romanoff, Mém. Lép. i. pp. 139-154, pl. ix.

9 species, mostly new, described and figured; a list of species collected by Eylandt at Askhabad is added.

Additions to the *Lepidoptera* of St. Petersburg; Von Hedemann, Hor. Ent. Ross. xviii. pp. 63-65.

Additions to the list of *Lepidoptera* of the Baltic Provinces; Siutenis, Arch. Nat. Liv. ix. pp. 217-220.

Short notes on Livonian *Lepidoptera*; Teich, S. E. Z. xlv. pp. 211-214. Cf. also Sintenis, SB. Ges. Dorp. vii. pp. 150-158.

Indo-Malayan Region.

DE NICÉVILLE, L. Third List of Butterflies taken in Sikkim in October, 1883, with notes on habits, &c. J. A. S. B. lii. pp. 92-100.

81 species added, raising the number of species observed in Sikkim in the month of October to 284. Short notes on sexes, localities, &c., are occasionally added.

FORSAYETH, R. W. Life-history of sixty species of *Lepidoptera* observed in Mhow, Central India. Tr. E. Soc. 1884, pp. 377-419, pls. xiv. & xv.

The writer's observations are more or less complete; the arrangement and nomenclature are by A. G. Butler.

KHEIL, N. M. Die Fauna des Indo-Malayischen Archipels. Die *Rhopalocera* der Insel Nias. Berlin: 4to 1884, pp. 38, pls. v. (Cf. S. E. Z. xlv. pp. 398 & 399; Ent. Nachr. x. pp. 169-171.)

Includes a general description of the island and its inhabitants, and a list of 149 butterflies, with occasional notes on known species, and descriptions of several new ones, illustrated by photographic plates.

Part vii. of Distant's "*Rhopalocera Malayana*" has appeared within the year (pp. 193-248, pls. xxii. & xxiii.). It includes *Stiboges* (the last genus of *Erycinidæ*) and *Lycenidæ*, as far as the genus *Neomyrina*.

Part ix. of Moore's "*Lepidoptera of Ceylon*" (iii. pp. 1-88, pls. cxliv.-clvii.) has appeared within the year, extending from *Cymatophoridae* to *Gonopteridae* inclusive, the plates, however, being slightly in advance of the text.

List of *Rhopalocera* collected by Weyers in Sumatra; Lamarche, C.R. ent. Belg. xxviii. pp. cccxxxix. & cccxl.

Notes on butterflies from Yunnan; Oberthür, Bull. Soc. Ent. Fr. (6) iii. p. cxxix.

Austro-Malayan Region.

BUTLER, A. G. A Collection of Butterflies from the Fiji Islands. Ann. N. H. (5) xiii. pp. 343-348.

21 species noticed, collected by C. M. Woodford, several new.

— Concerning E. Meyrick's views of certain New Zealand and Australian forms of *Lepidoptera*. Cist. Ent. iii. pp. 65-75.

A controversial paper; some of the more important synonymic notes will be referred to in their place.

PAGENSTECHE, A. Beiträge zur Lepidopteren-Fauna van Amboina. JB. nass. Ver. xxxvii. pp. 150-326, pls. vi. & vii.

Consists of a general introduction, chiefly compiled from Wallace, relative to the character of Amboina and the adjacent islands; a bibliography of the *Lepidoptera*, and a list of species (amounting to 451, of which 41 are described as new); and a comprehensive table showing the distribution of Amboinese species in other parts of the world. The author's observations on known species, though important, are too numerous to be given here in detail; but it may be useful to call attention to his having frequently inserted German translations of Snellen's Dutch descriptions of Amboinese species.

WALKER, J. J. Entomological Collecting on a Voyage in the Pacific. Ent. M. M. xx. pp. 222-225, and xxi. pp. 115-120. (Cf. also Tr. E. Soc. 1884, pp. xxvii. & xxviii.)

Relates to the *Lepidoptera* observed at Tahiti, Pitcairn, Coquimbo, and at various points of the west coast of S. America, as far south as the Straits of Magellan.

Occurrence of English butterflies in New Zealand; Kirk, N. Z. J. Sci. ii. p. 169.

Rough notes on New Zealand *Lepidoptera*; Mathew, Ent. xvii. pp. 217-221, 247-250, & 266-269.

Notes on *Lepidoptera* collected by Palisa at Carolina Island; Mem. Nat. Ac. Sci., Rep. Eclipse Exped., pp. 93-96.

Africa.

GODMAN, F. D., SALVIN, O., & DRUCE, H. On the *Lepidoptera* collected by the late W. A. Forbes on the banks of the Lower Niger. *Rhopalocera*, by F. D. Godman & O. Salvin; *Heterocera*, by H. Druce. P. Z. S. 1884, pp. 219-229, pl. xvii.

50 *Rhopalocera* and 21 *Heterocera* enumerated, 5 new.

MÜSCHLER, H. B. Beiträge zur Schmetterlings-Fauna des Kaffernlandes. Verh. z.-b. Wien, xxxiii. pp. 267-310, pl. xvi.

157 species enumerated, many new.

SAALMÜLLER, M. Lepidopteren von Madagascar. Neue und wenig bekannte Arten zumeist aus der Sammlung der Senckenberg'schen naturforschenden Gesellschaft zu Frankfurt-am-Main unter Berücksichtigung der gesammten Lepidopteren-Fauna Madagascars. Herausgegeben im Auftrage der Gesellschaft von M. Saalmüller. Erste

Abtheilung: *Rhopalocera*; *Heterocera*: *Sphinges* et *Bombyces*. Ausgegeben Mai, 1884. Frankfurt-am-Main: 4to, pp. 246. 6 col. pls. & illuminated title-page. (Cf. Tijdschr. Ent. xxvii. pp. 244-248.)

577 species are enumerated. The systematic portion of the work is preceded by a geographical account of the island, and a good bibliography. All the new species described are from Nossi-Bé or Betsileo.

Captures of *Lepidoptera* in the province of Constantina, Algeria, by Merkl; C. Oberthür, Bull. Soc. Ent. Fr. (6) iv. p. lxxxv.

Notes on *Lepidoptera* in S. Africa; Bairstow, Naturalist (2) ix. pp. 112-114, 134-136, & 141.

North America.

EDWARDS, W. H. Revised Catalogue of the Diurnal *Lepidoptera* of America North of Mexico. Tr. Am. Ent. Soc. xi. pp. 245-337 (also sep., pp. 95).

612 species, exclusive of several rejected as perhaps erroneously attributed to the Fauna.

* FERNALD, C. H. The Butterflies of Maine. Augusta: 1884, 8vo, pp. 104, figs. 28. (Cf. Canad. Ent. xvi. p. 59, and Ent. xvii. p. 263.)

GRUBER, A. Ueber nordamerikanische Papilioniden- und Nymphaliden-Raupen. Jen. Z. Nat. xvii. pp. 465-489, pls. vii. & viii. (Cf. also Papilio, iv. pp. 83-91 & 115-121.)

Contains descriptions of the various stages of the larvæ of the following species:—*Papilio asterius*, *brevicauda*, *machaon*, *turnus*, *troilus*, *ajax*, *philenor*, *Melitæa phæton*, *marcia*, *nycteis*, *tharos*, and *Argynnis myrina*. The bristle-bearing warts of the *Papilionidæ*, which are conspicuous in the earlier, rapidly become rudimentary in the later, stages.

LINTNER, J. A. On some Rio Grande [Texas] *Lepidoptera*. Papilio, iv. pp. 135-147.

61 butterflies, *Sphinges*, and *Bombyces* noticed, some new.

SMITH, J. B. An Introduction to a Classification of N. American *Lepidoptera*. Bull. Brooklyn Soc. vii. pp. 70-74 & 81-83, pl. iii.

Includes a table of families, based upon Herrich-Schäffer.

WEIR, J. J. Further Notes on the *Lepidoptera Rhopalocera* of Hudson's Bay. Ent. xvii. pp. 50-52.

The butterflies are of decidedly European type.

Part xii. of vol. ii. of Edwards' "Butterflies of North America" has appeared within the year.

Synopsis of North American butterflies (*Apatura* to *Chionobas*), Hulst; Bull. Brooklyn Soc. vi. pp. 113-129, and vii. pp. 101-103 & 109-111.

Peale's "*Lepidoptera Americana*" noticed; Kirby & Peale, Papilio, iv. pp. 103, 104, & 150.

A short article on "N. American Butterflies" (relating principally to moths), by S. A. Pearce, will be found in Encycl. Am. i. pp. 686-688.

On rearing various N. American butterflies; W. H. Edwards, Rep. E. Soc. Ont. 1883, pp. 17 & 18.

Unimportant notes on various N. American *Sphinges*, *Bombyces*, and *Geometræ*; Packard, Am. Nat. xviii. pp. 632 & 633.

Collecting at light and sugar in N. America; Bull. Brooklyn Soc. vii. pp. 105 & 106.

Appearance of butterflies in Southern California affected by earthquake; Wright, Papilio, iv. p. 113.

List of butterflies collected in the North-West Territory and the Rocky Mountains; Geddes, Canad. Ent. xv. pp. 221-224, and xvi. pp. 56 & 57.

List of 34 species collected by W. M. Courtis, in Judith Mountains, Montana, in 1883, with remarks, and descriptions of 2 new species; W. H. Edwards, Papilio, iii. pp. 157-164.

Captures of rare N. American butterflies in New Jersey; Aaron, Papilio, iv. p. 22.

Captures of rare *Lepidoptera* at Racine, Wisconsin; Hoy, Canad. Ent. xvi. p. 200.

Captures of *Lepidoptera* at Point Pelee, on Lake Erie, including *Terias mexicana* and *Thecla smilacis*, Boisd. (new to Canada), the descriptions of which are reprinted; W. Saunders, Canad. Ent. xvi. pp. 50-53.

Captures of *Zygænidæ* and *Bombycidæ* at Orono, Maine; [Mrs.] C. H. Fernald, Canad. Ent. xvi. pp. 57 & 58.

South and Tropical America.

DRUCE, H. *Biologia Centrali-Americana*. [Vide Godman & Salvin: INSECTA, General Subject.] *Lepidoptera Heterocera*, pp. 33-112, pls. vi.-xi.

Extends from *Tirista* to *Pericopis*.

GODMAN, F. D., & SALVIN, O. *Biologia Centrali-Americana*. [Vide INSECTA, General Subject.] *Lepidoptera Rhopalocera*, i. pp. 289-360, pls. xxviii.-xxxvii.

Extends from *Timetes* to *Libythea*.

WALKER, J. J. [Vide *antea*, sub Austro-Malayan Region.]

Food-plants of larvæ of Brazilian butterflies as indicating affinities both between the insects and between the plants on which they feed; F. Müller & others, Nature, xxx. pp. 240 & 269, and Gard. Chron. (2) xxii. p. 82.

Habits, &c., of Brazilian butterflies; Jones, Naturalist, (2) ix. pp. 126-131.

Lepidoptera observed on board ship, off Brazil; Fromont, Ent. Nachr. x. p. 90.

List of 27 *Rhopalocera* (3 new) and 95 *Heterocera* (2 new) collected by G. F. Angas in the island of Dominica; Godman, Salvin, & Druce, P. Z. S. 1884, pp. 314-326, pl. xxv.

PAPILIONIDÆ.

Notes on various *Papilionidæ* in the Brussels Museum; De Borre, C.R. ent. Belg. xxviii. pp. cxxv. & cxxvi.

Ornithoptera amphrysus, Cram., *Papilio neptunus*, Guér., and *memnon*, Linn., and var. *achates*, Cram., noticed from Nias ; Kheil, Rhop. Nias, pp. 36 & 37.

Papilio. Note on the forms allied to *P. machaon* ; Lyman, *Papilio*, iii. pp. 144 & 145. *P. jason*, Linn., ab. *evemonides*, fig. 2, *bathycles*, Zink., var. *bathycleides*, fig. 3, both from Malacca and Borneo, p. 396. *chiron*, Wall., var. *chironides*, fig. 4, from Darjiling, Silhet, &c., and *sarpedon*, Linn., ab. *milonides* from Celebes, p. 397, noticed ; Honrath, B. E. Z. xxviii. pl. x. *P. daunus*, *pilumnus*, Boisd., *helleri*, Feld., *thymbræus*, Boisd., and *pompeius*, Fabr., var. *pandion*, Feld.: transformations described ; Schaus, *Papilio*, iii. pp. 186 & 187, and iv. pp. 100 & 101. *P. oribazus*, Boisd., pl. iii. fig. 30, p. 55, *cyrnus*, Boisd., pl. ii. figs. 17 & 18, p. 57, *endochus*, Boisd., pl. iii. fig. 31, p. 59, *delalandii*, Godt., fig. 1, p. 60, *meriones*, Feld., fig. 2, pl. i. p. 62, redescribed and figured ; Saalmüller, Lep. Mad. i. *P. merope*, Cram., and *nireus*, Linn., noticed from Caffraria ; Möschler, Verh. z.-b. Wien, xxxiii. pp. 268 & 269. *P. alexanor*, Esp., var. *orientalis* from Ordubad and Persia described and figured ; Romanoff, Mém. Léop. i. p. 41, pl. v. fig. 1. *P. antimachus*, Drury : note on specimens in collections ; H. Edwards, *Papilio*, iv. p. 21. *P. asterias* preyed upon by *Anax longipes* ; Hagen, Ent. M. M. xx. p. 169. *P. cresphontes*, Cram. : food-plants noticed, and egg and young larva described ; W. Saunders, Canad. Ent. xv. pp. 204, 234, & 235 : larva destroyed by *Mutilla* and ants ; Neal, Bull. Dep. Agric. Ent. iv. p. 87. *P. erioleuca*, Oberth. (? = *aidoneus*, Doubl.), noticed, and ♀ described ; De Nicéville, J. A. S. B. lii. p. 98. *P. erithonius*, Linn. : transformations described ; Forsayeth, Tr. E. Soc. 1884, pp. 386 & 387. *P. machaon* ab. *drusus* from the Rheingau discussed ; Fuchs, S. E. Z. xlv. pp. 241-244 : another aberration described and figured ; Weymer, JB. Ver. Elberfeld, vi. pp. 63 & 64, pl. i. fig. 1. *P. neodamas*, Luc., noticed from Dominica ; Godman & Salvin, P. Z. S. 1884, p. 318. *P. oribazus*, Boisd., drinking water to excess in Madagascar ; Baron, Nature, xxix. p. 503, and Ent. M. M. xx. pp. 276 & 277. *P. podalirius*, Linn. : on rearing ; Lehmann, Z. E. Ver. schles (2) ix. pp. 22 & 23. *P. polydamas*, Linn., imbibes water in the same manner as *Pantherodes pardalaria* ; Heczko, P. E. Soc. 1884, p. xxiv. *P. rutulus*, Boisd., and var. *arizonensis*, Edw. : transformations described and figured ; W. H. Edwards, Butt. N. Am. ii. *Papilio*, pls. xii. & xiii. *P. turnus*, Linn., figured ; Fyles, Rep. E. Soc. Ont. 1883, p. 63, fig. 32 : food-plants mentioned ; Saunders, Canad. Ent. xv. p. 204. *P. zalmoxis*, Linn., supposed ♀ ; Rössler & Staudinger, S. E. Z. xlv. pp. 142-144, 298, & 299.

Thais polyxena, W. V., captured at Exeter ; Parfitt, Ent. M. M. xxi. p. 34. Ab. *flavomacula* described ; Schilde, Ent. Nachr. x. p. 332. Var. *polymnia*, Mill., noticed ; Ragusa, Nat. Sicil. iv. p. 30.

Hypermnestra helios, Nick., var. *marina*, Staud., noticed ; Lang, Butt. Eur. p. 365.

Doritis apollinus, Herbst, var. *krySTALLina* described ; Schilde, t. c. p. 333.

Parnassius. The American species pass the winter as ova ; W. H. Edwards, Canad. Ent. xvi. p. 88. *P. hardwickii*, Gray, *apollo*, Linn.,

and *delius*, Esp., discussed ; Schilde, *t. c.* pp. 334 & 335. *P. apollo*, Linn. : variation in the Pyrenees ; Oberthür, *Études d'Ent.* viii. p. 13, *P. delius*, Esp. : 2 ♀ varieties from the Valais described ; Frey, *MT. schw. ent. Ges.* vii. pp. 10 & 11. *P. imperator*, Oberthür, redescribed and figured by him ; *op. cit.* ix. p. 11, pl. i. fig. 4. *P. smintheus*, Doubl., var. *hermione*, H. Edw., discussed ; W. H. Edwards, *Papilio*, iii. pp. 158-160.

Davidina, Oberth., and *Calinaga*, Moore, referred by Lucas to the *Papilionidæ*, between *Parnassius* and *Leuconea* ; *Bull. Soc. Ent. Fr.* (6) iv. p. lxxxvi.

Papilio arianus (= *ariarathes*, Esp.), pl. viii., *Amazons*, p. 12, *plestolaus*, Colombia, p. 17, *pizarro*, *Amazons*, p. 18, *tasso*, Brazil, *aristogiton*, p. 19, *hipparchus*, Colombia, and *leucadian*, Betchian & Gilialo, pl. xiii. p. 20, Staudinger, *Exot. Schmett.* ; *P. ladakensis*, Ladak, and *sikkimensis*, Sikkim, Moore, *J. A. S. B.* liii. pp. 46 & 47 ; *P. almansor*, Guinea, Ashanti, fig. 9, *poggianus*, Guinea, fig. 10, pl. vii. p. 210, and *streckerianus*, *Amazons*, pl. x. figs. 1 & 1a, *Amazons*, p. 395, Honrath, *B. E. Z.* xxviii. ; *P. nitra*, W. H. Edwards, *Papilio*, iii. p. 162, Montana ; *P. thomsonii*, Butler, *Ann. N. H.* (5) xiii. p. 197, Ké Dulan : spp. nn.

PIERIDÆ.

FLAVES, H. J. Additional Notes on the Genus *Colias*. *Tr. E. Soc.* 1884, pp. 1-26.

Includes critical and synonymic notes on a large number of species, with special reference to recent papers of Keferstein, Hagen, and Alphéraky.

SWINHOE, C. On some new and little-known species of Butterflies of the Genus *Teracolus*. *P. Z. S.* 1884, pp. 434-445, pls. xxxix. & xl.

22 species (mostly new) enumerated, 4 from Africa and 18 from Asia. The known species noticed are—*T. leo*, Butl., fig. 3, *pleione*, Klug, *miriam*, Feld., *fausta*, Oliv. (= *faustina*, Feld., and *oriens*, Butl.), *solaris*, Butl., fig. 5, *halimede*, Klug, fig. 4, pl. lxxix., *phisadia*, Godt. (= *arne*, Klug), and *phanus*, Butl.

Migration of *Pieridæ* at Agoué, in West Africa, from east to west, during the rainy season ; Ménager & Oberthür, *Bull. Soc. Ent. Fr.* (6) iii. pp. cxxvii. & cxxviii.

Pieris napi, Linn., and var. *bryonia*, Esp., *rapæ*, *brassicæ*, *Anthocharis cardamines*, *Colias palæno*, Linn., abb. *werdandi*, Zett., and *cretacea*, Schilde, *pelidne*, *nastes*, Boisd., *phicomone*, *myrmidone*, Esp., *thisoa*, Mén., *hecla*, Lef., *pyrrhothea*, Fabr., and *rutilans*, Boisd. Broods, variation, &c., discussed ; Schilde, *Ent. Nachr.* x. pp. 335-346.

Terias asiopæ, Mén. (transformations), and *Delias eucharis*, Dru. (pupæ), noticed, and larva and pupa of the former figured ; Forsayeth, *Tr. E. Soc.* 1884, p. 385, pl. xiv. figs. 1 & 1a.

Möschler, *Verh. z.-b. Wien*, xxxiii. pp. 269-282, discusses the following African *Pieridæ* :—*Pieris eriphia*, Godt., *Tachyris* (divided into 2 groups by the presence or absence of nervure 8), *T. rhodope*, Fabr. (♂ ? =

poppea, Boisd., and *sylvia*, Fabr. & Boisd.; ♀ = *eudoxia*, Cram., and *poppea*, Cram.), *poppea*, Cram. (? = *sylvia*, Fabr., var. *nubila*, Möschl., *phileris*, Boisd., and var. or ab. ♀ *spica*, Möschl., = ♂ *eudoxia*, Boisd.). *Teracolus omphaloides*, Boisd., var. *corda*, Möschl., *Eurema brigitta*, Cram. (= *rakel*, Fabr., and varr. *pulchella*, Boisd., and *zoe*, Hopff., = *pulchella*, Hübn.), and *desjardinsii*, Boisd. (= *senegalensis*, Hübn.).

Saalmüller, Lep. Mad. i., redescribes and figures *Ptychopteryx lucasi*, Grandid., pl. ii. figs. 19-21, p. 67, *Teracolus mananhari*, Ward, pl. iii. fig. 33, p. 68, and *Callosune evanthe*, Boisd., figs. 22 & 23, pl. ii. p. 70.

Pieris amaryllis, Fabr., *Nathalis iole*, Boisd., *Phæbis agarithe*, Boisd., *Kricogonia fantasma*, Butl., *terissa*, Luc., and *Terias lisa*, Boisd., from Rio Grande, Texas, discussed; Lintner, Papilio, iv. pp. 136-139.

Callidryas philea, Linn., and *Terias mexicana*, Boisd., recorded from Wisconsin; W. H. Edwards, Papilio, iv. p. 113.

Aporia crategi, Linn. Malformed specimen noticed and figured; Krancher, Psyche, iv. p. 202, fig. 12.

Metaporia caphusa, Moore, mimicked by *Hestina zella*, Butl.; De Nicéville, J. A. S. B. lii. pp. 65 & 66.

Pieris brassica: enormous number of larvæ destroyed by *Microgaster* at Nancy; Millat, Bull. Soc. Ent. Fr. (6) iii. pp. cxvii. & cxviii.: variety noticed; Wildes, Ent. xvii. p. 141. Della Torre, Bull. Ent. Ital. xvi. pp. 62-64, has published some preliminary observations on the integument of the pupa, which he finds, on making a transverse section of the abdominal region, to consist of three layers, viz. :—(1) a chitinous layer; (2) a chitinogenous, or hypodermic, layer; and (3) a very delicate internal membrane. *P. menapia*, Feld., destroyed by *Podiscus crocatus*, Uhl. (MS.), and *Neides muticus*, Say; Hagen, Canad. Ent. xvi. p. 40. *P. napi*, Linn.: migrations from north to south in the Upper Engadine; Ficke, Ent. Nachr. x. pp. 373 & 374. *P. rapæ*, Linn.: broods discussed; Fuchs, S. E. Z. xlv. pp. 244-248: on destroying; Forbes, Rep. Ins. Illin. xii. pp. 92-97, figs. 15 & 16; larvæ destroyed by bacteria; Riley, *Scientific American (cf. Am. Nat. xviii. p. 80).

Appias saba, Fabr., drinking water to excess in Madagascar; Baron, Nature, xxix. p. 503, and Ent. M. M. xx. pp. 276 & 277.

Tachyris melania, Fabr. (nec Boisd., which = *ega*, Boisd., ♀), discussed; *T. clementina*, Feld., is the ♀: Miskin, Tr. E. Soc. 1884, pp. 91 & 92. *T. placidia*, Stoll, var. *maculata* from Batchian described and figured; Staudinger, Exot. Schmett. p. 30, pl. xvii.

Cathamia hyparete, Linn., noticed from Nias; Snellen, Tijdschr. Ent. xxvii. p. lxxxii.

Gonepteryx rhamni, Linn. Note on food-plants; Sladen, Ent. xvii. p. 42. Effect of cyanide on colour; Barrett, Ent. M. M. xxi. p. 23.

Colias. W. H. Edwards replies to Hagen (P. Bost. Soc. xii. pp. 150-178; cf. Zool. Rec. Ins. xx. p. 165); Papilio, iii. pp. 169-185. Riley, commenting on the same paper, considers that there are only 3 well-marked common N. American species, *C. eurydice*, Boisd., *casonia*, Stoll, and *chrysotheme*, Esp.; Am. Nat. xviii. pp. 74-76. Corrections to a paper on *Colias* in S. E. Z. xlv. pp. 488-495 [cf. Zool. Rec. xx. *Ins.*

p. 166]; Alphéraky, S. E. Z. xlv. p. 476. *C. eurydice*, Boisd.: transformations described; the species is not generically different from *Colias*; W. H. Edwards, Canad. Ent. xv. pp. 224-228 (Butler, however, considers *Meganostoma*, Reak, a good genus; Papilio, iv. pp. 58 & 59). *C. hyale*, Linn., *erate*, Esp., and *edusa*, Fabr.: Grumm-Grshimailo notices the forms which occur at Sarepta, including an hermaphrodite of *erate* (right side yellow ♂, left side white ♀, = *pallida*, Staud.): *C. chrysotheme*, though found in the Government of Saratow, does not occur at Sarepta; Romanoff's Mém. Léop. i. pp. 162-167. *C. harfordii*, H. Edw. (♀ = *barbara*, H. Edw.): transformations discussed; W. H. Edwards, Papilio, iv. pp. 2-7. *C. christina* and *astræa*, Edw., discussed; they are probably forms of one species: *id. op. cit.* iii. p. 160, and iv. pp. 30-34. Lyman considers *C. christina* distinct, and describes it with its varieties; Canad. Ent. xvi. pp. 5-9. *C. eurytheme*, Boisd., and *philodice*, Godt.: on breeding from the egg; Fletcher, Canad. Ent. xvi. p. 223. *C. aurorina*, Herr.-Schäff., var. ♀ from Nuchur noticed; Christoph, in Romanoff's Mém. Léop. i. p. 101. *C. edusa*, Fabr.: varieties at Plymouth noticed; Bignell, Ent. M. M. xxi. p. 22: hermaphrodite noticed and figured; Wachtl, Wien. ent. Z. iii. p. 289, pl. v. fig. 1. *C. nastes*, Boisd.: occurrence in Norwegian Finland; Aurivillius, Ent. Tidskr. v. pp. 203 & 230. *C. phicomone*, Esp., var. from the Pyrenees noticed; Oberthür, Études d'Ent. viii. p. 14. *Hebomoia vossii*, Maitl., noticed and figured; Kheil, Rhop. Nias, p. 35, pl. iv. fig. 24.

Thestias ænippe, Cram., var., from Java, described and figured; Snellen, Tijdschr. Ent. xxvii. pp. 210 & 211, pl. xi. fig. 3.

Idmais maimuna, Kirb., figs. 1, 1a, 2, & 2a, and *eris*, Klug, figs. 3 & 3a, figured by Waterhouse, Aid. iii. pl. cxliii.

Zegris eupheme, Esp., ab. *tschudica*, Herr.-Schäff., recorded from Sarepta; Grumm-Grshimailo, t. c. p. 173.

Anthocharis belia, Esp., var. *pulverata* from Kisil-Arvat, &c., described; Christoph, t. c. p. 99.

New species:—

Pereute chiriquensis, pl. xv., *cheops*, Chiriqui, p. 23, and *callinira* [sic], Peru, Colombia, p. 24, Staudinger, Exot. Schmett.

Dismorphia amalia (? = *cornelia*, Feld.), Chiriqui, *arsinoides* (? = *arsinoe*, Feld.), Chiriqui, *lysinoides*, Cauca, and *mimetica*, Cayenne, *id. t. c.* p. 25, pl. xv.

Eurema hahneli, Amazons, and *elathides*, Merida; *id. t. c.* p. 28; pl. xvi.

Terias linda, W. H. Edwards, Papilio, iv. p. 53, Mexico, Arizona; *T. photophila*, Ké Dulan, and *biformis*, Amboina, Butler, Ann. N. H. (5) xii. p. 196.

Pieris spilleri, Spiller, Ent. xvii. p. 62; Staudinger, Ent. Nachr. x. pp. 52, 115, & 116, and Exot. Schmett. p. 33, pl. xviii.; Dunning, Ent. xvii. pp. 94-96, Natal: *P. bieti*, figs. 7 & 8, *martineti*, fig. 5, p. 12, and *dubernardi*, fig. 6, Oberthür, Études d'Ent. ix. pl. i., Thibet.

Catopha wardii, Coonoor, Nilgiris, S. India, and *roepstorffii*, Nicobars, Moore, J. A. S. B. liii. pp. 43 & 44.

Mancipium naganum, Moore, *t. c.* p. 45, Naga Hills, Assam; *M. deota*, fig. 10, and *derta*, figs. 9 & 9a, De Nicéville, J. A. S. B. lii. p. 82, pl. ix., Ladak.

Appias amboides, Moore, *t. c.* p. 46, Silhet, Assam.

Hiposcritia imbecilis, *id. ibid.*, Silhet, Assam.

Tachyris mata, Kheil, Rhop. Nias, p. 34, pl. iv. fig. 21, Nias.

Delias niasana, pl. iv. figs. 22 & 23, and var. *amarilla*, *id. t. c.* p. 35, Nias; *D. nigridius*, Miskin, Tr. E. Soc. 1884, p. 93, Queensland.

Kricogonia lanice, Lintner, Papilio, iv. p. 138, Texas.

Colias marnoana, Rogenhofer, SB. z.-b. Wien, xxxiii. p. 22, Soudan;

C. hagenii, W. H. Edwards, Papilio, iii. pp. 160 & 163, Rocky Mountains.

Irias ganduca, Moore, *t. c.* p. 44, Calcutta.

Idmais surya, *id. t. c.* p. 45, Orissa; *I. costalis* and *venosa*, Staudinger, pl. xxiii.

Teracolus celestis, figs. 1 & 2, p. 435, *vi*, figs. 6 & 7, Aden, p. 437, *rorus*, fig. 8, Sukkur, N. Sind, p. 438, *peelus*, fig. 9, *dubius*, Kurrachee, p. 439, *kennedii*, Ahmednuggur, *xanthus*, figs. 10 & 11, Soudan, p. 440, *yerburi*, fig. 12, pl. xxxix., *saxeus*, figs. 1 & 2, Aden, *odysseus*, fig. 3, White Nile, p. 441, *fumidus*, figs. 4 & 5, Transvaal, p. 442, *immaculatus*, *subroseus*, figs. 6 & 7, Kurrachee, p. 443, *taplini*, figs. 8 & 9, Bombay, Poona, *sipylus*, figs. 10 & 11, pl. xl., Zanzibar, p. 444, Swinhoe, P. Z. S. 1884; *T. arenicolens*, Butler, Ent. M. M. xxi. p. 81, Arabia; *T. walkeri*, *id. Ann. N. H.* (5) xiv. p. 403, S.W. Africa.

Callosune hildebrandti, *hevernichi*, and *vulnerata*, Staudinger, *t.* pl. xxiii.

Anthocharis bieti, Oberthür, *t. c.* p. 14, pl. i. fig. 1, Thibet; *A. tomyris*, Christoph, in Romanoff's Mém. Léop. i. p. 99, pl. vi. figs. 1a & b, Askhabad.

DANAIDÆ.

Euplea midamus, Linn., *rhodamanthus*, Fabr., *bremeri*, Feld., *Danaïs philomela*, Zinck. (= *crocea*, Butl.), and *agleoides*, Feld. Varieties from Nias noticed; Snellen, Tijdschr. Ent. xxvii. pp. lxxxi. & lxxxii.

Salatura cleona, Cram., and *Trepsichrois verhuelli*, Moore, ♂ (?), noticed; Butler, Ann. N. H. (5) xiii. p. 191, and xiv. p. 403.

Limnas chrysippus, Linn., and *Tirumala linniace*, Cram. Transformations described; Forsayeth, Tr. E. Soc. 1884, pp. 380 & 381.

Hestia. Flight noticed; Kheil, Rhop. Nias, p. 15.

Danaïs archippus, Fabr., figured; Fyles, Rep. E. Soc. Ont. 1883, fig. 38. *D. chrysippus*, Linn., var. *vigilii* from Poeloe Bras described and figured; Heylaerts, C.R. ent. Belg. xxviii. p. xcix, and Snellen, Tijdschr. Ent. xxvii. pp. lxxx., lxxxi., lxxxiv., lxxxv., & 210, pl. xi. fig. 2.

Euplea niasica, Moore, fig. 2, and *verhuelli*, Moore, fig. 5, redescribed and figured; Kheil, *t. c.* pp. 17 & 18, pl. i.

Lycorea cleobæa, Godt., var., and *Ituna lamirus*, Latr., figured; Staudinger, Exot. Schmett. pls. xxvi. & xxvii.

New species :—

The following species, presumably new, are figured by Staudinger (Exot. Schmett.), in advance of the text:—*Euplea plateni* and *eichhorni*,

pl. xxvi., *Thyridia singularis*, *Dicenna steinheilii*, *Epizomia valera*, *Ceratinia pantherina* and *apollinis*, pl. xxvii., *Mechanitis huallaga* and *dorisides*, *Napeogenes iquitensis*, pl. xxviii., *Ithomia ilerodinoides*, pl. xxviii., *lora*, *athulina*, *troetschi*, *fausta*, *fullax*, *starkei*, *ladra*, pl. xxix., *canaletta*, *paradoxa*, and *anomala*, and *Tithorea susanna* and *furia*, pl. xxx.

Danaïs clarippus, Weymer, Ent. Nachr. x. p. 257, Nias.

Salatura eurydice, Butler, Ann. N. H. (5) xiii. p. 58, Nias.

Caduga funeralis, *id. ibid.*, Nias.

Anosia leucogyne, *id. t. c.* p. 183, St. Thomas.

Vadebra murrayi, Amboina, and *mangoensis*, Fiji, *id. t. c.* pp. 191 & 344.

Danisepa schreiberi, *id. op. cit.* xiv. p. 403, N.E. Borneo.

Hamadryas niveipicta, *id. op. cit.* xiii. p. 191, Kè Dulan.

Eupleea pheretena, fig. 1, and *staudingeri*, figs. 3 & 4, Kheil, Rhop. Nias, pp. 16 & 17, pl. i.

Lycorea cinnamomea, Weymer, S. E. Z. xlv. p. 7, pl. ii. fig. 6, Tabatinga, Amazons (*cf. also* Srnka, S. E. Z. xlv. pp. 295 & 296).

Methona curvifascia, *id. t. c.* p. 8, pl. ii. fig. 3, Ecuador (*cf. also* Srnka, *t. c.* p. 296).

Ceratinia honesta, Ecuador, pl. ii. fig. 5, and *amica*, Colombia, pl. i. fig. 7, *id. t. c.* pp. 9 & 10. (Srnka notices *C. amica*, ♀; *t. c.* p. 296.)

Sais promissa, *id. t. c.* p. 11, pl. ii. fig. 4, Tabatinga, Amazons (*cf. also* Srnka, *t. c.* p. 296).

Mechanitis proceris, *id. t. c.* p. 12, pl. i. fig. 2, Tunantins, Amazons (*cf. also* Srnka, *t. c.* p. 297).

Leucothyris paula, Veragua, Central America, and *solida*, Ecuador, *id. t. c.* pp. 14 & 15, pl. ii. figs. 2 & 8.

Ithomia soligena, pl. ii. fig. 7, and *mellilla*, *id. t. c.* pp. 16 & 17, Ecuador. (Srnka notices *I. mellilla*, *t. c.* p. 298.)

Hymenitis matronalis, *id. t. c.* p. 18, pl. i. fig. 6, Ecuador.

Athyrtis salvinii, Srnka, B. E. Z. xxvii. p. 163, Staudinger, Exot. Schmett. pl. xxx., Peru.

ACREIDÆ.

Acrea manandaza, Ward (= *ranavalona*, ♀, Boisd.), is not truly distinct from *piva*, Guén., p. 74. *A. szanzini*, Boisd., = *lycia*, Fabr., *A. masamba*, Ward, pl. iii. fig. 32, p. 75, and *boseæ*, Saalm., pl. i. fig. 3, p. 76, redescribed and figured; Saalmüller, Lep. Mad. i. *A. neobule*, Guér., *rahira*, Boisd., *serena*, Fabr., and *esebria*, Hew. (= *protea*, Trim.), noticed; Möschler, Verh. z.-b. Wien, xxxiii. p. 283.

Acrea दौरα, Lower Niger, Zanzibar, fig. 3, and *calyce*, W. Africa, figs. 1 & 2, pp. iii.; Godman & Salvin, P. Z. S. 1884, p. 221, pl. xvii.

HELICONIIDÆ.

Heliconius damysus, Hopff., = *chestertonii*, Hew.; *melicerta*, Bates, = *clara*, Fabr.; *fritschei*, Möschl., = *ismenius*, Latr.: Weymer, S. E. Z. xlv. p. 27.

Heliconius aulicus (Plötz, MS.), fig. 1, Colombia, p. 19, *fortunatus*, fig. 4,

Amazons, p. 21, *mentor*, fig. 3, pl. i., New Granada, p. 22, *metaphorus*, pl. ii. fig. 1, Ecuador, p. 24, and *hyas*, pl. i. fig. 5, Amazons, p. 26, spp. nn., Weymer, S. E. Z. xlv.

NYMPHALIDÆ.

* CHATIN, J. Structure et Développement des bâtonnets antennaires chez la *Vanessa* Paon-du-jour. Paris : 1884, 4to, pp. 20, pls. i. & ii.

Probably an amplification of a paper in C.R. xcvi. pp. 677-679. [Cf. Zool. Rec. xx. *Ins.* p. 173, and Behrens, Biol. Centralbl. iii. p. 671.]

The following known species of *Nymphalidæ* are figured or specially noticed by Godman & Salvin, Biol. Centr. Am. *Lep. Rhop.* :—*Pyrrhogyra otolais*, Bates (= *neis*, Feld.), pl. xxvii. figs. 5 & 6; *Adelpha melanthæ*, Bates, pl. xxviii. figs. 1 & 2, *demialba*, Bates, pl. xxx. figs. 5 & 6, *sophax*, G. & S., figs. 1 & 2, *tizona*, Feld., fig. 11, pl. xxix., *salmoneus*, Butl., pl. xxviii. figs. 3 & 4, *leuceria*, Druce, pl. xxx. figs. 7 & 8, *fessonia*, Hew. (= *cestus*, Boisd.), figs. 18 & 19, *erotia*, Hew., figs. 14 & 15, *oberthueri*, Boisd., figs. 3 & 4, pl. xxix., *diocles*, G. & S., pl. xxx. figs. 3 & 4, *lerna*, Hew., pl. xxix. figs. 12 & 13, *phylaca*, Bates, pl. xxx. figs. 1 & 2, *pithys*, Bates, pl. xxviii. figs. 7 & 8, *basilea*, Cram. (figured as *A. epiphicla*, figs. 9 & 10), *iphicla*, Linn. (= *iphicleola*, Bates, figs. 11 & 12), *basiloides*, Bates (= *lydia*, Butl., and *leonina*, Feld.), figs. 15 & 16, *felderi*, Boisd. (= *falcata*, G. & S., figs. 13 & 14), pl. xxviii., *massilia*, Feld., pl. xxix. figs. 7 & 8, *paræca*, Bates (= *emathia*, Feld.), pl. xxviii. figs. 5 & 6; *Chorippe callianira*, Mén. (= *thauamas*, Bates), pl. xxx. figs. 9-11, *cyane*, Latr. (= *lucasi*, Doubl. & Hew., *laurentia*, Hew., and *mentas*, Boisd., ♀), pl. xxxi. figs. 1 & 2, *cherubina*, Feld. (= *laurentia*, Butl. & Druce, *nec* Godt.), pl. xxxi. figs. 3 & 4; *Doxocopa argus*, Bates, pl. xxx. figs. 12-14; *Prepona gnorima*, Bates, figs. 7 & 8; *Agrius ædon*, Hew., figs. 5 & 6, pl. xxxi.; *Aneæ nobilis*, Bates, pl. xxxv. figs. 1-3, *morta*, Druce (= *onophis*, Boisd., *nec* Feld., *iphis*, Butl. & Druce, *nec* Latr., and *morvus*, Druce, *nec* Fabr.), *indigotica*, Salv. (= *zelica*, Salv., and *chæronæa*, G. & S.), figs. 1-4, *xenica*, Bates, figs. 5 & 6, pl. xxxiii., *beatrice*, Druce (= *chæronæa*, Butl. & Druce), pls. xxxii. figs. 9 & 10, & xxxvi. figs. 9 & 10, *onophis*, Feld. (*nec* Boisd., = *eubæna*, Boisd.), pls. xxxii. figs. 1 & 2, & xxxiv. figs. 11 & 12, *pithyusa*, Feld., figs. 7 & 8, *xenocles*, Westw., figs. 5 & 6, pl. xxxii., *laura*, Druce, pl. xxxvi. figs. 4 & 5, *ambrosia*, Druce, pls. xxxvi. figs. 11 & 12, & xxxvii. figs. 6 & 7, *anassa*, Feld. (= *cleomestra*, Hew., and *ada*, Butl.), pl. xxxvi. figs. 1-4, *aureola*, Bates, pl. xxxvii. figs. 1-3, *jansonii*, figs. 4 & 5, *excellens*, Bates, figs. 6 & 7 and *callidryas*, Feld., figs. 8 & 9, pl. xxxv.

The following synonymy of other known species is given by Salvin & Godman, t. c. pp. 289-339 :—*Timetes coresia*, Godt. (= *zerynthia*, Hübn.), *hermione*, Feld. (= *heraldicus*, Bates, and *funestus*, Butl.); *Adelpha leucophthalma*, Latr. (= *mephistopheles*, Butl.), *uraca*, Feld. (= *loræa*, Boisd., and *plesasure*, Butl. & Druce), *cytherea*, Linn. (= *clea*, Cram.), *donyza*, Hew. (= *reila*, Boisd.), *celerio*, Bates (= *iphicla*, Cram.), *bredowii*, Hübn. (= *eulalia*, Doubl. & Hew.; *californica*, Butl., is hardly distinct), *Chlorippe pavonii*, Latr. (= *mentas*, Boisd., ♂), *laure*, Dru. (= *acca*, Feld., and *druryi*, Butl. & Druce), *linda*, Feld. (= *plesaurina*, Butl. & Druce, and

laura, Burm., nec Drury; *Prepona amphimachus*, Fabr. (= *meander*, Cram.); *Aganisthes orion*, Fabr. (= *danae*, Cram.); *Cœa cadmus*, Cram. (= *acherontu*, Fabr., and *pherecydes*, Cram.); *Smyrna blomfieldia*, Fabr. (= *proserpina*, Fabr., and *bella*, Godt.); *Siderone isidora*, Cram. (= *itys*, Cram.), *ellops*, Ménétr. (= *isidora*, G. & S.), *ide*, Hübn. (= *thebais*, Feld.); *Anœa chrysophana*, Bates (= *pyrrhothea*, Feld., and *helie*, Butl. & Druce), *echemus*, Doubl. & Hew. (= *Megalura poeyi*, Lef.).

The following known species from Nias are specially noticed and generally redescribed and figured; Kheil, Rhop. Nias, pp. 20-26:—*Cethosia gabinia*, Weym., pls. ii. fig. 6, & v. fig. 26; *Doleschallia bisaltide*, Cram. (note on flight); *Limenitis æmonia*, Weym., pl. iii. fig. 12; *Euthalia pyxidata*, Weym., pl. iv. fig. 20; and *Symphædra perdix*, Butl., pl. ii. fig. 10.

Weymer, J.B. Ver. Elberfeld, vi. pp. 65-77, describes and figures aberrations of *Apatura iris*, Linn., pl. ii. fig. 6 (and hermaphrodite, pl. i. fig. 2); *Limenitis sibylla*, Linn., ab. *nigrina*, figs. 4 & 5; *Vanessa polychloros*, Linn., ab. *testudo*, Esp., fig. 1, pl. ii.; *Melitea athalia*, Rott., fig. 7, and *Argynnis selene*, W. V., fig. 5, pl. i.

On hibernating *Vanessidæ*; Fletcher & Grote, Rep. E. Soc. Ent. 1883, pp. 31-33.

Short but important notes on the larvæ and pupæ of Brazilian *Nymphalidæ*; many young larvæ eat the space next to a vein of the leaf bare, and then lengthen the stalk by attaching particles of dirt to it; the movements of some pupæ when exposed to the light are also noticed: F. & W. Müller, P. E. Soc. 1884, p. xxiii.

Junonia orithyia, *anone*, *Precis lemonias*, Linn., *Hypolimnas avia*, and *Symphædra thyelia*, Fabr. Transformations noticed and larva and pupa of the last figured; Forsayeth, Tr. E. Soc. 1884, pp. 382-385, pl. xiv. figs. 3 & 3a.

Saalmüller, Lep. Mad. i., redescribes and figures *Precis rhadama*, Boisd., pl. i. figs. 4-6, p. 78, *Panopea apaturoides*, figs. 35 & 36, p. 82, *drucei*, Butl., fig. 34, pl. iii. p. 84, *Charaxes antamboulou*, Luc., pl. ii. figs. 24 & 25, p. 86. Saalmüller also, t. c. pp. 88 & 89, indicates *C. antanala*, Luc., as = *cacuthis*, Hew., and *C. andriba*, Ward, as = *betanimena*, Luc.

Agraulis juno, Cram., var. *huascama*. Reak. Transformations described; Schaus, Papilio, iii. pp. 187 & 188.

Argynnis euphrosyne, Linn., and *selene*, W. V.: on the second broods and mimicry; Bloomfield, Ent. M. M. xxi. pp. 87, 88, & 109. *A. euphrosyne*, variety noticed; White, Tr. Ess. Club, iii. p. lxxxvi. *A. freya*, Thunb.: character and object of markings discussed; Schilde, Ent. Nachr. x. pp. 6-9. *A. gainadeva*, Moore, structurally different from *adippe*, Linn.; Butler, Ent. M. M. xxi. p. 66. *A. polaris*, Boisd., noticed from Norwegian Finland; Aurivillius, Ent. Tidskr. v. pp. 203 & 230. *A. selene*, variety from Carlsbad described; Becher, Ent. xvii. p. 79.

Melitea maturna, Linn., var. *wolfensbergeri* from various parts of Europe described; *M. artemis*, W. V., and var. *merope*, De Prunn.; intermediate forms never occur: Frey, MT. schw. ent. Ges. vii. pp. 11 & 12 (for the former, cf. also Riggenbach-Stehlin, t. c. pp. 9 & 45). *M.*

artemis, W. V., variety noticed; White, *t. c.* p. lxxxvi. *M. chalcon*, Boisd.: transformations described, with remarks on the larva of *M. phaeton*, Dru.; W. H. Edwards, Papilio, iv. pp. 63-70. *M. cinxia*, Linn.: on rearing; Lehmann, Z. E. Ver. schles. (2) ix. pp. 23 & 24: albino from Sarepta noticed; Grumm-Grshimailo, in Romanoff's Mém. Lép. i. pp. 171 & 172. *M. cynthia*, W. V.: larva briefly described; Baker, Ent. M. M. xxi. p. 13. *M. parthenie*, Borkh.: on its occurrence in Nassau; Fuchs, S. E. Z. xlv. pp. 251 & 252.

Phyciodes. W. H. Edwards (*t. c.*) describes *P. nycteis*, Doubl. & Hew., var. *drusus* from Colorado and Arizona, *P. harrisii*, Scudd. (larva and variety; the species probably belongs to *Melitæa*), pp. 57 & 58, and *P. camillus* and *picta*, W. H. Edw. (transformations), pp. 128-131, and Canad. Ent. xvi. pp. 163-167.

Coatlantona janais, Dru. Transformations described; Schaus, *t. c.* p. 188. *Grapta interrogationis*, Fabr.: ♂ pupæ are dull, pale fuscous, without metallic markings; ♀ pupæ are golden brown, with eight pale golden spots: [Miss] M. E. Murtfeldt, Psyche, iv. p. 184. *G. progne*, Cram., sufficiently numerous in Canada in 1884 to be injurious; W. Saunders, Canad. Ent. xvi. p. 208.

Vanessa atalanta and *cardui*, Linn.: times of appearance; Jeffreys, Ent. xvii. p. 183. *V. atalanta* and *urticae*, Linn.: occurrence in the Botanic Gardens, Wellington, New Zealand; Kirk, Tr. N. Z. Inst. xvi. p. 530, and Ent. M. M. xxi. p. 87. *V. antiopa*, Linn.: hibernated pair observed in coitû; Schilde, *t. c.* pp. 141 & 142: note on pupation; Bean, Canad. Ent. xvi. p. 68: 145 parasites bred from a pupa; Harriet H. Keyes, Canad. Ent. xv. p. 237. *V. c-album*, Linn.: aberration described; Leprevost, Bull. Soc. Ent. Fr. (6) iv. pp. cxxv. & cxxvi. *V. cardui*: abundance in Ireland in 1883; De V. Kane, Ent. M. M. xxi. p. 134: migrations in France; Ébrard, Bull. Soc. Ent. Fr. (6) iv. pp. lxxii. & lxxiii.: migrations of larvæ in Hungary; Anker, Rov. Lapok, i. pp. 247-249 & xxx. *V. comma*, Harr. (injurious to hop): transformations briefly described; Riley, Bull. Dep. Agric. Ent. U. S. iv. p. 40. *V. io*, Linn.: aberrations; March & Turner, Ent. xvii. p. 17. *V. milberti*, Godt., pupating on Thursday night, and emerging by the following Tuesday; Fischer, Canad. Ent. xvi. pp. 16 & 17. *V. polychloros*, Linn.: anatomy of larva; François, Feuille. Nat. xv. pp. 2-6, pl. i. *V. urticae*: yellowish specimens noticed; Fuchs, *t. c.* p. 251.

Pyrameis gonerilla, Fabr.: habits noticed and larva described; Mathew, Ent. xvii. pp. 219-221. *P. cardui*, Linn.: abundance in North America in 1884, and notice of food-plants; W. Saunders, *t. c.* p. 211: injurious to hollyhock, &c., in America; Cook, Pract. Ent. pp. 18 & 19: var. from New Forest, approaching the Australian *P. kershawii*, M'Coy; Weir, P. E. Soc. 1884, p. xxvii.

Junonia cania, Hübn., noticed from Orono, Maine; [Mrs.] C. H. Fernald, Am. Nat. xviii. p. 77.

Cyrestis tabula, De Nicéville, figured by him; J. A. S. B. lii. pl. i. fig. 1.

Hypolimnas. Several species from Fiji noticed; Butler, Ann. N. H. (5) xiii. p. 345.

Diadema anthedon, Doubl., ♀ noticed; Godman & Salvin, P. Z. S. 1884, p. 223.

Hestina zella, Butl., ♀ described and figured; the butterfly mimics *Metaporia caphusa*, Moore: De Nicéville, t. c. pp. 65 & 66, pl. i. fig. 2.

Euripus cinnamomea, Wood-Mason, is possibly a dimorphic ♀ of *halitherthes*, Doubl. & Hew.; id. t. c. p. 94.

Limenitis arthemis, Dru.: times of appearance; [Mrs.] C. H. Henstis, Rep. E. Soc. Ont. 1883, pp. 37 & 38. *L. eros*, W. H. Edwards, noticed by him; Papilio, iv. p. 62: larvæ killed by lightning; [Miss] A. M. Wittfield, Canad. Ent. xvi. p. 180. *L. nefte*, Cram., noticed from Nias; Snellen, Tijdschr. Ent. xxvii. p. lxxxii. *L. populi*, Linn., and ab. *tremulæ* discussed; Schilde, t. c. pp. 370-372: habits at Carlsbad noticed; ♀ generally with a large piece out of hind wings, probably caused by birds; Becher, t. c. p. 78.

Athyma zeroa, Moore, ♀ described; De Nicéville, t. c. p. 94.

Aterica (?) *buchholzi*, Plötz, and *Paradiadema hora*, Dist., are sexes; Weymer, S. E. Z. xlv. p. 28.

Apatura bunca, Herr.-Schäff. (with aberration *metis*, Freyer), is quite distinct from *ilia*, W. V. (with its aberration *clytie*, W. V.); the former is common at Sarepta, and a new variety is noticed under the name of *calestina*: Grumm-Grshimailo, t. c. pp. 167-171. *A. iris*, Linn.: aberration from Hungary described and figured; Thiele, B. E. Z. xxviii. pp. 161 & 162. *A. lycaon*, Fabr., coming to light; [Miss] M. E. Murtfeldt, t. c. p. 206.

Prepona dexamenus, Hopff., noticed and figured; Honrath, B. E. Z. xxviii. p. 208.

Smyrna karwinskii, Hübn., and *blomfieldia*, Fabr. Transformations described; Schaus, Papilio, iv. pp. 101 & 102.

Charaxes jasius, Linn., noticed; Ragusa, Nat. Sicil. vii. p. 31.

New species :—

Cirrochroa lapaona and *lunulata*, Kheil, Rhop. Nias, pp. 20 & 21, pl. ii. figs. 7 & 8, Nias; *C. abnormis*, Moore, J. A. S. B. liii. p. 19, Darjiling.

Cynthia orabilia, Kheil, t. c. p. 21, pl. ii. fig. 9, Nias.

Atella propinqua, Miskin, Tr. E. Soc. 1884, p. 94, Rockingham Bay.

Argynnis gong [!], Oberthür, Études d'Ent. ix. p. 15, pl. ii. fig. 9, Thibet; *A. lais*, W. H. Edwards, Canad. Ent. xv. p. 209, Red Deer River.

Melitæa chara, id. *ibid.*, and *nympha*, id. Papilio, iv. p. 53, S. Arizona.

Junonia here, Lang, Ent. xvii. p. 207, and Butt. Eur. i. p. 373, Bagdad, Aden.

Doleschallia niassica, Butler, Ann. N. H. (5) xiii. p. 59, Nias.

Ergatis tapestrina and *indica*, Moore, t. c. pp. 19 & 20, India.

Callicore panthalis and *merida*, Honrath, B. E. Z. xxviii. p. 209, pl. vii. figs. 7, 7a, & 8, Venezuela.

Callithea srnkai, id. t. c. p. 208, pl. vii. figs. 6 & 6a, Pebas.

Pyrrhogyra hypsenor, Godman & Salvin, Biol. Centr. Am. Lep. Rhop. i. p. 292, pl. xxvii. figs. 3 & 4, British Honduras, Guatemala.

Chersonesia peraka, Distant, Ann. N. H. (5) xiv. p. 199, Perak.

Cyrestis fadorensis, Kheil, *t. c.* p. 22, pl. iii. fig. 11, Nias; *C. themire*, Honrath, *t. c.* p. 398, pl. x. fig. 5, Perak.

Hypolimnas holdeni, Butler, Mem. Nat. Ac. Sci., Rep. Eclipse Exped. p. 93, Caroline Island.

Diadema mechowii, Dewitz, B. E. Z. xxviii. p. 187, pl. i. fig. 2, Quango.

Pseudacræa gottbergi, *id. ibid.* fig. 1, Quango; *P. colvillei*, Butler, Ann. N. H. (5) xiv. p. 123, and Waterhouse, Aid, iii. pl. cl. fig. 1, Natal.

Adelpha melanippe, Colombia, p. 296, note, *erymanthis*, figs. 5 & 6, Nicaragua, Costa Rica, p. 302, *sentia*, figs. 9 & 10, British Honduras, and *pione*, figs. 16 & 17, Panama, p. 309, Godman & Salvin, *t. c.* pl. xxix.

Limenitis cottini, Oberthür, Études d'Ent. ix. p. 17, pl. ii. fig. 5, Thibet; *L. elwesi*, *id.* Bull. Soc. Ent. Fr. (6) iii. p. cxxviii., and Études d'Ent. ix. p. 15, pl. ii. fig. 4, Yunnan.

Neptis dahana, pl. v. fig. 27, *ilira*, figs. 13 & 14, and *ombalata*, figs. 15 & 16, pl. iii., Kheil, *t. c.* p. 24, Nias.

Athyma adunora and *glora*, *id. t. c.* p. 25, pl. iii. figs. 17 & 18, Nias.

Euthalia andersonii, Moore, *t. c.* p. 18, Mergui, Tavoy.

Tanaecia nicevillei, Distant, *t. c.* p. 199, Perak.

Symphædra perdix, Butler, Ann. N. H. (5) xiii. p. 59, Nias.

Apatura cocles, Lintner, Papilio, iv. p. 141, Texas.

Chlorippe felderi (= *zunilda*, var. Feld.), Panama to Peru, p. 313, and *burmeisteri* (= *lucasii*, Burm., nec Doubl.), Argentine Republic, p. 317, note, Godman & Salvin, *t. c.*

Prepona neoterpe, Honrath, *t. c.* p. 207, pl. vi. figs. 5 & 5a, Chanchamayo; *P. camilla*, *demophon*, pl. xxxi. figs. 9 & 10, Nicaragua, Panama, and *phædra*, Panama, Godman & Salvin, *t. c.* pp. 321 & 322.

Pycina zelys, *iid. t. c.* p. 331, Costa Rica, Panama.

Charaxes andranodorus and *zoippus*, Mabille, C.R. ent. Belg. xxviii. pp. clxxxiv. & clxxxv., Madagascar; *C. hamatus*, Dewitz, Ent. Nachr. x. p. 285, W. Africa; *C. durnfordi*, Distant, Ent. xvii. p. 191, Malay Peninsula; *C. kaba*, Kheil, *t. c.* p. 27, pl. iii. fig. 19, Nias.

Prothoe semperi, Honrath, *t. c.* p. 204, pl. ii. figs. 1 & 1a, Mindanao.

Hypna forbesi, Godman & Salvin, *t. c.* p. 357, note, Brazil.

Siderone polymela, *id. t. c.* p. 334, Panama.

Anæa promenæa, pl. xxxiv. figs. 1 & 2, Mexico, p. 343, *perenna* (= *amenophis*, Druce, nec Feld.), pl. xxxii. figs. 3 & 4, Guatemala to Lower Amazons, p. 344, *forreri*, pl. xxxiv. figs. 3 & 4, Mexico, p. 350, *orthesia* (= *mora*, Druce), figs. 11 & 12, Guatemala, *dia*, figs. 7 & 8, Panama, p. 350, and *opalina* (figured as *callidryas*, figs. 9 & 10), p. 354, Chiriqui, *iid. t. c.* pl. xxxii.; *A. dominicana*, *iid.* P. Z. S. 1884, p. 316, pl. xxv. fig. 1, Dominica.

MORPHIDÆ.

Amathusia dilucida, sp. n., Honrath, B. E. Z. xxviii. p. 206, pls. iii. fig. 3, iv. fig. 3b, & v. fig. 3a, Malacca, Sarawak.

Zeuxidia sibulana, sp. n., *t. c.* p. 205, pls. ii. fig. 2, iii. fig. 2a, & iv. fig. 2b, Mindanao.

SATYRIDÆ.

Romanoff, Mém. Lép. i. pp. 59-65, notices and figures *Melanargia lurissa*, Herr.-Schäff., var. *astanda*, Nordm., pl. i. figs. 5 & 6, *Satyrus pelopeu*, Klug, varr. *shahrudensis*, Staud., figs. 1 & 2, and *persica*, Staud., figs. 3 & 4, *S. alpina*, Staud., figs. 5 & 6, pl. ii., *mamurra*, Herr.-Schäff., var. *shahkuhensis*, Staud., figs. 1-3, *parisatis*, Koll., figs. 4 & 5, pl. iii., *Pararge mæra*, Linn., var. *adrastoides*, Bien., pl. i. fig. 7 (*P. nashredini*, Christoph, is noted as = *menava*, Moore), *Canonympha saadi*, Koll., figs. 6 & 7, and *symphita*, Led., figs. 8 & 9, pl. iii.

Melanitis ismene, Cram.: habits and transformations noticed, and larva and pupa figured; Forsayeth, Tr. E. Soc. 1884, p. 382, pl. xiv. figs. 2 & 2a, b. *M. libya*, Distant, noticed and figured by him; Tr. E. Soc. 1884, pp. 89 & 90, pl. iii. fig. 5.

Erebia. Oberthür, Études d'Ent. viii. pp. 19-26, pl. i., gives a list of Pyrenean species, and specially notices the following:—*E. melas*, Esp., varr. *astur*, Oberth., fig. 12, *melas*, *hungarica*, *pyrenæa*, and *intermedia*, Oberth., and *lefebvrei*, Dup.; *manto*, Hübn., and var. *sthenyo*, Grasl., gorge, Esp., var. *gigantea*, fig. 7, *gorgone*, Reichl., and *tyndarus*, Esp. *E. eriphyle*, Freyer: localities and dates of capture in Switzerland; Christ, MT. schw. ent. Ges. vii. pp. 28 & 29 (cf. also Riggenbach-Stehlin, *sp. cit.* p. 45). *E. æme*, Hübn., var. *spodia*, Staud.: transformations described; Rogenhofer, Verh. z.-b. Wien, xxxiv. pp. 153 & 154.

Argyrophenga antipodum, Doubl. Habits noticed; Mathew, Ent. xvii. pp. 248 & 249.

Chionobas jutta, Hübn., noticed from Orono, Maine; [Mrs.] C. H. Fernald, Am. Nat. xviii. p. 77. *C. norna*, Thunb., recorded from the neighbourhood of Stockholm; Holmgren, Ent. Tidskr. v. pp. 96 & 205.

Æneis bore, Schneid. Note on transformations; Sandberg, Ent. Tidskr. v. p. 139.

Pararge megæra, Linn. Fight between two males; Aurivillius, Ent. Tidskr. v. pp. 53 & 91.

Epinephile janira, Linn.: aberration described and figured; Pävel, Rov. Lapok, i. pp. 185, 186, & xxiv., fig. 41: hermaphrodite noticed (right side ♂, left ♀); Kempelen, t. c. pp. 126 & xvi. *E. hyperanthus*, Linn., and abb. *cæca*, Fuchs, and *arete*, Mull., discussed; Fuchs, S. E. Z. xlv. pp. 252-254. *E. comara*, Led., is a local form of *davendra*, Moore; Christoph, in Romanoff's Mém. Lép. i. p. 105.

Satyrus. Remarks on the North American species, with notes on those collected by the N. Transcontinental Survey in 1882; J. B. Smith, Bull. Brooklyn Soc. vi. pp. 125-135. The synonymy is given as follows:—Group 1, *wheeleri*, Edw. (= *hoffmani*, Streck.), 2, *alope*, Fabr., form *pegala*, Fabr., form *alope*, Fabr., varr. *maritima* and *texana*, Edw., form *nephela*, Kirb., var. *boopis*, Behr (= *incana*, Edw.), and varr. *olympus*, Edw., *ariane*, Boisd., and *gabbii*, Edw., 3, *meadii*, Edw., 4, *sthenela*, Boisd., and var. *paulus*, Edw., 5, *baroni*, (Edw., and 6, *silvestris*, Edw. (= *ætus*, Boisd.), and var. *charon*, Edw. (= *phocus*, Edw.). *S. semele*, Linn., and var. *aristeus*, Bon., discussed; Santos, J. Sci. Lisb. x. pp. 37, 147, & 148.

Mycalesis ankaratra, figs. 28 & 29, and *antahala*, Ward, figs. 26 & 27,

redescribed and figured; Saalmüller, *Lep. Mad.* i. pp. 93 & 95, pl. ii. *M. polydecta*, Cram. (*nec* Butl., which = *mineus*, Linn., var.), redescribed and figured; De Nicéville, *Tr. E. Soc.* 1884, pp. 87-89, pl. iii. figs. 1 & 2 (fig. 3 represents *M. langi*, De Nic., figured for comparison).

Ypthima itonia, Hew.: variation noticed; Godman & Salvin, *P. Z. S.* 1884, p. 220. *Y. ypthimoides*, Moore (= *robinsoni*, Dist.), noticed and figured; Distant, *t. c.* p. 89, pl. iii. fig. 4.

Triphysa phryne, Pall. Hermaphrodite noticed; Grumm-Grshimailo, in Romanoff's *Mém. Léop.* i. p. 172.

Dodonidia, g. n., Butler, *Ann. N. H.* (5) xiii. p. 172, and *N. Z. J. Sci.* ii. p. 159. Allied to *Argynnina*, but with a superficial resemblance to *Dodona*. Type, — *helmsi*, Ferch. (figured, *t. c.*).

New species:—

Erebia radians and *tianchanica*, Lang, *Butt. Eur.* p. 320, Kulja.

Melanargia epimede, Amur, Japan, and *mauritanica*, Algeria, *id. t. c.* p. 315.

Pararge epaminondas, *id. t. c.* p. 328, Amur.

Epinephile bieti, Oberthür, *Études d'Ent.* ix. p. 17, pl. ii. fig. 2, Thibet.

Satyrus wilkinsi and *abramovi*, Erschoff, *Hor. Ent. Ross.* xviii. pp. 244 & 245, Kashgar; *S. cordulina*, Lang, *t. c.* p. 325, Samarcand.

Mycalesis benacus, Mabille, *C.R. ent. Belg.* xxviii. p. clxxxv., Madagascar; *M. evanescens*, Saalmüller, *Lep. Mad.* i. p. 91, Nossi-Bé.

Ypthima malratta, Deccan, p. 16, *apicalis*, Deyra Dhoon, *kasmira*, Kashmir, *howra*, Calcutta, p. 17, and *horsfieldii*, Java, p. 18, Moore, *J. A. S. B.* liii.; *Y. beautei*, Oberthür, *t. c.* p. 18, pl. ii. fig. 1, Thibet.

ERYCINIDÆ.

Dodona. Habits, &c.; De Nicéville, *J. A. S. B.* lii. pp. 94 & 95.

Stiboges nymphidia, Butl. Description and figure reproduced; Distant, *Rhop. Mal.* p. 193, pl. xxiv. fig. 11.

Lasaia militaris, Hopff., = *Siseme luculenta*, Ersch.; Weymer, *S. E. Z.* xlv. p. 27.

LYCÆNIDÆ.

Distant, *Rhop. Mal.* p. 197, divides the Malayan *Lycænidae* into 3 groups, as follows:—

“Posterior wings without filamentous tail-like appendages near the anal angle CURETARIA.

“Posterior wings with minute filamentous or prominent tail-like appendages near the anal angle.

“Posterior wings convex, about as broad as long CASTALARIA.

“Posterior wings more or less elongate, distinctly longer than broad APIINARIA.”

The following genera are referred to these groups:—

CURETARIA: *Poritia*, *Curetis*, *Liphyra*, *Gerydus* [*Paragerydus*], *Logania*, *Allotinus*, *Cyaniris*, *Neopithecops*, *Zizera*.

CASTALARIA: *Castalius*, *Everes*, *Nacaduba*, *Jamides*, *Catochrysops*, *Lampides*, *Polyommatus*, *Lycænesthes*.

APHNARIA: *Catapæcilma*, *Drupadia*, *Biduanda*, *Semanga*, *Dacalana*, *Jaccona*, *Spindasis*, *Tajuria*, *Bindahara*, *Neomyrina*, *Purliisa*, *Cheritra*, *Sithon*, *Hypolycænâ*, *Iraota*, *Narathura*, *Panchala*, *Amblypodia*, *Rapala*, *Deudorix*, and *Loxura*.

Woodcuts of neururation and other structural characters of different genera are frequently given.

The following known species are figured and redescribed by Distant, Rhop. Mal.:—*Poritia sumatra*, Feld., pl. xxii. figs. 2 & 3, and (var. ?) pl. xx. fig. 12, p. 198, *phraatica*, Hew., pls. xxi. fig. 21, & xxiv. fig. 8, *pleurata*, Hew., pl. xxii. figs. 5 & 6, p. 199, *phalena*, Hew., fig. 8, *pheretia*, Hew., figs. 9 & 10, *pediada*, Hew., fig. 16, p. 200, and *potina*, Hew., fig. 7, p. 201, *Curetis malayica*, Feld., fig. 28, pl. xxii., *æsupus*, Fabr., pl. xxiv. fig. 12, p. 202, *sperthis*, Feld., fig. 27, p. 203, *Liphyra brassolis*, Westw., fig. 18, pl. xxii. p. 204, *Gerydus symethus*, Cram., pls. xx. fig. 2, & xxii. fig. 14 (its reputed occurrence in ants' nests is probably an error), p. 205, *Allostinus unicolor*, Feld., p. 209, *Cyaniris lambi*, Dist., fig. 22, *haraldus*, Fabr., fig. 6, pl. xxi. p. 211, *Zizera lysizone*, Snell., pl. xx. fig. 9, p. 212, *karsandra*, Moore, fig. 22, p. 213, *Castalius rosimon*, fig. 20, p. 215, *ethion*, Doubl. & Hew., fig. 25, *rozus*, Godt., fig. 24, pl. xxii. p. 216, *elna*, Hew., fig. 4, *Nacaduba macrophthalma*, Feld., fig. 3, *beroe*, Feld., figs. 16 & 17, *viola*, Moore, fig. 24 (and woodcut, fig. 65), p. 219, *aluta*, Druce, figs. 13 & 14, *almora*, Druce(?), fig. 22, pl. xx. p. 220, *Nacaduba* sp., pl. xxi. fig. 7, *Everes parrhasius*, Fabr., p. 221, *Jamides bochus*, Cram., var., figs. 16 & 19, p. 222, *Catochrysops strabo*, Fabr., figs. 8 & 14, p. 224, *cnejus*, Fabr., fig. 2, *pandava*, Horsf., fig. 17, p. 225, *Lampides elpis*, Godt., figs. 25 & 26, pl. xxi. p. 226, and var. *pseudelpis*, Butl., pl. xx. figs. 27 & 28, *ælianus*, Fabr., pls. xxi. fig. 18, & xxii. fig. 19, and var. *agnata*, Druce, p. 228, *kankena*, Feld., pl. xx. figs. 11 & 18, p. 229, *Lampides* sp., pl. xxi. fig. 24, *Polyommatus baticus*, Linn., pl. xx., figs. 1 & 8, p. 230, *Lycænesthes lycænina*, Feld., pl. xxi. fig. 3, p. 232, *Catapæcilma elegans*, Druce, pl. xxii. fig. 17, p. 235, *Drupadia moorei*, Dist., pl. xx. figs. 20, 21, & 30, p. 236, *Spindasis syama*, Horsf., figs. 8 & 9, p. 243, *Tajuria longinus*, fig. 20, pl. xxiii. p. 244, *mantra*, Feld., pl. xxi. fig. 11, p. 245, *travana*, Hew., pl. xxii. fig. 4, p. 246, and *Bindahara phocides*, Fabr. (nec Moore), pl. xx. fig. 25.

De Nicéville, J. A. S. B. lii., notices, and often redescribes and figures, *Cyaniris placida*, fig. 8, *dilectus*, fig. 5 (*puspa*, Horsf., figured at 5a), *iynteana*, figs. 7 & 7a, *transpectus*, figs. 6 & 6a, *marginata*, fig. 9, and *albocæruleus*, figs. 4 & 4a (all of Moore), pp. 67-72, *Nacaduba nora*, Feld., fig. 14, p. 73, *Castalius interruptus*, Moore, fig. 12, p. 74, *Miletus hamada*, Druce, fig. 16, p. 76, pl. i., *Hypolycænâ nasaka*, Horsf., fig. 2, and *chandana*, Moore, fig. 1, pp. 77 & 78, *Nilasera* (?) *fulgida*, Hew., figs. 3 & 3a, p. 80, pl. ix., *Iolaus maculatus*, Hew., ♂, p. 93, note, *Curetis bulis*, Doubl. & Hew., ♀ dimorphism, p. 95, *Horaga viola*, Moore, ♀, and *H.* sp. (= *Myrina onyx*, p., Hew.), pp. 96 & 97, and *Nilasera* (?) *ariste*, Hew., ♂, p. 97.

Thecla rubi, Linn., *Polyommatus virgaureæ*, Linn., *chryseis*, W. V., and var. *eurybia*, Ochs., *alciphron*, Rott., and var. *gordius*, Sulz., *circe*, W. V.,

and var. *montana*, Meyer-Dür, *phlaeas*, Linn., var. *americanus*, D'Urban, from Norway, and *pavona*, Horsf., from Kashmir, *Lycæna argus*, Linn., *icarus*, Rott., and several other *Lycænæ*. Variation, &c., discussed; Schilde, Ent. Nachr. x. pp. 346, 358-362, & 365-370.

Miletus symethus, Cram., noticed from Nias; Snellen, Tidschr. Ent. xxvii. p. lxxxii.

Lycæna. Oberthür, Études d'Ent. viii. pp. 15-18, pl. i., notices from the Pyrenees, *L. egon*, Hübn., and *argus*, Linn.; *L. hypochiæna*, Ramb., is an Andalusian form of *egon*; *L. calliopis*, Boisd., is distinct; *L. pyrenaica*, Boisd., is a good species (figs. 10 & 11); *orbitulus*, Hübn., figs. 8 & 9, and *eros*, Ochs., ab. *cerulescens*, fig. 4. *L. christophi*, *zephyrinus*, and *miris*, Staud., noticed and figured; Christoph, Romanoff's Mém. Lep. i. pp. 102 & 103, pl. vi. figs. 2a, b, 3a, b, & 4. *L. acis*, W. V.: varieties noticed from Carlsbad; Becher, Ent. xvii. p. 78. *L. alexis*, W. V.: occurrence in the Orkneys; Briggs, Ent. xvii. p. 198. *L. amyntula*, Boisd.: transformations described; Wright, Papilio, iv. pp. 126-128. *L. argiolus*, Linn.: variation in width of border; Lang, Ent. xvii. p. 232: specimen with angulated hind wings; Bishop, Ent. xvii. pp. 41 & 42: various forms discussed; *L. pseudargiolus*, Boisd. & Lec., is hardly distinct; Weir, Ent. xvii. pp. 193-197. *L. argus*, Linn., pupating under the bark of a pine tree among a colony of *Lasius niger*, Linn.; Aurivillius, Ent. Tidskr. v. pp. 190 & 227. *L. arion*, Linn.: on its probable extinction in England; Goss, Ent. M. M. xxi. pp. 107-109, Bignell, Ent. xvii. pp. 208 & 209, and Biguell & Smith, Ent. M. M. xxi. pp. 87, 133, & 134: aberration noticed; White, Tr. Ess. Club, iii. p. lxxxvii. *L. dardalus*, Behr (= *achaja*, Behr, and *rufescens*, Boisd.), discussed and redescribed; W. H. Edwards, Canad. Ent. xvi. pp. 2-6. *L. eros*, Ochs., var. *amor* from Samarcand described; Lang, Butt. Eur. p. 371. *L. medon*, Rott. (= *astrarche*, Bergstr.), var. from Zeeland, approaching *salmacis*, Steph., noticed by Ter Haar, and Snellen discusses and tabulates the various forms of this species; Tijdschr. Ent. xxvii. pp. 134-136: ab. *æstiva*, Staud., discussed; Fuchs, S. E. Z. xlv. pp. 250 & 251. *L. melissa*, W. H. Edwards: transformations described by him; Papilio, iv. pp. 91-93. *L. orbitulus*, De Pruun., variety from the Valais noticed; Frey, MT. schw. ent. Ges. vii. p. 11. *L. pseudargiolus*, Boisd. & Lec.: transformations, life-history, and varieties (*lucia*, Kirb., *marginata*, *violacea*, *nigra*, *cinerea*, and *neglecta*, Edw., *piasus*, Boisd., and *echo*, Edw.) fully described and figured; Edwards, Butt. N. Am. ii. *Lycæna*, pls. ii. & iii.

Plebeius balliston, Hübn., is not American; Kheil, Rhop. Nias, p. 28.

Thestor romanovi, Christoph, noticed and figured; Romanoff, Mém. Léop. i. p. 48, pl. i. figs. 1 & 2.

Polyommatus thersamon, Esp., var., and *P. asabinus*, Herr-Schaff, var. *satrapæ*, Staud., and *alciphron*, Rott., var. *melibæus*, Staud., noticed, and the two last figured; id. t. c. pp. 49 & 50, pl. i. figs. 4 & 3. *P. alciphron*, Rott., var. from Carlsbad described; Becher, t. c. p. 77. *P. chryseis*, W. V., variation in the Pyrenees; Oberthür, t. c. p. 14. *P. hippothoe*, Linn., var. *confluens*, Gerh., noticed; Van Segvelt, C.R. ent. Belg. xxviii. p. clxxx. *P. phlaeas*, Linn., variety noticed; Lushy, Ent. xvii. p. 23: var. *eleus*, Fabr., noticed; Van Segvelt, t. c. pp. cclxxx. & cclxxxi.: ab. *schmidtii*,

Gerh. (*albicans*), redescribed; Fuchs, *t. c.* pp. 249 & 250. *P. xanthe*, Fabr., var. *bleusii* from Madrid described; Oberthür, *t. c.* p. 15, note.

Chrysophanus thoe, Boisd. & Lec. Dates of pupation, &c.; Bean, Canad. Ent. xvi. p. 68.

Thecla ilicis, Esp., and var. *cerri*, Hübn., noticed; Oberthür, *t. c.* p. 14. *T. niphon*, Hübn.: variation, eggs, &c., noticed; Fletcher, Canad. Ent. xvi. pp. 92-94. *T. spini*, W. V.: habits, localities, &c.; Fuchs, *t. c.* pp. 248 & 249.

Cigaritis zohra, Donzel, figs. 8 & 9, var. *jugurtha*, Oberth., figs. 6 & 7, from Algeria, redescribed and figured; Oberthür, *op. cit.* ix. p. 35, pl. iii.

Iolus, Hübn., recharacterized, with *Papilio helius*, Fabr., as type; Moore, J. A. S. B. liii. p. 34.

Purlisa, Distant, briefly differentiated by him from allied genera; Rhop. Mal. p. 234.

Hypolycaena, Feld., recharacterized, with *H. tmolus*, Feld., as type; will also include *H. sipylus*, *tharrytas*, *astyla*, Feld., *andamana*, Moore, *Polyommatus erylus*, Godt., and *Myrina thecloides*, Feld.; Moore, *t. c.* p. 29. *H. philippus*, Fabr.: Saalmüller, Lep. Mad. p. 104, notes the following synonyms:—*Iolus orejus*, Hopff., *Amblypodia erylus*, Trim., and *Cupido ramonza*, Saalm. *Lycæna rube*, Boisd., = *H. phidias*, Fabr.: *id. t. c.* p. 105.

Sithon inopinata, Butl. (? = *martina*, Hew.), noticed; Kheil, *t. c.* p. 32.

New genera and species:—

Paragerydus, Distant, Rhop. Mal. p. 207, fig. 60 (posterior leg). Differs from *Gerydus* in having the first joint of the tarsi greatly elongated, but not widened and compressed as in *Gerydus*; ♀ with outer margin of posterior wings dentately sinuate. To include *Miletus horsfieldi*, Moore (type), pl. xx. fig. 7, and *M. nivalis*, Druce, pl. xxii. fig. 11.

Logania, *id. t. c.* pp. 197 & 208, fig. 61 (posterior leg). Allied to *Gerydus*, but basal joint of tarsi normal; apices of tibiæ globosely incrassated. Type, *L. malayica*, sp. n., *ibid.* pl. xxii. fig. 21, Malay Peninsula. Add *L. substrigosa*, *marmorata*, and *andersonii*, spp. nn., Moore, J. A. S. B. liii. p. 22, Mergui.

Neopithecops, Distant, *t. c.* pp. 197 & 209. Differs from *Cyaniris* in first subcostal nervure of anterior wings being emitted before end of cell. Type, *Pithecops dharma*, Moore. Add *N. horsfieldi*, sp. n., *t. c.* p. 210, pl. xxii. fig. 15, Singapore.

Biduanda, *id. t. c.* pp. 233 & 237. Differs from *Drupadia* in having four subcostal nervules to the anterior wings. To include *Myrina thesmia*, Hew. (type), woodcuts, figs. 76 & 77, and *lapithis*, Moore, pl. xx. fig. 29.

Semanga, *id. t. c.* pp. 233 & 239. Allied to *Catapæcilma*, but with an additional subcostal nervule to the anterior wings. Type, *Ilerda* (?) *superba*, Druce (figured, pl. xxi. fig. 13).

Jacoona, *id. t. c.* pp. 233 & 241. Placed after *Dacalana*; fore wings with four subcostal nervules, the first anastomosed with costal nervure. Type, *Myrina anasuja*, Feld. (figured, pl. xxi. fig. 15).

Neomyrina, *id. t. c.* pp. 234 & 248. Allied to *Purlisa*, but with a long tail-like appendage at apex of lower median nervule, and a short one at

apex of submedian nervure. Type, *Myrina hienalis*, Godm. & Salv. (figured, pl. xxii. fig. 13).

Pathalia, Moore, J. A. S. B. liii. p. 21. Allied to *Megisba*; fore wing rather longer and less regularly triangular, hind wings somewhat narrower, with a slender tail at end of lower median vein, second joint of palpi shorter, third joint longer and more slender. Type, *P. albifusca*, sp. n., *ibid.*, Chittagong, Orissa, N.W. Himalaya. Add *Lycæna malaya*, Horsf.

Euspa, *id.* t. c. p. 29. Placed after *Aphnæus*. Type, *Myrina milionia*, Hew.

Drupadia, *id.* t. c. p. 31. Allied to *Hypolycæna*; fore wings more triangular. Type, *Myrina ravindra*, Horsf.; will also include *Papilio livius*, Fabr., and *D. boisduvalii* (= *Myrina livius*, Boisd., nec Fabr.), Moulmein, Mergui, and *fabricii*, Mergui, spp. nn., t. c. pp. 31 & 32.

Chliaria, *id.* t. c. p. 32. Placed after *Drupadia*. Type, *Hypolycæna othona*, Hew.; will also include *H. eltola* and *kina*, Hew., and *chandrana*, *cachara*, and *nilgirica*, Moore.

Sinthusia, *id.* t. c. p. 33. Type, *Thecla nasaka*, Horsf.; includes also *T. malika*, Horsf., and *Hypolycæna grotei*, Moore.

Cophanta, *id.* t. c. p. 35. Placed after *Iolaus*. To include *I. illurgia* (type) and *maculatus*, Hew.

Dacalana, *id.* t. c. p. 36, and Distant, Rhop. Mal. pp. 233 & 240. Allied to *Iolaus*; fore wings more triangular. To include *Amblypodia vidura*, Horsf. (type; figured by Distant, Rhop. Mal. pl. xx. fig. 27), *Iolaus cotys*, Hew., and *D. burmana*, sp. n., Moore, t. c., Moulmein.

Remelana, *id.* t. c. p. 37. Allied to *Tajuria*; fore wings less triangular. To include *Amblypodia jangala*, Horsf. (type), and *Myrina travana*, Hew.

Apporasa, *id.* t. c. p. 38. Allied to *Thaduka*, but fore wings with the exterior margin biangulated and produced outwards below the apex. Type, *Amblypodia atkinsoni*, Hew.

Satadra, *id.* *ibid.* Fore wings comparatively longer and narrower than in typical *Panchala*. To include a large number of species described under *Amblypodia* by Hewitson and others, *A. atroz*, Hew., being taken as the type; also *S. canaraica*, Canara, *chola*, p. 39, *lazula*, Sikkim, *patana*, Nepal, p. 40, spp. nn., t. c.

Acesina, *id.* t. c. p. 41. Allied to *Panchala*. Type, *Amblypodia paraganesa*, De Nicév. (= *ganesa*, Hew., nec Moore).

Darasana, *id.* t. c. p. 42. Placed after *Acesina*. Type, *Amblypodia perimula*, Moore; add *D. newara*, sp. n., *ibid.*, Nepal.

Liptena homeyeri, Dewitz, B. E. Z. xxviii. p. 188, pl. i. figs. 3 & 3a, W. Africa.

Lucia fangola, Kheil, Rhop. Nias, p. 28, pl. v. fig. 31, Nias.

Pseudodipsas brisbanensis, Miskin, Tr. E. Soc. 1884, p. 95, Brisbane.

Curetis felderi, Distant, Rhop. Mal. p. 203, pls. xxii. fig. 26, & xxiv. fig. 3, Malay Peninsula.

Miletus lahomius, Kheil, t. c. p. 27, pl. v. figs. 28 & 29, Nias.

Gerydus biggsii, Distant, t. c. p. 206, pl. xxii. fig. 12, Malacca; *G. boisduvalii* (= *Symethus pandu*, Boisd., nec Horsf.) Amboina, and *stygianus*, Ternate, Butler, Ann. N. H. (5) xiii. p. 194.

- Allotinus aphocha*, Kheil, *t. c.* p. 28, pl. v. fig. 30, Nias.
- Lycæna iris*, Samarcand, p. 369, *pretiosa*, Morgelan, *anthracina*, Kulja, *versmanni*, Samarcand, p. 370, *gigas* (? = *lowei*, var.), Taurus, p. 371, *phyllis*, N. Persia, and *phryxis*, Samarcand, p. 372, Lang, Butt. Eur.; *L. allardi*, Oberthür, Études d'Ent. ix. p. 35, pl. iii. fig. 16, Algeria; *L. benigna*, Möschler, Verh. z.-b. Wien. xxxiii. p. 285, pl. xvi. fig. i, Caffraria; *L. perparva*, p. 93, *quadriocularis*, figs. 7 & 8, p. 100, and *cæruleoarcuata*, figs. 9-11, p. 102, Saalmüller, Lep. Mad i. pl. i., Nossi-Bé; *L. afra*, W. H. Edwards, Canad. Ent. xv. p. 211, British America; *L. mangoensis*, Butler, *t. c.* p. 347, Fiji; *L. chamanica*, p. 23, *bilucha*, Chaman, and *nadira*, Cabul, p. 24, Moore, J. A. S. B. liii.; *L. (?) leela* [sic], De Nicéville, J. A. S. B. lii. p. 66, pl. i. figs. 3 & 3a, Ladak.
- Parapithecopa gaura*, Moore, *t. c.* p. 20, Calcutta, Assam.
- Megisba sikkima*, *id. t. c.* p. 21, Sikkim.
- Plebeius talinga*, figs. 32 & 33, *kupu*, fig. 34, *polysperchinus*, fig. 36, p. 29, *siraha*, fig. 35, and *puspinus*, figs. 37-39, Kheil, *t. c.* p. 30, Nias.
- Cyaniris placida* (Moore, MS.), fig. 8, Sikkim, Upper Assam, p. 68, *inyntana* (Moore, MS.), figs. 7 & 7a, p. 69, *marginata* (Moore, MS.), fig. 9, Sikkim, Darjiling, p. 70, and *chennellii*, fig. 10, Assam, p. 72, De Nicéville, *t. c.*
- Castalius interruptus* (Moore, MS.), Orissa, Bengal, Sikkim, fig. 12, and *ananda*, Sikkim, Mysore, figs. 11 & 11a, *id. t. c.* pp. 74 & 75, pl. i.
- *Niphanida (?) cymbia*, *id. t. c.* p. 76, pl. ix. figs. 8 & 8a, Sikkim.
- Nacaduba bhutea*, Darjiling, Sikkim, and *N. (?) dana*, Sikkim, Chittagong, *id. t. c.* pp. 72 & 73, pl. i. figs. 13 & 15.
- Jamides woodfordii*, *campanulata*, p. 346, *lobelia*, Fiji, p. 347, *pulcherima* and *morphoides*, New Hebrides, p. 347, note, Butler, *t. c.*
- Theritas oakesii*, Butler, *op. cit.* xiv. p. 267, Colombia.
- Catochrysops trifracta*, *id. op. cit.* xiii. p. 194, Rat Island, Straits of Malacca.
- Lampides atherialis*, *id. t. c.* p. 195, Ké Dulan.
- Lycanesthes orissica*, Orissa, and *merguiana*, Mergui, Moore, *t. c.* p. 23.
- Chrysophanus baralacha*, *id. t. c.* p. 25, Ladak; *C. florus*, W. H. Edwards, *t. c.* p. 210, British America.
- Polyommatus sultan*, Lang, *t. c.* p. 368, Samarcand.
- Hypochrysops hecalius*, Miskin, *t. c.* p. 94, Victoria.
- Iolaus bagus*, Kheil, *t. c.* p. 31, pl. v. fig. 41, Nias.
- Aphæus nyassa*, Lake Nyassa, and *victoria*, Victoria Nyanza, Butler, Ent. M. M. xx. pp. 250 & 251; *A. tigrinus*, Lower Bengal, p. 25, *peguanus*, Pegu, *himalayanus*, Nepal, Darjiling, *khurdanus*, Orissa, Calcutta, p. 26, *orissanus*, Orissa, *concanus*, Bombay, Canara, Nilgiris, *nipalicus*, Nepal, Sikkim, p. 27, *zebrinus*, Ceylon, *lilacinus*, locality unknown, p. 28, Moore, *t. c.*
- Tajuria releta*, Distant, *t. c.* p. 246, pl. xxi. fig. 12, Malay Peninsula.
- Hypolycena renidens*, Mabilie, C.R. ent. Belg. xxviii. p. clxxxvi., Madagascar; *H. tora*, Kheil, *t. c.* p. 31, pl. v. fig. 40, Nias.
- Pratapa bhotea*, Moore, *t. c.* p. 37, Sikkim.
- Narathura roona*, *id. t. c.* p. 42, Andamans.
- Nilasera (?) asoka*, figs. 6 & 6a, p. 78, *N. (?) adriana* [ariadna on plate], 1884. [VOL. XXI.]

figs. 5 & 5a, p. 79, and *N. (?) malleri*, figs. 4 & 4a, p. 80, De Nicéville, *t. c.* pl. ix., Sikkim, &c.

Panchala trogon and *morphina*, Distant, *Ann. N. H.* (5) xiv. p. 201, Perak; *P. (?) paramuta*, De Nicéville, *t. c.* p. 81, pl. ix. figs. 7 & 7a, Sikkim.

Amblypodia andersonii, Moore, *t. c.* p. 43, Sampu, Mergui.

Deudorix calderon, Kheil, *t. c.* p. 33, pl. iv. fig. 25, Nias; *D. democles* [sic], Miskin, *t. c.* p. 95, N. Queensland.

Loxura cassiopeia, Distant, *t. c.* p. 200, Perak.

HESPERIIDÆ.

PLÖTZ, C. Die Hesperiiinen-Gattung *Ismene*, Swains., und ihre Arten. *S. E. Z.* xlv. pp. 51-66.

52 species (11 new) noticed. The following synonymy is given:—*I. vasutana*, Moore (= *septentrionis*, Feld.), *itelka*, Hew. (= *etelka*, Kirb.), *alexis*, Fabr. (= *taminatus*, Hübn.), *valmarum*, Wallengr. (= *florestan*, var. Trim.), *benjaminii*, Guer. (= *xanthopogon*, Koll., and *japonica*, Murr.), *exclamationis*, Fabr. (= *ladon*, Cram., *ferulus*, Hübn., and *thymbron*, Feld.), *keithloa*, Wallengr. (= *stella*, Trim.), *forestan*, Cram. (= *florestan*, Latr.), *arbogastes*, Guén. (= *florestan*, Boisd., and *margarita*, Butl.), *pansa*, Hew. (= *ernesti*, Grandid.), *anchises*, Gerst. (= *tarantis*, Hew.), *chalybe*, Westw. (= *bixa*, Donovan.), and *iphis*, Dru. (= *phidias*, Cram., and *jupiter*, Fabr.).

— Die Hesperiiinen-Gattung *Plastingia*, Butl., und ihre Arten. *T. c.* pp. 145-150.

19 species (4 new) enumerated, besides 2 unknown to the author. *I. gentius*, Swains., = *jeconia*, Butl.

— Die Hesperiiinen-Gattung *Apaustus*, Hübn., und ihre Arten. *T. c.* pp. 151-166.

65 species (31 new) enumerated, in addition to 6 unknown to the author. The following synonymy is given:—*P. phocion*, Fabr. (= *nothus*, Fabr., and *phocæus*, Westw.), *corades*, Feld. (= *decrepida*, Herr.-Schäff.), *maro*, Fabr. (= *flavovittata*, Latr.), and *numitor*, Fabr. (= *bion*, Fabr., *puer*, Hübn., and *marginatus*, Harr.).

— Die Hesperiiinen-Gattung *Thymelicus*, Hübn., und ihre Arten. *T. c.* pp. 284-290.

21 species enumerated (8 new), besides 7 unknown to the author. The following synonymy occurs:—*T. waco*, Hew. (= *aurantiaca*, Hew., and *minima* and *procris*, Edw.), *lineola*, Ochs. (= *virgula*, Hübn.), *thauamas*, Hufn. (= *comma*, Scop., *sylvestris*, Poda, *linea*, W. V., *flavus*, Müll., *divaricatus*, Fourcr., and *venula*, Hübn.), *vitellius*, Abb. & Smith (= *bucephalus*, Steph., and *iowa*, Scudd.).

— Die Hesperiiinen Gattung *Butleria*, Kirb., und ihre Arten. *T. c.* pp. 290-295.

16 species enumerated (6 new), in addition to 5 unknown to the author. *B. ibhara*, Butl., and *plancus*, Hopff., = *crithote*, Hew.

[PLÖTZ, C.] Die Hesperinen Gattung *Telesto*, Boisd., und ihre Arten. *T. c.* pp. 376-384.

26 species enumerated (8 new), in addition to 9 unknown to the author. The following synonymy occurs:—*T. donnyssa*, Hew. (= *eliena*, Herr.-Schäff.), *iachthus*, Fabr. (= *eliena*, Hew.), *gremius*, Fabr. (= *divodasa*, Moore), *peronii*, Latr. (= *kochii*, Feld., and *doclea*, Hew.), *double-dayi*, Feld. (= *leachii*, Feld., and *dirphia*, Herr.-Schäff.).

— Die Hesperinen-Gattung *Isoteinon*, Feld., und ihre Arten. *T. c.* pp. 385 & 386.

5 species enumerated. *I. vitrea*, Murr., = *lamprospilus*, Feld.

— Die Hesperinen-Gattung *Carterocephalus*, Led., und ihre Arten. *T. c.* pp. 386-388.

6 species noticed (1 new), in addition to 3 unknown to the author.

— Die Gattung *Abantis*, Hopff. *T. c.* pp. 388 & 389.

1 species only, *A. tettensis*, Hopff.

— Die Gattung *Cyclopides*, Hübn., und ihre Arten. *T. c.* pp. 389-397.

27 species noticed (5 new), in addition to 13 unknown to the author.

— Die Hesperinen-Gruppe, der Achlyoden. JB. nass. Ver. xxxvii. pp. 1-55.

The following genera of Hübner's are discussed in this paper:—*Ephyriades* (15), *Pythonides* (34), *Achlyodes* (33), *Antigonus* (64), *Nisoniades* (19), *Tagiades* (64). Many new genera are described, and the following synonymy is given:—*Ephyriades polycctor*, Prittw. (= *Helias ithrana*, Butl.), *dan*, Fabr. (= *fatih*, Koll.). *Pythonides cerialis*, Cram. (= *orcus*, Fabr., and *cerberus*, Hübn.), *festiva*, Er. (= *lucullea*, Hew.), *lerina*, Hew. (= *zeus*, Herr.-Schäff.), *tertullianus*, Fabr. (= *amaryllis*, Staud.), *lancea*, Hew. (= *jovianus*, Hübn.), *fabricii*, Kirb. (= *jovianus*, Fabr.), *jovianus*, Cram. (= *pseudojovianus*, Westw., and *pluvius*, Herr.-Schäff.), *clito*, Fabr. (= *hemes*, Latr.), *Achlyodes busirus*, Cram. (= *sebalus*, Fabr., and *busiris* and *bucolus*, Hübn.), *pallida*, Feld. (= *ozotes*, Butl., and *mithridates*, Fabr.), *thraso*, Hübn. (= *tamenund*, Edw.), *ulpianus*, Poey (= *austera*, Prittw., and *rosina*, Butl.), *begga*, Prittw. (= *pyralina*, Möschl.), *truncata*, Hew. (= *ophia*, Butl.), and *brebissonii*, Latr. (= *phagesia*, Hew.), *Antigonus nearchus*, Latr. (= *ustus*, Hübn., and *hippalus*, Feld.), *pausus*, Westw. (= *sataspes*, Feld.), *erosus*, Hübn. (= *westermanni*, Latr., *arcas*, Dru. (= *philemon*, Fabr., *flyas*, Cram., and *velasquez*, Luc.), *obscurus*, Hübn. (= *corbulo*, Latr.), *sabadius*, Gray (= *nottoana*, Wallengr., *andrachne*, Boisd., and *agathnata*, Sazim.), *juvenalis*, Fabr. (= *terentius*, *funeralis*, *ovidius*, *ennius*, *propertius*, *tibullus*, *horatius*, *virgilius*, and *plautus*, Scudd. & Burg.), *costalis*, Westw. (= *juvenalis*, Edw.), *persius*, Scudd. (= *juvenalis*, Harr.), *zarucco*, Luc. (= *martialis*, Scudd.), *Nisoniades tages*, Linn. (= *morio*, Scop., *geryon*, Rott., *cervantes*, Grasl., and *unicolor*, Friv.), *hayhursti*, Edw. (= *perforata*, Möschl.), *Tagiades djalale*, Wallengr. (= *umbra*, Trim., and *bovieri*, Mab.), *angulata*, Feld. (= *swa*, Moore),

geometrina, Feld. (= *hadina* and *odina*, Butl.), *flesus*, Fabr. (= *ophion*, Dru.), *insularis*, Mab. (= *ophion*, Boisd.), *iapetus*, Cram. (= *nepos*, Fabr.), *trichoneura*, Feld. (= *pralaya*, Moore), *marlyoi*, Boisd. (= *sericea*, Freyer, and *rustan*, Koll.), *pulomaya*, Moore (= *maculosa*, Feld.), *leucocera*, Koll. (= *putra*, Moore), *molkeezi*, Wallengr. (= *amaponda*, Trim.), *celebica*, Feld. (= *permena*, Hew.), *gopala*, Moore (= *nymphalis*, Spey.), and *folus*, Cram. (= *cicero*, Fabr.).

[PLOTZ, C.] Analytische Tabellen der Hesperinen-Gattungen *Pyrgus* und *Carcharodus*. MT. Vorpomm. xv. pp. 1-24.

62 species of *Pyrgus* and 5 of *Carcharodus* mentioned. The following is the most important synonymy given:—*P. tessellum*, Hübn. (= *morio*, Scop., p., *hibisci*, Böb., and *nomas*, Led.), *diomus*, Hopff. (= *ferox*, Wallengr.), *vindex*, Cram. (= *superna*, Moore), *cynarus*, Ramb. (= *carthami*, Hübn., figs. 731 & 732), *carthami*, Hübn. (figs. 720-723, = *fritillum*, Fabr., p., and *valesiaca*, Mab.), *alveus*, Hübn. (= *malva*, Linn., p., *carthami*, Hübn., Verz., and *fritillum*, Fabr., p.), *serratula*, Ramb. (= *carlinæ*, Ramb., and *cæcus*, Nick.), *andromedæ*, Wallengr. (= *centaureæ*, Zell.), *centaureæ*, Ramb. (= *wyandot*, Edw.), *malva*, Linn. (= *morio*, Scop., p., *sao*, Scriba, and *althææ*, Esp.), *syrichtus*, Fabr. (= *montivagus*, Reak.), *communis*, Grote. (= *oileus*, Westw. & Humpbr., and *tessellatus*, Edw.), *tartarus*, Hübn. (*oilus*, Hübn., and ? *oileus*, Linn.); *Carcharodus alcea*, Esp. (= *morio*, Shaw), *althææ*, Esp. (= *malvarum*, Ochs., var. *marrubii*, Ramb., and *dravira*, Moore).

Saalmüller, Lep. Mad. i. pl. i., redescibes and figures *Hesperia boseæ*, Saalm., figs. 15 & 16, p. 105, *Antigonus andrachne*, Boisd. (= *hyalinata*, Saalm.), fig. 14, p. 112, and *Ismene pansa*, Hew. (= *ernesti*, Grand.), figs. 12 & 13, p. 114. The following synonymy occurs (pp. 112-114):—*Antigonus sabadius*, Boisd. (= *Pterygospidea nettoana*, Wallengr.), *Ismene arbogastes*, Guén. (= *margarita*, Butl.).

De Nicéville, J. A. S. B. lii. pl. x., redescibes and figures *Choaspes gomata*, Moore, fig. 7, p. 83, *harisa*, Moore, fig. 8, *Matapa aria*, *shalgrama*, Moore, p. 84, *sasivarna*, *druna*, Moore, *Baoris oceia*, Hew., fig. 11, p. 85, *Plesioneura ambarcesa*, Moore, fig. 9, p. 87, *badia*, Moore, fig. 10, *Pyrgus dravira*, Moore, fig. 5, p. 88, and *Satarupa bhagava*, Moore (?), fig. 14, p. 90. He also, t. c. pp. 99 & 100, notices *Padraona* (?) *purreea*, Moore (sexes), *Halpe sikkima*, Moore, *Isoteinon satwa*, De Nic., and *Tagiades atticus*, Fabr.

Aaron, Papilio, notices *Erycides okeechobee*, Worthington (= *batabano*, Luc.), iii. p. 22, *Pamphila panoquin*, Scudd. (from New Jersey), p. 22, *Eudamus tityrus*, Fabr., and its varr. *tmolis*, Burm., and *zestos*, Hübn. (transformations, &c.), pp. 26-30, *Pamphila manataaqua*, Scudd. (? = *cernes*, Boisd. & Lec.), p. 62, and *baracoa*, Lec. (from Florida), p. 150, iv.

Nisoniades juvenalis, Scudd. & Burg., and *Systasea zampa*, Edw. Localities noticed; Lintner, Papilio, iv. p. 144.

Thymeles santiago, Lef. (?), *Telegonus anaphus*, Cram., *Pamphila ocála*, Edw., and *phylæus*, Dru. (= *hala*, Butl.), noticed from Dominica; Godman & Salvin, P. Z. S. 1884, pp. 318-320.

Pamphila mathias and *Pyrgus galba*, Fabr. : transformations noticed ; Forsayeth, Tr. E. Soc. 1884. pp. 387 & 388. *P. phineus*, Cram., is from Amboina, not Surinam ; Butler, Ann. N. H. (5) xiii. p. 198.

Spilothyrsus altheæ, Hübn., var. *bæticus*, Ramb. (= *marrubii*, Herr.-Schäff.), noticed from the Valais ; Christ, MT. schw. ent. Ges. vii. p. 28.

Pyrgus diomus, Hopff., differentiated from *vindecæ*, Cram. ; Möschler, Verh. z.-b. Wien, xxxiii. pp. 286 & 287.

Syrichthus staudingeri, Spey., noticed and figured ; Christoph, in Romanoff's Mém. Lép. i. p. 106, pl. vi. fig. 7. *S. alveus*, Hübn. : *S. serratulæ*, Ramb., is not distinct ; the various forms may be classified in two groups as follows : (A) varr. *onopordi* and *cirsii*, Ramb., *fritillum*, Ochs., *alveus*, Hübn., *carlinæ*, Ramb. ; (B) varr. *serratulæ*, Ramb., and *cæcus*, Freyer ; Christ, t. c. p. 28.

Plesioneura chimæra, Plötz, noticed and figured ; Pagenstecher, JB. nass. Ver. xxxvii. p. 208, pl. vi. fig. 1.

Cyclopides leucopyga, Mab., = *Goniloba cretacea*, Snell. ; Snellen, Tijdschr. Ent. xxvii. p. 248.

Thanaos tages, Linn. : sleeping posture ; Frohawk & Trimen, Ent. xvii. p. 49, fig., & pp. 269 & 270.

New genera and species :—

Plotzia, Saalmüller, Lep. Mad. i. p. 115. Placed after *Ismene* ; affinities not stated. Type, *I. amygdalis*, Mab. (redescribed, *ibid.*).

Cupitha, Moore, J. A. S. B. liii. p. 47. Affinities not stated. To include *Pamphila purreea*, Moore, and *C. tympanifera* (type), sp. n., t. c. p. 48, Pegu.

Lobocla, *id.* t. c. p. 51. Affinities not stated. To include *Plesioneura liliana*, Atk. (type), and *L. casyapa*, sp. n., t. c. p. 52, Masuri, Kashmir.

Eudamus drusus, W. H. Edwards, Canad. Ent. xv. p. 211, S. Arizona.

Ismene consobrina (Herr.-Schäff., MS. ; = *adipodca*, Swains.), Java, p. 55, *philetas*, Philippines, *chabrona*, Malacca, *contempta* (Herr.-Schäff., MS.), Cape York, p. 56, *gnaeus*, p. 58, *certhia* (Herr.-Schaff., MS.), Philippines, *lizetta*, Java, p. 59, *andonginis* (Homeyer, MS.), Pungo Andongo, p. 60, *tancred*, Natal, p. 62, *necho*, Guinea, p. 63, and *æschylus* (Hopff., MS.), Senegal, p. 65, Plötz, S. E. Z. xlv.

Hesperia ahriman, Christoph, Romanoff's Mém. Lép. i. p. 106, pl. vi. figs. 5a & b, Nuchur ; *H. weymeri*, p. 107, *octofenestrata*, p. 108, *ellipsis*, Nossi-Bé, p. 109, and *epsilon*, Tamatave, Nossi-Bé, p. 110, Saalmüller, Lep. Mad. i. ; *H.* (?) *naga*, Upper Assam, and *H.* (?) *swerga*, Sikkim, De Nicéville, J. A. S. B. lii. p. 89, pl. x. figs. 2 & 12.

Proteides angasi, Godman & Salvin, P. Z. S. 1884. p. 318, pl. xxv. fig. 2, Dominica.

Pamphila rapola, *id.* t. c. p. 320, pl. xxv. figs. 3 & 4, Dominica ; *P. gemella*, Mabille, C.R. ent. Belg. xxviii. p. clxxxvii, Madagascar ; *P. moseleyi*, Butler, Ann. N. H. (5) xiii. p. 198, Ké Dulan ; *P. larika* (Plötz, MS.), Pagenstecher, JB. nass. Ver. xxxvii. p. 207, pl. vii. fig. 1, Amboina ; *P. lasus*, p. 54, *lunus* (= *deva*, p., Edw., which is here redescribed), p. 56, *bellus* and *cestus*, p. 57, W. H. Edwards, Papilio, iv., Arizona.

Apantus triplex, locality unknown, p. 152, *durga*, Philippines, p. 153,

neander, Loango, p. 154, *odilia*, *argynnis*, Brazil, p. 155, *argyrospila*, Aburi, *zephora*, Angola, *olaus*, Loango, p. 156, *mergus*, Philippines, *acroleuca*, Brazil, p. 157, *facilis*, Surinam, *scheria*, Parà, *interpunctata* (Hopff., MS.), Bahia, *filata* (Poey, MS.), Cuba, p. 158, *polita* (Weym., MS.), locality unknown, p. 159, *fabulinus*, Surinam, *venosus* (Pritt., MS.), S. America, *bebarus*, Colombia, p. 160, *tenera* (Hopff., MS.), Laguayra, p. 161, *clavicula*, Rio, *levina*, Brazil, p. 162, *vicinus* (Herr.-Schäff., MS.), locality unknown, *eudesmia*, Mexico, *krexos*, Parà, *ferrago* (Hopff., MS.), locality unknown, *flavocostata*, Rio, p. 163, *imerius*, Brazil, p. 164, *alix* (Herr.-Schäff., MS.), *dolon* (Herr.-Schäff., MS.), Australia, *prittwitzii*, p. 165, *euphrasia* and *leporina* (Herr.-Schäff., MS.), Mexico, p. 166, Plötz, *t. c.*

Thymelicus macra (Edw., MS.), N. America, p. 284, *heydeni* (Herr.-Schäff., MS.), locality unknown, p. 285, *tucumanus*, Cordova, *isidorus*, Mexico, p. 287, *fabriolata* (Keferst., MS.), *myconius* (Weym., MS.), Java, *ziclea*, Philippines, p. 289, and *brevicornis*, Angola, p. 290, Plötz, *t. c.*

Carcharodus radiatus (Herr.-Schäff., MS.), *id.* MT. Vorpomm. xv. p. 23, Texas.

Pyrgus aconita (Herr.-Schäff., MS.), Georgia, *willi*, Minas Geraes, *adepta* (Herr.-Schäff., MS.), Bogota, p. 3, *albescens*, *insolatrix* (Herr.-Schäff., MS.), Mexico, p. 4, *dromus*, *zaira*, Congo, p. 6, *nora*, Loango, p. 7, *veturius*, locality unknown, p. 13, *adjutrix* (Herr.-Schäff., MS.), *bellatrix*, Buenos Aires, p. 15, *dion*, locality unknown, p. 16, *lycurgus*, Central America, p. 18, *varus*, Mexico, *xanthus* (Weym., MS.), Colorado, p. 20, *abscondita* (Herr.-Schäff., MS.), Africa, p. 21, and *argina* (Herr.-Schäff., MS.), Brisbane, p. 22, *id. t. c.*

Astictopterus butleri, Wood-Mason & De Nicéville, J. A. S. B. lii. p. 98, pl. x. fig. 3, Sikkim, &c.

Plastingia thora, Guinea, p. 145, *drancus*, locality unknown, p. 149, *alexina*, Ship Island, and *podora*, Senegal, p. 150, Plötz, S. E. Z. xlv.

Plesioneura agni, De Nicéville, *t. c.* p. 87, pl. x. fig. 4, Sikkim; *P. munda*, Moore, J. A. S. B. liii. p. 48, Simla; *P. humbloti*, Mabilie, *t. c.* p. clxxxvii., Madagascar.

Trapezites fastuosus, *id. t. c.* p. clxxxvi., Madagascar.

Telesto zaremba, Old Calabar, p. 377, *praxedes*, Port Jackson, p. 378, *phlea*, Melbourne, p. 378, *dominula* (Herr.-Schäff., MS.), Tasmania, *parvulus* (Herr.-Schäff., MS.), Australia, p. 379, *cacilius* (Herr.-Schäff., MS.), India, p. 380, *extranea* (Herr.-Schäff., MS.), p. 383, and *arsenia*, Australia, p. 384, Plötz, *t. c.*

Carterocephalus flavimargo (Phil., MS.), *id. t. c.* p. 387, Chili.

Cyclopides paola, Angola, p. 392, *brunneostriga*, Pungo Adongo, *gyran*, Mexico, p. 393, *facetus*, locality unknown, and *vitus*, Chili, p. 394, *id. t. c.*

Butleria mesoxantha (Moritz, MS.), *xantholeuca* (Herr.-Schäff., MS.), Venezuela, p. 291, *dolabella*, Chiriqui, *ligilla* (Herr.-Schäff., MS.), p. 292, *apertus*, locality unknown, p. 293, *pruna*, St. Domingo, p. 294, *id. t. c.*

Choaspes (?) *anadi*, De Nicéville, *t. c.* p. 83, pl. x. fig. 6, Sikkim, Masuri.

Matapa shalgrama, De Nicéville ($\approx$ *Hesperia aria*, ♀, Hew.), *t. c.* p. 85, Sikkim.

Parnara tulsii, De Nicéville, *t. c.* p. 86, pl. x. fig. 1, Sikkim.

Isoeteon satwa, *id. ibid.* fig. 15, Darjiling.

Abaratha taglorii, *id. t. c.* p. 88, pl. x. fig. 13, Orissa.

Ephyriades variegata (Prittw., MS.), Rio, p. 2, *dichroa* (Herr.-Schäff., MS.), Java, p. 5, and *lælius*, Gaboon, p. 6, Plötz, JB. nass. Ver. xxxvii.

Pythonides praxis (Maass., MS.), Cayenne, p. 7, *portulana*, Maass., MS.), S. America, *cæruleus* (Herr.-Schäff., MS.), Brazil, p. 8, *alaricus*, Bahia, p. 10, *servatus*, Parà, p. 11, *subalbata* (Herr.-Schäff., MS.), New Granada, p. 12, and *prudens*, Surinam, p. 13, *id. t. c.*

Nisoniades bautista, California, p. 36, *tucumanus*, Cordova, *flavipalpis*, Copiapa, p. 37, *eusebius*, Central America, *astur* (Herr.-Schäff., MS.), S. America, p. 38, *aterea* (Herr.-Schäff., MS.), Rio, *æta*, Brazil, Chiriqui, and *norica*, Brazil, Cayenne, p. 39, *id. t. c.*

Achlyodes nixonicus (Kef., MS.), Mexico, *thiena*, locality unknown, *serapion*, New Freiburg, *plumbago* (Herr.-Schäff., MS.), locality unknown, *fatinitza*, Colombia, *protius* (Herr.-Schäff., MS.), Brazil, p. 14, *gorgona*, Guatemala, *noctula* (Hopff., MS.), Parà, *basigutta* (Herr.-Schäff., MS.), S. America, *corbrianus* (Herr.-Schäff., MS.), Rio, p. 15, *anticus* (Herr.-Schäff., MS.), Mexico, p. 16, *ancholis*, Colombia, *blanda* (Herr.-Schäff., MS.), locality unknown, *servius* (Herr.-Schäff., MS.), Brazil, *erisichthon* (Herr.-Schäff., MS.), and *enidus*, locality unknown, p. 19, *id. t. c.*

Tagiades khasiana, Moore, *t. c.* p. 51, Khasia Hills, Assam.

Antigonus sericus, Chiriqui, p. 22, *bipuncta* (Herr.-Schäff., MS.), Mexico, *aura* (Herr.-Schäff., MS.), Brazil, *badia* (Herr.-Schäff., MS.), Chanchomayo, p. 23, *æclydes* (Weym., MS.), Colombia, *kethra*, Philippines, *forensis* (Weym., MS.), *tolimus*, Colombia, p. 24, *obliqua* (Maass., MS.), locality unknown, p. 25, *robigus*, S. America, *patens* (Prittw., MS.), Rio, *simplicior* (Herr.-Schäff., MS.), Brazil, *alburnea* (Herr.-Schäff., MS.), Parà, *fumosus*, Brazil, p. 26, *ruptifusciata*, S. America, *tortricinus* (Herr.-Schäff., MS.), Panama, Venezuela, *triseriata* (Herr.-Schäff., MS.), Venezuela, *eremita* (Herr.-Schäff., MS.), S. America, p. 27, *cajus*, Peru, p. 28, *adamus* (Herr.-Schäff., MS.), Brazil, p. 31, *jamaicensis*, Jamaica, *heteropterus* (Herr.-Schäff., MS.), Brazil, p. 32, and *diogenes* (Herr.-Schäff., MS.), Cuba, p. 34, Plötz, *t. c.*

Tagiades pexadora (Maass., MS.), locality unknown, *teniatius* (Herr.-Schäff., MS.), Oaxaca, p. 41, *danae* (= *syrichthus*, Feld.), Java, *bibiana* (Herr.-Schäff., MS.), Colombia, p. 43, *doria*, Mexico, *cæcus*, locality unknown, *monophthalma*, Brazil, p. 44, *diophthalma*, locality unknown, *jacobus*, Rio, p. 45, *morvus*, Brazil, *titus*, p. 46, *martinus*, Philippines, p. 47, *vulturina*, *athos* (Weym., MS.), Calcutta, p. 48, *monurtus*, Panama, p. 49, *hiera*, locality unknown, p. 51, *limax* (Herr.-Schäff., MS.), locality unknown, p. 54, and *cosima*, N. India, p. 55, *id. t. c.*

Suastus aditus, Andamans, and *moellerii*, Sikkim, Moore, *t. c.* p. 49.

Satasupa phisara, Khasia Hills, and *naradu*, Darjiling, Sikkim, *id. t. c.* p. 50.

SPHINGIDÆ.

Saalmüller, Lep. Mad. i., figures and redescribes *Hemaris hylas*, Linn., pl. iii. fig. 40, p. 117, *Diodosida peckoveri*, Butl., pl. iv. fig. 41, p. 121,

Daphnis nerii, Linn., var. *infernelutea*, p. 123, *Ambulyx coquerelii*, Boisd., pl. iii. fig. 39, p. 124, *Protoparce solani*, Boisd., var. *griseus*, pl. iii. fig. 37, p. 129, *Nephele charoba*, Kirb., *hespera*, Fabr. (= *morpheus* and *chiron*, Cram., and *Perigonia obliterans*, Walk.), fig. 42, p. 133, *densoi*, Kef. (= *Zonilia malgassica*, Feld., and *rhadama*, Boisd.), figs. 43 & 43a, pl. iv. p. 135. The following additional synonymy is noted, t. c. pp. 120 & 121:—*Basiothia idrieus*, Dru. (= *Chærocampa transfigurata*, Wallengr.), *Diodosida tyrrhus*, Boisd. (= *murina*, Walk., and *Chærocampa argyropeza*, Mab.).

Captures of *Sphingidæ* at Orono, Maine; [Mrs.] C. H. Fernald, Canad. Ent. xvi. pp. 21 & 22.

Chærocampa celerio and *thyelia*, Linn., *oldenlandiæ*, Fabr., *Daphnis nerii*, Linn., *Protoparce orientalis*, Butl., *Acherontia styx*, Westw., *Clanis cervina*, pl. xv. figs. 1, 1a, b, & 2, *C. deucalion*, Walk. (?), and *Polyptychus dentatus*, Cram. Transformations described; Forsayeth, Tr. E. Soc. 1884, pp. 388–395.

Hemaris uniformis, Grote & Rob., *Darapsa chærilus*, Cram., *Cressonia juglandis*, Abb. & Smith, and *Sphinx chersis*, Hübn. Larvæ described; H. Edwards & S. L. Elliot, Papilio, iii. pp. 125–127.

Notes on undescribed larvæ of *Sphingidæ*; Fischer, Canad. Ent. xv. p. 238.

Chærocampa andamanensis, *Acherontia sculda*, *Nephele charoba* and *infernalis*, Kirby, figured by Waterhouse, Aid. iii. pl. cxli. figs. 1–4.

Hemaris tenuis, Grote. Larva described; Fischer, op. cit. xvi. p. 143.

Macroglossa stellatarum, Linn. Hibernation; Fuchs, S. E. Z. xlv. p. 254. Feigning injury: Campbell, Tr. Hertf. Soc. iii. p. 129.

Calliomma licastus, Cram., noticed; Lucas, Bull. Soc. Ent. Fr. (6) iii. pp. cxliii. & cxliv.

Darapsa versicolor, Harr. Larva probably amphibious; Fletcher, Rep. E. Soc. Ont. 1883, p. 16. Food-plant noticed; id. Canad. Ent. xv. p. 204.

Deilephila celario and *nerii*, Linn., noticed; Ragusa, Nat. Sicil. iv. pp. 31 & 32. Observations on larva of the latter; Glaser, Ent. Nachr. x. pp. 326 & 327. *D. porcellus*, Linn., var. *snellus*, Staud., noticed and figured; Romanoff, Mém. Léop. i. p. 71, pl. iv. fig. 1.

Pachylia ficus, Cram. Larva destructive to *Eucalyptus*; Schaus, Papilio, iv. p. 21.

Smerinthus cablei, Von Reizenstein, redescribed; Pearce, Encycl. Am. i. p. 687. *S. excæcatus*, figs. 1 & 2 (larva); and *myops*, fig. 3, Abb. & Smith, popularly described and figured; W. Saunders, Canad. Ent. xvi. pp. 9–11. Notes on food-plants of the former; Fischer, op. cit. xvi. p. 17, and Fletcher, Rep. E. Soc. Ont. 1883, p. 16. *S. populi*, Linn., double or triple brooded; Hall & Carrington, Ent. xvii. p. 209. *S. tilia*, Linn.: transformations described; Savard, Bull. Insect. Agric. ix. pp. 172–174.

Acherontia atropos, Linn. Notes on life-history; Von Post, Ent. Tidskr. v. pp. 193, 194, & 228. Tufts of ♂ described; Haase, Z. E. Ver. schles. (2) ix. pp. 15 & 16, fig. 1. Occurrence in East Prussia; Gauckler, Ent. Nachr. x. pp. 162 & 163.

Amphonyx cluentius, Cram., redescribed; H. Edwards, Papilio, iv. pp. 11 & 12.

Diludia collaris, Walk., is distinct from *brontes*, Dru.; H. Edwards, t. c. p. 12.

Protoparce cingulata, Fabr., recorded from Ternate; Butler, Ann. N. H. (5) xiii. p. 199.

Sphinx sp. figured; Fyles, Rep. E. Soc. Ont. 1883, p. 66, fig. 37.

Dolba hylæus, Dru. Supposed larva noticed; Harrington, Canad. Ent. xvi. pp. 54 & 55.

Maassenia, g. n., Saalmüller, Lep. Mad. i. p. 126. Allied to *Nephele*. Type, *N. heydeni*, Saalm. (redescribed and figured, *ibid.* pl. iii. fig. 38).

New species:—

Macroglossa cinerescens, Butler, Mem. Nat. Ac. Sci., Rep. Eclipse Exped. p. 94, Caroline Island.

Cephonodes bucklandii (= *cunninghami*, Boisd., nec Walk.), *id.* Ann. N. H. (5) xiv. p. 404, Port Darwin.

Panacra butleri, Saalmüller, Lep. Mad. i. p. 118, pl. v. fig. 51, Nossi-Bé.

Ambulyx watersii, Butler, t. c. p. 407, Betsileo, Madagascar.

Smerinthus davidi, Oberthür, Bull. Soc. Ent. Fr. (6) iv. p. xii., and *Études d'Ent.* ix. p. 29, Asia Minor.

Sphinx agrapha, Mabilie, C.R. ent. Belg. xxviii. p. clxxxvii., Madagascar; *S. insolita*, Lintner, Papilio, iv. p. 145, Texas.

ÆGERIIDÆ.

Sciapteron fervidum, Led., pl. v. fig. 2, and *Sesia empiformis*, Esp., var. *schizoceriformis*, Kol., pl. iv. figs. 2 & 3, noticed and figured, and the former redescribed; Romanoff, Mém. Lép. i. pp. 73 & 76.

Sincara phyllis, *lytæa*, Guatemala, and *cambyses*, Panama, *Sannina verrugo*, Mexico, and *korites*, Guatemala. Druce, Biol. Centr. Am. Lep. *Het.* pp. 33 & 34, fully describes these species [*cf.* Zool. Rec. xx. *Ins.* p. 186].

Sesia apiformis, Linn. Habits and transformations; Savard, Bull. Insect. Agric. ix. pp. 109–113, fig. 9.

Pyrrotaenia geliformis, Walk., redescribed; H. Edwards, Papilio, iii. p. 157.

Ægeria acerni, Clem., popularly described and figured, with notice of ravages in Canada; W. Saunders, Rep. Fruit-Grower's Ass. Ont. 1882, pp. 271 & 272, fig. 7, and Rep. E. Soc. Ont. 1883, p. 12. *Æ. tipuliformis*, Linn., and its parasite, *Phaogenes ater*, Cress., noticed; Cook, Pract. Ent. pp. 17 & 18. Occurrence in New Zealand; N. Z. J. Sci. ii. pp. 229 & 230.

New species:—

Sesia dioctriiformis, Romanoff, Mém. Lép. i. p. 74, pl. v. fig. 3, Mastara.

Ægeria bolteri, Illinois, and *amula*, locality not stated, H. Edwards, Papilio, iii. p. 155.

Sciapteron præcedens, *id. ibid.*, N. Carolina.

Pyrrotaenia wittfeldii, Florida, *subærea* and *animosa*, Arizona, p. 156, *id. t. c.*

Melittia bergii, *id. t. c.* p. 157, Buenos Aires.

THYRIDIDÆ.

Thyris nevadæ, sp. n., Oberthür, Études d'Ent. viii. p. 33, note, Sierra Nevada.

Platythyris granulata, sp. n., Neumoegen, Papilio, iii. p. 137, Arizona.

CASTNIIDÆ.

Castnia eudesmia, Gray. Note on transformations; Crowley, P. E. Soc. 1884, p. i.

COCYTIIDÆ.

Family characterized, and species discussed and tabulated; Butler, Tr. E. Soc. 1884, pp. 351-353.

Cocytia veitchii, *id. t. c.* p. 352, Batchian; *C. ribbei*, Druce, Ent. M. M. xxi. p. 156, Aru: spp. nn.

AGARISTIDÆ.

Druce, Biol. Centr. Am. *Lep. Het.* i. pp. 34-36, notices *Pseudalypia crescens*, Walk. (= *grotei*, Boisd.), *bimaculata*, Herr.-Schäff. (= *trimaculata*, Boisd.), *Alypia octomaculata*, Fabr. (= *quadriguttalus*, Hübn., and *disparata*, Edw.), and *Phasis tribuna*, Hübn. (= *Josia* (?) *continua*, Walk.).

Alypia octomaculata, Fabr.: abundance at Boston; Lyman, Rep. E. Soc. Ont. 1883, pp. 28 & 29. *A. (Agarista) grotei*, Boisd., noticed; H. Edwards, Papilio, iv. p. 13.

Pseudalypia crotchii, H. Edw., var. *atrata* from California described; *id. t. c.* p. 121.

Euscirrhopterus laminifer, Saalmüller, redescribed by him; Lep. Mad. i. p. 140 [figured, pl. vii. (?) fig. 133, ined.].

Ophthalmis lincea, Cram. Note on locality; Butler, Ann. N. H. (5) xiii. p. 199.

Bursada perdica, Cram. (var. = *truncata*, Walk.), and *Craspedosia ernstina*, Cram. (= *Celerena sobria*, Walk.), noticed; *id. t. c.* p. 201.

Alypia disparata, Mexico, and *hudsonica*, Hudson's Bay, spp. nn., H. Edwards, Papilio, iv. pp. 13 & 43.

Agarista epipales, Mabille, C.R. ent. Belg. xxviii. p. clxxxix., Madagascar; *A. bifornis*, p. 404, *ardescens*, Port Darwin, *vindex*, Queensland, p. 405, and *darwiniensis*, Port Darwin, p. 406, Butler, Ann. N. H. (5) xiv.: spp. un.

Eusemia watersii, sp. n., *id. t. c.* p. 409, Betsileo, Madagascar.

Ophthalmis decipiens, sp. n., *id. t. c.* p. 34, Nias.

CHALCOSIIDÆ.

|| *Sephisa*, Moore, renamed by him *Devanica*; Tr. E. Soc. 1884, p. 355. *Devanica bicolor*, sp. n., *id. ibid.*, Cachar.

Epyrgis desgodinsi, sp. n., Oberthür, Études d'Ent. ix. p. 18, pl. ii. fig. 10, Thibet.

Chalcosia daviidi, sp. n., *id.* t. c. p. 19, pl. i. fig. 2, Thibet.

Laurion zebra, sp. n., Butler, Ann. N. H. (5) xiv. p. 85, Nias.

THYMARIDÆ.

Rogenhofer proposes the name *Himantopteridæ* for this family, which he considers nearest allied to the *Syntomidæ* and *Procridæ*. He includes in it *Thymara*, Doubl., *Himantopterus*, Wesm., and a new genus. SB. z.-b. Wien, xxxiii. p. 24.

Dorapteryx, g. n., *id.* t. c. p. 23. Type, *D. afra*, sp. n., t. c. p. 24, figs. 1 & 2, E. Africa.

ZYGÆNIDÆ.

Druce, Biol. Centr. Am. *Lep. Het.* pp. 41-68, notes the synonymy, &c., of the following species:—*Pyromorpha dimidiata*, Herr.-Schäff. (= *Malthaca perlucidula*, Clem.), *Syntomedia* [sic] *melanthus*, Cram. (= *Sphinx nyctus*, Cram.), *sauleyi*, Guér. (= *Calonota* (?) *niveifascia*, Walk.), *Amycles flavifascia*, Herr.-Schäff. (= *Pampa aliena*, Walk.), *Isauthrene incendiaria*, Hübn. (= *flavicornis*, Walk., nec Fabr.), *Homococera scintillans*, Herr.-Schäff. (= *flavitarsis*, Walk.), *Myrmecopsis semihyalina*, Walk. (= *Pseudosphex vespiformis*, Herr.-Schäff.), *M. polistes*, Hübn. (= *eumenides*, Newm.), *Pseudomyia tipulina*, Hübn. (= *bibia*, Walk.), *Mochloptera xanthocera*, Walk., *Cosmosoma metallescens*, Ménétr. (= *chalcosticta*, Butl.), *confine*, Herr.-Schäff. (= *Glaucopis venusta*, Walk.), *auge*, Linn. (= *omphale*, Hübn.), *Ilipa stilbosticta*, Butl., *Dinia eagrus*, Cram. (= *Enomia mena* and *Glaucopis* (D.) *saucia*, Walk.), *Trichura druryi*, Hübn. (= *Sphinx coarctata*, Dru.), *Antichloris eriphia*, Fabr. (= *phemonoe*, Hübn.); and figures *Histiæa meldolæ*, Butl., pl. vi. fig. 14, *Macrocneme auripes*, Walk., pl. vi. fig. 15, *Mastigocera ædipus* and *calvipes*, Boisd., figs. 19 & 20, *Isanthrene crabroniformis*, Staud., fig. 23, *Sarosa pompilina*, Butl., fig. 24, *Sphecosoma fasciolatum*, Butl., and *testaceum*, Walk., figs. 26 & 27, pl. vi., *Pheia intensa*, Walk., fig. 16, *Cosmosoma hector*, Staud., fig. 17, *impar*, Walk., fig. 20, *Dycladia mexicana*, Walk., fig. 2 vittata, Walk., fig. 21, *felderi*, fig. 18, *esmeralda*, Walk., fig. 4, *Napata leucotelus*, Butl., fig. 24, and *Eriphia tractipennis*, Butl. fig. 27, pl. viii.

Romanoff, Mém. Lép. i. pp. 70-82, pl. iv., notices and figures *Zygana erebus*, Staud., fig. 4, *cambysea*, Led., var. n. *rosacea* from Transcaucasia (described, p. 79), *armena*, Eversm., ab. *flava*, fig. 5, *cuvieri*, Boisd., fig. 6, and *Syntomis caspica*, Staud., fig. 7.

Saalmüller, *Lep. Mad.* i. p. 147, notes the following synonyms:—*Pseudonacليا quadrimaculia*, Mab. (= *sylvicolens*, Butl.), *Euchromia lethe*, Fabr. (= *Sphinx eumolphus*, Cram., *Glaucopis folletii*, Guér., and *formosa*, Boisd.).

Dysauxes. Saalmüller, t. c. p. 142, divides the species of Madagascar into 2 characterized sections; the first including *Syntomis minuta*, *myodes*, Boisd., *reducta*, Mab., *Nacليا anapera*, *tenera*, and *trimaculia*, Mab.; and

the second including *Syntomis quinquemacula* and *butleri*, Mab., *Dysauxes amplificata*, Saalm. (redescribed and figured, t. c. p. 146, pl. vi. fig. 35), and some new species.

Zygæna. Oberthür, Études d'Ent. viii. pp. 27-33, specially notices the following Pyrenean species:—*Z. minos*, Hübn., *scabiosæ*, Esp., *sarpedon*, Hübn., and var. *vemetensis*, *contaminei*, Esp., *achilleæ*, Esp., var. *tristis*, *anthyllidis*, Boisd., pl. i. figs. 14-17 (3 varr. and transformations figured), *transalpina*, Esp., and allies, *fausta*, Linn., var. *juncea*, Mill., and *hilaris*, Ochs., var. *escorialensis*, Oberth. Notes on various species (especially *Z. trifolii*, Esp., var. *dubia*, Staud.), observed in Switzerland in 1883; Baker, Ent. M. M. xxi. pp. 9 & 10. *Z. scabiosæ*, Schev., varr. *triptolemus*, Freyer (? *romeo*, Dup.), and *freyeri*, Led. (? *orion*, Herr.-Schäff.), *Z. charon*, Hübn. (? southern form of *meliloti*, Esp.), *Z. loniceræ*, *trifolii*, Esp., *stachadis*, Borkh., and *dubia*, Staud., and *Z. filipendulæ*, Linn., var. *ochsenheimeri*, Zell., discussed; Freye, MT. schw. ent. Ges. vii. pp. 13-17. *Z. erythrus*, Hübn. (cum varr. *dystrepta* and *centaureæ*, Fisch.), *sedi*, Fabr., *lata*, Hübn., and *carniolica*, Scop., are the only species found at Sarepta, *Z. sedi* being abundant, but remarkably local; Grumm-Grshimaïlo, Romanoff's Mém. Léop. i. pp. 172 & 173. *Z. loniceræ*, Esp., and *filipendulæ*, Linn.: note on variation; Porritt, Ent. xvii. p. 18. *Z. brizæ*, Esp.: transformations described; Rogenhofer, Verh. z.-b. Wien, xxxiv. pp. 154 & 155. *Z. filipendulæ*, Linn., found in coitû with species of *Procris*; Oberthür, Études d'Ent. viii. p. 31. *Z. hippocrepidis*, Hübn.: aberrations noticed; Delahaye & Poujade, Bull. Soc. Ent. Fr. (6) iv. p. xevii. *Z. pilosellæ*, Esp., abb. *pluto*, Ochs., and *interrupta*, Staud., noticed; Fuchs, S. E. Z. xlv. pp. 256 & 257. *Z. rubicundus*, Hübn., discussed and redescribed; it is an unrecognized species: Standfuss, S. E. Z. xlv. pp. 207-209. *Z. transalpina*, Esp.: supposed variety from Tyrol noticed; Lehmann, Z. E. Ver. schles. (2) ix. p. xxv.

Ino geryon, Hübn., discussed; Fuchs, t. c. pp. 254-256.

Procris ampelophaga, Bayle. Hermaphrodite noticed and figured; Wachtl, Wien. ent. Z. iii. p. 289, pl. i. fig. 2.

Syntomis phegea, Linn. Variety of ♀ noticed; Wocke, Z. E. Ver. schles. (2) ix. p. 47.

New genera and species:—

Pseudoprocris, Druce, Biol. Centr. Am. Lep. Het. p. 38. Allied to *Procris* and *Triplocris*, but with very long, thick, simple antennæ. Types, *P. gracilis*, pl. vi. fig. 3, Mexico, and *dolosa*, Guatemala, spp. nn.

Pseudocharis, id. t. c. p. 56. Resembles *Laemocharis*, *Dycladia*, and *Macrocneme*. To include *P. nenia* (type), fig. 12, and *sithon*, fig. 7, spp. nn., t. c. p. 57, pl. vi., Guatemala.

Zygæna smirnovi, Christoph, in Romanoff's Mém. Léop. i. p. 108, pl. vi. fig. 6a & b, Mexico.

Procris thyana, fig. 7, *thyesa*, fig. 6, Guatemala, and *forreri*, Mexico, Druce, Biol. Centr. Am. Lep. Het. p. 37, pl. vi.

Seryda megalops, id. t. c. p. 38, pl. vi. fig. 5, Guatemala.

Urodus ruficollis, pl. vi. fig. 11, *modesta* and *imitata*, id. t. c. p. 39, Guatemala.

Harrisina guatemalena (*Aglaope guatemalena*, pl. vi. fig. 10), Guatemala, and *ruemelii*, Mexico, Druce, *t. c.* p. 40.

Triprocris martenii, French, Papilio, iii. p. 191, and *P. aversus*, H. Edwards, Papilio, iv. p. 13, Arizona.

Dysauxes contigua, pl. vi. fig. 93, p. 143, *distincta*, p. 144, *expallesces*, Nossi-Bé, and *extensa*, Tamatave, p. 145, Saalmüller, Lep. Mad. i.

Syntomis zygænoides and *muscella*, Mabille, C.R. ent. Belg. xxviii. p. clxxxviii., Madagascar.

Pyrrhomorpha fusca, H. Edwards, *t. c.* p. 43, Arizona; *P. cinniana*, (*Procris cinniana*, pl. vi. fig. 12), Druce, *t. c.* p. 41, Guatemala.

Rhodogastra fraterna, Moore, Tr. E. Soc. 1884, p. 356, Bombay.

Syntomedia [sic] *angasi*, Druce, P. Z. S. 1884, p. 321, pl. xxx. fig. 5, Dominica.

Amerila bauri, Möschler, Verh. z.-b. Wien, xxxiii. p. 289, pl. xvi. fig. 2, Caffraria.

Lycomorpha mexicana, pl. viii. fig. 1, Mexico, and *anacreon* (*Procris anacreon*, pl. vi. fig. 4), Costa Rica, Druce, Biol. Centr. Am. Lep. Het. p. 41; *L. contermia* and *marginata*, H. Edwards, *t. c.* p. 13, Mexico.

Eupyrre corydon, Druce, *t. c.* p. 44, pl. vi. fig. 13, Guatemala.

Calonotos trotschii and *metallicus*, *id. t. c.* pp. 44 & 45, pl. viii. figs. 8 & 2, Panama.

Amycles albonmarginata, fig. 26, Panama, p. 45, *flavicollis*, fig. 11, pl. vii., and *strigosa*, pl. viii. fig. 3, p. 46, Guatemala, *id. t. c.*

Ichoria lycone, *id. t. c.* p. 47, pl. vi. fig. 9, Costa Rica, Panama.

Macrocneme iole, fig. 17, Guatemala to Panama, *adonis*, fig. 16, pl. vi., Mexico to Panama, and *evelina*, pl. viii. fig. 4, Panama, p. 48, *id. t. c.*

Callicarus laconia, *id. t. c.* p. 49, pl. vi. fig. 18, Mexico, Yucatan.

Isanthrene echemon, pl. vi. fig. 22, Guatemala, and *championi*, pl. viii. fig. 6, Panama, *id. t. c.* p. 50.

Homæocera beatrix, *id. t. c.* p. 51, pl. vi. fig. 25, Panama.

Erruca azia (*Homæocera azia*, pl. vi. fig. 21), *id. t. c.* p. 53, Guatemala.

Myrmecopsis crabronis, *id. t. c.* p. 54, pl. viii. fig. 9, Guatemala, Panama.

Gymnelia gigantea, pl. viii. fig. 5, Costa Rica, and *xenodorus*, pl. vii. fig. 1, Guatemala, *id. t. c.* pp. 54 & 55.

Lamocharis stryia, Nicaragua, and *hercyna*, Panama, Nicaragua, *id. t. c.* p. 55, pl. vii. figs. 5 & 6.

Gymnopoda subflamma, *id. t. c.* p. 56, pl. viii. fig. 10, Panama.

Thrinacia sanguinea, pl. vii. fig. 9, Guatemala, and *intermedia*, Panama, *id. ibid.*

Cosmosoma elegans, fig. 13, Guatemala, Panama, *saron*, fig. 14, Panama, *advena*, fig. 15, and *myrrha*, fig. 10, Guatemala, p. 59, *id. t. c.* pl. vii.

Dycladia imitata, fig. 23, Guatemala, *pyrgion*, fig. 22, pl. vii., *flaviventris*, pl. viii. fig. 12, Panama, *augusta*, pl. vii. fig. 19, Guatemala, and *semifulva*, pl. viii. fig. 11, Panama, p. 62, *id. t. c.*

Argyroides eurypon, pl. vii. fig. 3, Guatemala, *laurion*, fig. 13, Panama, p. 64, and *menephron*, fig. 14, pl. viii., Panama, p. 65, *id. t. c.*

Trichura ribbei, *id. ibid.* fig. 15, Panama.

Napata guatemalena, *id. t. c.* p. 66, Guatemala.

Syntrichura placida, *id. ibid.* pl. vii. fig. 8, Guatemala.

Pterygopterus superbus, Druce, *t. c.* p. 67, pl. viii. fig. 7, Panama.

Procalypta victorina, *id. ibid.* fig. 16, Costa Rica, Panama.

Antichloris viridis, pl. vii. fig. 25, Panama, and *panacea*, pl. viii. fig. 17, Costa Rica, *id. t. c.* p. 68.

ARCTIIDÆ.

Druce, *Biol. Centr. Am. Lep. Het.* i. pp. 69-112, notes the synonymy, &c., of the following species:—*Aclytia heber*, Cram. (= *Sphinx halys*, Cram., and *Aclytia hylas*, Butl.), *Charidea arrogans*, Walk., *Charidea bella*, Guér. (= *hamatodes* and *eximia*, Boisd., *bivulnera*, Grote & Rob., and *Euchromia (Automolis) gloriosa*, Walk.), *Metriophyla apicalis*, Herr.-Schäff. (= *Euchromia albiplaga*, Walk.), *Heliura leneus*, Cram., *Rhipha subulifera*, Feld. (= *strigosa*, Butl.), *Epanycles obscura*, Möschl. (= *stellifera*, Butl.), *Mydromera isthmia*, Feld. (= *Agyrtia nolckeni*, Staud.), *Philoros venosa*, Walk., *Leucopsumis circe*, Cram. (= *Evagra affinis*, Boisd.), *Eucereon varium*, Walk., *arenosum*, Butl., and *costulatum*, Herr.-Schäff., *Halesidota caryæ* (= *annulifascia*, Walk., and *porphyrea*, Herr.-Schäff.), *strigulosa*, Walk. (= *citrina*, Walk.), *seruba*, Herr.-Schäff., *Sychesia fimbria*, Möschl. (= *Phæoptera subtilis*, Butl.), *breviuscula*, Walk. (= *Euhalesidota aperta*, Edw.), *Eppantheria eridane*, Hübn. (= *mazima*, *abscondens*, *garzoni*, *yucatanensis*, *alpha*, Oberth., *cunigunda*, Walk., and ? *icasia*, Cram.), *caudata*, Walk. (= *mexicana*, Oberth.), *leucarctioides*, Grote & Rob. (= *tenella*, Edw.), *extrema*, Walk. (= *chilensis*, Oberth.), *Arachnis aulæa*, Hübn. (= *incarnata*, Walk.), *Carales astur* (= *albicans*, Walk.), *Psychopasma erosa*, Herr.-Schäff. (= *Halesidota albidator*, Walk.), *Esthema bicolora*, Sulz. (= *Hypocrita dichroa*, Hübn.), *Eucyane pylotis*, Dru. (= *Calepidos celina*, Boisd.), *Hyalurga fenestra*, Clerck (= *Sphinx egeon*, Cram.), *Pericopis leucophæa*, Walk. (= *flora*, Butl., *Thebrone rubrimargo* and *Aphisson salvatoris*, Boisd.), *Pericopis lycaste*, Klug (= *dissimulans*, Walk., and *Chetone iscuriotes*, Boisd.), *marginalis*, Walk. (= *Dorimena magdala*, Walk.), *thetis*, Klug (= *Eucharis mariamne*, Hübn.), *bivittata*, Walk. (= *disjuncta*, Walk., *lucetia*, Butl., and *Chetone aorsa*, Boisd.); and figures *Belemnina jovis*, Butl., pl. viii. fig. 22, *Philoros ruficeps*, Walk. (= *Ctenucha opaca*, Boisd., fig. 8, *Theages leucophæa*, fig. 9, *Gippius sumptuosus*, Walk., fig. 16, *Elysium conspersus*, Walk., fig. 25, *Halesidota albiguttata*, Boisd., fig. 27, pl. ix., *Phæoptera mansueta*, Edw., fig. 1, *Eppantheria decora*, Walk. (= *haitensis*, Oberth., fig. 6), *Esthema euplæoides*, Butl., fig. 12, *Eucyane anacharsis*, Boisd., fig. 18, *excellens*, Walk., figs. 16 & 17, pl. x., *Composia olympia*, Butl., fig. 1, *Phaloesia saucia*, Walk. (= *flavicollis*, *venezuelæ*, and *chalybea*, Butl., and *Cocastrea gentilis*, Boisd.), fig. 2, *Acribia maculifrons*, Walk., fig. 3, *Pericopis jansoni*, Butl., fig. 10, and *arema*, Boisd., fig. 15, pl. xi.

Saalmüller, *Lep. Mad.* i., redescribes and figures *Callicereon heterochroa*, Mab., fig. 69 & 69a, p. 148, *Pelochyta vidua*, Cram. (= *Caelonia madagascariensis*, Boisd., and *Amblythyris radama*, Mab.), fig. 52, p. 150, and *Epirausis smithii*, Mab. (= *lanigera*, Butl.), figs. 53 & 53a, pl. v. p. 152.

Areas adspersa, Mab., fig. 89, p. 157, and *Euchates madagascariensis*, Butl., fig. 83, pl. vi. p. 158.

Arctia caja, Linn. (aberration) and *Nemeophila russula*, Linn. (herma-

phrodite), described and figured; Weymer, JB. Ver. Elberfeld, vi. pp. 70 & 76, pls. ii. fig. 3, & i. fig. 6.

Spilosoma cunea, Drury, and *Haesidota caryæ*, Harr., noticed as injurious to hop; Riley, Bull. Dep. Agric. Ent. U. S. iv. pp. 41 & 42.

Alope ricini, *Cretonotus interruptus*, Linn., and *Areas lacticina*, Cram. Transformations noticed; Forsayeth, Tr. E. Soc. 1884, pp. 395 & 396.

Arctia nais, Dru., *Spilosoma acraea*, Dru., *virginica*, Fabr., and *isabella*, Abb. & Smith. Notes on pupation, &c.; Bean, Canad. Ent. xvi. pp. 65-67.

Ctenucha rubriceps, Walk. (= *opaca*, Boisd.), and *vittigera*, Blanch. (? = *nivosa*, Walk.), noticed; Berg, An. Soc. Arg. xvi. p. 270.

Trichosoma breveti, Oberthür, redescribed and figured by him; Études d'Ent. ix. p. 36, pl. iii. fig. 14.

Ocnogyna parasita, Hübn.: note on larva; Frey, MT. schw. ent. Ges. vii. p. 19. *O. loewii*, Zell., var. *pallidior* from Askhabad described and figured; Christoph, in Romanoff's Mém. Léop. i. p. 109, pl. vii. figs. 1a & b (imago and larva).

Axiopæna maura, Eichw., pl. v. fig. 5, and *villica* var. *n. confluent*, pl. iv. fig. 9, noticed and figured; Romanoff, Mém. Léop. i. pp. 86 & 87.

Arctia. Revised list of N. American species; the following are the most important observations:—*A. saundersii*, Grote, is distinct from *persephone*, Kirb., which latter = *virgo*, Linn., var.; *A. flammea*, Neum., = *placenta*, Abb. & Smith, var.; *A. placenta* is distinct from *figurata*, Dru.; *A. anna*, Grote, is an aberration of *persephone*, Grote; *complicata*, Walk., = *achaia*, Grote & Rob., var., and *dahurica*, Boisd., may be the same; *blakei*, Grote, and *determinata*, Neum., may be distinct; *A. nevadensis*, Grote & Rob., = *interrupta*, H. Edw., var.; *A. gelida* and *speciocissima*, Möschl., = *quenselii*, Geyer; *A. mexicana*, G. & R., *antholea*, Boisd., and *arizonensis*, Streck., = *docta*, Walk.; *A. intermedia*, Streck., is distinct from *saundersii*, Grote, but *A. stretchii*, Grote, may = the former; *A. diene*, Abb. & Smith, is distinct from *arge*, Dru.: Neumoegen, Papilio, iii. pp. 148-151. *A. nais* and *phyllira*, Dru., are probably distinct; Hulst, Bull. Brooklyn Soc. vi. p. 120. *A. quenselii*, Payk., and *festiva*, Borkh.: transformations noticed, and those of the latter described; Sandberg, Ent. Tidskr. v. pp. 139-141: the former found among snow and ice in an intensely cold locality in Norwegian Finland; Aurivillius, Ent. Tidskr. v. pp. 203 & 230. *A. cervini*, Fall.: series of bred varieties noticed and figured; Christ, MT. schw. ent. Ges. vii. p. 44, plate.

Chelonia bieti, Oberthür, redescribed and figured by him; *op. cit.* ix. p. 20, pl. ii. fig. 11. *C. dahurica*, Boisd., Icones, = *maculosa*, Esp., var. *mannerheimii*, Dup. (= *chardinyi*, Boisd., Ind. Méth., and *honestia*, Freyer), but *dahurica*, Boisd., Lep. Cal., and Stretch, is a perfectly distinct Californian species (*virguncula*, Kirb.) allied to *C. quenselii*, Payk.; *id. op. cit.* viii. pp. 36 & 38, and Rev. mens. Ent. i. pp. 128-130. *C. carya*, Linn.: abnormal emergence; Clissold, Ent. xvii. p. 65.

Nemeophila plantaginis, Linn. Variety from the Shetland Isles noticed; Hoffmann, S. E. Z. xlv. pp. 356 & 357.

Callimorpha hera, Linn. Occurrence in Devonshire; Brooks, Ent.

xvii. pp. 233 & 234. Var. *lutescens*, Guén., and var. *lutea* noticed; Laboulbène & Mabille, Bull. Soc. Ent. Fr. (6) iii. pp. xciii. & cxxvii. Var. *saturnina* from the Pyrenees discussed; Oberthür, *op. cit.* viii. p. 36.

Euchates collaris, Fitch, *eglenensis*, Clem., and *egle*, Drury. Broods and transformations described; H. Edwards, Papilio, iii. pp. 145-148. For the last, cf. also French, Canad. Ent. xvi. pp. 221 & 222.

Spilosoma fuliginosa, Linn., and var. *fervida*, Staud., discussed; Fuchs, S. E. Z. xlv. pp. 258 & 259. *S. latipennis*, Stretch, noticed; H. Edwards, t. c. p. 190.

Halesidota cinctipes, Grote & Rob., discussed; *id. op. cit.* iv. p. 76.

Epantheria aulea, Boisd. Transformations described; Schaus, Papilio, iii. pp. 188 & 189.

New genera and species :—

Fodinoidea, Saalmüller, Lep. Mad. i. p. 154. Referred to the *Arctiidae*, but with a superficial resemblance to *Numenes* (*Liparidae*) and *Fodina* (*Noctuidae*). Type, *F. staudingeri*, sp. n., *ibid.* pl. v. fig. 63 & 63a, Betsileo.

Phryganopteryx, *id. t. c.* p. 155. *Arctiidae*; has some resemblance to *Halesidota* and *Macrobrochis*. Type, *M. strigilata*, Saalm. (redescribed and figured, t. c. p. 156, pl. vi. fig. 94).

Ametropalpis, Mabille, C. R. ent. Belg. xxviii. p. clxxxix. Affinities doubtful; probably allied to *Callimorpha* or *Lithosia*; head short, small palpi three times as long as head, compressed, scaly; 1st joint short, 2nd very long, 3rd shorter; proboscis as long as head and thorax. Type, *A. nasuta*, sp. n., *id. ibid.*, Madagascar.

Aclytia conspicua, Druce, Biol. Centr. Am. Lep. Het. p. 70, pl. viii. fig. 23, Guatemala, Panama.

Charidea costaricensis, fig. 20, Costa Rica, Panama, *panamensis*, Panama, p. 71, *xenodice*, figs. 18 & 19, Costa Rica, and *griseldis*, fig. 21, pl. viii., Mexico, p. 72, *id. t. c.*

Acreagris togata, *id. t. c.* p. 73, pl. vi. fig. 8, Guatemala, Costa Rica, Panama.

Metriophyla alpha (figured as *Heliura alpha*), *id. ibid.* pl. viii. fig. 24, Panama.

Heliura testacea, Guatemala, Panama, and *atava*, Panama, *id. t. c.* p. 74.

Automolis grandis, fig. 25, *lucinia*, fig. 26, Costa Rica, *imitata*, fig. 27, pl. viii., Mexico, Guatemala, and *sicilia*, Panama, *id. t. c.* p. 75.

Ischnognatha godmani, *id. t. c.* p. 76, pl. ix. fig. 1, Panama.

Pionia undulata, fig. 3, *obtusa*, Guatemala, *agnonides*, Nicaragua, *affinis*, fig. 4, Guatemala, p. 77, *elegans*, fig. 6, Panama, and *striata*, fig. 5, pl. ix., Nicaragua, Panama, p. 78, *id. t. c.*

Sutonocrea tripunctata, *id. t. c.* p. 79, pl. ix. fig. 2, Panama.

Epanycles gigantea, *id. t. c.* p. 80, pl. ix. fig. 7, Guatemala, Panama.

Otenucha affinis, *id. t. c.* p. 83, Guatemala; *C. votiva*, p. 13, *proxima* and *modulata*, p. 14, H. Edwards, Papilio, iv., Mexico.

Eucereon myrina, fig. 10, Guatemala, p. 84, *tripunctatum*, fig. 12, Guatemala, Panama, *myrtusa*, Costa Rica, p. 85, *maia*, fig. 13, Costa Rica, Panama, Ecuador, *hægei*, Mexico, p. 86, *leria*, fig. 14, Panama, Ecuador,

Bolivia, *minutum*, Panama, p. 87, *lutetia*, fig. 11, Panama, and *rogersi*, fig. 15, Costa Rica, Panama, p. 88, Druce, *t. c.* pl. ix. ; *E. imriei*, *id.* P. Z. S. 1884, p. 322, pl. xxv. fig. 6, Dominica.

Evius lineatus, *id.* Biol. Centr. Am. *Lep. Het.* i. p. 89, pl. ix. fig. 17, Panama.

Idalus crinis, Mexico, and *critheis*, Panama, *id. ibid.* figs. 18 & 19.

Neritos laodamia, *asana*, Panama, *chozeba*, Costa Rica, and *amastris*, Guatemala, *id. t. c.* p. 90, pl. ix. figs. 20-23.

Elysium clitus, *id. t. c.* p. 91, Costa Rica ; *E. russatus*, H. Edwards, *t. c.* p. 60, Mexico.

Mazæras ipsea, Druce, *t. c.* p. 91, pl. ix. fig. 24, Panama.

Nemeophila geddesi, Neumoegen, Papilio, iii. p. 137, Colorado.

Arctia eminens, H. Edwards, *t. c.* p. 59, Mexico.

Antarctia expressa, *id. t. c.* p. 60, Mexico.

Robinsonia perfecta, *id. ibid.*, Mexico.

Euchætes yosemitæ, *id. op. cit.* iii. p. 146, California ; *E. emendatus* and *fumidus*, p. 61, and *immanis*, p. 75, Mexico, *id. op. cit.* iv.

Seirarctia bolteri, *id. t. c.* p. 121, N. Mexico.

Dionychopus similis, Möschler (= *amasis*, Cram. var.), Verh. z.-b. Wien, xxxiii. p. 288, Caffraria.

Aletis forbesi, Druce, P. Z. S. 1884, p. 227, pl. xvii. fig. 4, W. Africa.

Halesidota minima, Neumoegen, *t. c.* p. 138, Arizona ; *H. atra*, Druce, Biol. Centr. Am. *Lep. Het.* i. p. 92, pl. ix. fig. 26, Guatemala ; *H. mansueta*, p. 75, *armillata* and *propinqua* (?= *caryæ* var.), p. 76, H. Edwards, *t. c.*, Mexico.

Euhalsidota aperta and *cervina*, *id. t. c.* p. 77, Mexico.

Phagoptera alba, Mexico, and *superba*, Panama, Druce, *t. c.* p. 95, pl. x. figs. 9 & 2.

Ecpantheria sennettii, Lintner, Papilio, iv. p. 147, Texas ; *E. tenella* (= *hemorrhoidalis*, Grote & Rob.), H. Edwards, *t. c.* pp. 15 & 41, Mexico ; *E. trebula*, fig. 3, Guatemala, and *cotyora*, figs. 4 & 5, Costa Rica, Druce, *t. c.* p. 97, pl. x.

Arachnis confusa, *id. t. c.* p. 99, Mexico.

Curales obscurata, *id. ibid.* pl. x. fig. 7, Mexico, Costa Rica.

Purius punctatus, *id. t. c.* p. 100, Guatemala.

Pseudapistosia lystra, *id. t. c.* p. 101, Panama and Colombia (?).

Opharus albipunctatus, fig. 11, British Honduras, Guatemala, *mundator*, fig. 10, Costa Rica, and *ruficollis*, fig. 8, Panama, *id. t. c.* p. 102, pl. x. ; *O. euchatiformis*, H. Edwards, *t. c.* p. 15, Mexico.

Gnophala arizona, French (= *hopfferi* var. *discreta*, Stretch), French, Papilio, iv. pp. 20 & 112, Arizona.

Eucyane ninonia, fig. 13, *arcei*, fig. 14, Panama, p. 104, and *phenicides*, fig. 15, Guatemala, p. 105, Druce, *t. c.* pl. x.

Phalœ Cimeri, figs. 4 & 5, Mexico, Yucatan, *verania*, fig. 7, Guatemala, p. 107, *helotes*, fig. 8, *tratschi*, fig. 9, and *cerealia*, fig. 6, Panama, p. 108, *id. t. c.* pl. xi.

Pericopis cerealis, figs. 11 & 12, Panama, p. 110, *lygdamis*, fig. 17, *leda*, fig. 13, Costa Rica, and *tibesis*, figs. 14 & 15, Mexico to Costa Rica, p. 111, *id. t. c.* pl. xi. ; *P. schausii*, H. Edwards, *t. c.* p. 59, Mexico.

LITHOSIIDÆ.

Saalmüller, Lep. Mad. i., redescribes and figures *Bizone angustata*, Walk. (= *hova*, Guén.), fig. 82, p. 161, *Sozusa trispilota*, fig. 84, p. 163, *Probbasa notifera*, Saalm., fig. 88, p. 165, *Setina imminuta*, fig. 78, p. 167, *Nudaria infantula*, Saalm., fig. 81, pl. vi. p. 168, *Autoceras nigropunctana*, Saalm. [pl. vii. (?), fig. 103, ined.], p. 169, *Nola musculalis*, Saalm., pl. vi. fig. 85, p. 171. The following known species are also specially noticed:—*Sozusa marginata*, Guér., *mabillei*, Butl., ♀, *argentea*, Butl., p. 103, and *Nola bryophiloides*, Butl., p. 172. Saalmüller also, t. c. pp. 159 & 160, notes the following synonymy:—*Utetheisa pulchella*, Hübn. (= *formosa*, Boisd.), *U. laymerisa*, Grand. (= *Deiopeia occultans*, Voll.), *Argina cribraria*, Clerck (= *Phalæna astræa*, Dru., *Bombyx pylotis*, Fabr., and *Deiopeia ocellina*, Walk.), *Anaphela stellata*, Guér. (= *luctifera*, Walk.), and *Ovios eumela*, Cram. (= *Noctua sylviana*, Stoll., and *Bombyx evidens*, Fabr.).

Setina roscida, W. V., and *Lithosia cereola*, Hübn. Transformations described; Rogenhofer, Verh. z.-b. Wien, xxxiv. pp. 155–157.

Deiopeia bella, Linn. Larva described; H. Edwards & S. L. Elliot, Papilio, iii. p. 128.

Emydia cribrum, Linn., var. *rippertii*, and *E. grammica*, Linn., varr. *xanthoptera* and *melanoptera*, from the Pyrenees, noticed; Oberthür, Études d'Ent. viii. pp. 34 & 35. *E. chrysocephala*, Hübn., is distinct from *E. cribrum*; Santos, J. Sci. Lisb. x. p. 123. *E. striata*, Linn., var. *melanoptera*, Brahm., noticed; Lampa, Ent. Tidskr. v. p. 150.

Setina irrorella, Clerck, var. *flavicans*, Boisd., noticed and figured; Romanoff, Mém. Léop. i. p. 84, pl. iv. fig. 8.

Nola confusalis, Herr.-Schäff., *centonalis*, Hübn. (new to Sweden), and var. *melanomos*, Nick., discussed; Lampa, t. c. pp. 96, 148–150, & 206. *N. ovilla*, Grote: transformations described; it belongs to the *Lithosiidæ* near *Clemensia*; Packard, Am. Nat. xviii. pp. 726 & 727.

Eulithosia, g. n., H. Edwards, Papilio, iv. p. 43. Allied to *Lithosia*. To include *E. composita* and *thoracica*, spp. nn., t. c. p. 44, Arizona.

New species:—

Deiopeia lactea, Butler, Rep. Zool. Coll. 'Alert,' p. 577, Providence Island (Mascarenes).

Lithosia cinnubarina, Pagenstecher, JB. nass. Ver. xxxvii. p. 216, Amboina; *L. cocciniceps*, Mabille, CR. ent. Belg. xxviii. p. clxxxix., Madagascar.

Josiodes distincta and *inversa*, H. Edwards, Papilio, iv. p. 14, Mexico.

Ameria (Eudule) nigricosta, id. *ibid.*, Mexico.

Melanchroia spuria, id. t. c. p. 15, Mexico.

Diophtis nervosus, id. *ibid.*, Mexico.

Nola interrupta, Pagenstecher, t. c. p. 218, Amboina; *N. incana*, Betsileo, p. 173, *præfica*, pl. v. figs. 57 & 57a, p. 174, *respersa* and *varia*, Nossi-Bé, p. 176, Saalmüller, Lep. Mad. i.; *N. gigas*, Butler, Ann. N. H. (5) xiii. p. 274, Yesso.

Prabhasa maculosa, pl. v. figs. 68 & 68a, Betsileo, and *angulosa*, Nossi-Bé, Saalmüller, t. c. pp. 166 & 167.

HYPSIDÆ.

Lacides fuscus, Fabr. Transformations described; Forsayeth, Tr. E. Soc. 1884, p. 397.

Hypsa barbonica, Boisd. (= *insularis*, Boisd.), noticed; Saalmüller, Lep. Mad. i. pp. 160 & 161. *H. dama*, Fabr., noticed from Nias; Snellen, Tijdschr. Ent. xxvii. p. lxxxii.

NYCTEOLIDÆ.

Sarrothripa undulana, Hübn., and varieties, and *Hylophila bicolorana*, Fuessly, discussed; Lampa, Ent. Tidskr. v. pp. 146-148.

Earias insulana, Boisd. Ravages in Egypt; Gsiller, Rov. Lapok, i. pp. 188 & xxv. The following synonyms are noted by Saalmüller, Lep. Mad. i. p. 178:—*E. smaragdina*, Zell., *siliquana*, Herr.-Schäff., and *frondosana*, Walk.

Earias citrina, sp. n., *id. ibid.*, Nossi-Bé.

Tortricomorpha diaphana, pl. vi. fig. 12, and *penthinoides*, spp. nn., Pagenstecher, JB. nass. Ver. xxxvii. pp. 290 & 291, Amboina.

NYCTEMERIDÆ.

Nyctemera celsia, Cram., noticed from Nias; Snellen, Tijdschr. Ent. xxvii. p. lxxxii. & lxxxiii. *N. mabiliei*, Butl. (= *biformis*, Mab.), noticed; *Helicomitra pulchra*, Butl., = *Caloschemia monilifera*, Mab.: Saalmüller, Lep. Mad. i. pp. 180 & 181.

Nyctemera gracilis, sp. n., Saalmüller, Lep. Mad. i. p. 179, pl. v. fig. 66, Nossi-Bé.

Pterothysanus lanaris, Shanghai, and *pictus*, Elephanta Island, spp. nn., Butler, Ann. N. H. (5) xiv. pp. 406 & 407.

CALLIDULIDÆ.

Cleosiris fasciata, Moore, figured by Waterhouse, Aid, iii. pl. cl. fig. 5.

LIPARIDÆ.

Saalmüller, Lep. Mad. i., redescribes *Artaxa fervida*, Walk. (figured, pl. vii. [?] figs. 115 & 116, ined.), p. 185, *Dasychira mascarena*, Butl. (pl. vii. [P] fig. 112, ined.), p. 195, *pumila*, Butl., pl. v. fig. 58, p. 196, and *procineta*, Saalm., pl. vi. figs. 91 & 92, p. 198.

Psalis securis, Hübn., *Euproctis lunata*, Walk., pl. xiv. figs. 5 & 5a-c, *Nioda usiformis*, Walk., pl. xv. figs. 5 & 5a-f, *Pseudomesa incerta*, Walk., *Perina nuda*, Fabr., pls. xiv. figs. 7 & 7a, & xv. figs. 6a-d, and *Trisula variegatâ*, Moore. Transformations described and in part figured; Forsayeth, Tr. E. Soc. 1884, pp. 399-404.

Orgyia leucostigma, Smith & Abb. (injurious to hop): transformations briefly described; Riley, Bull. Dep. Agric. Ent. U. S. iv. p. 41: larva described and figured; Forbes, Rep. Ins. Illin. xii. pp. 100 & 101, fig. 20: ravages and parasites; Saunders & Clarkson, Rep. E. Soc. Ont. 1883,

pp. 11 & 33. *O. nova*, Fitch, and *badia*, H. Edw., = *antiqua*, Linn.; H. Edwards, Papilio, iii. p. 190.

Liparis chrysorrhæa and *auriflua*. Urticating properties; "Balding." Randall, & Anderson, Ent. xvii. pp. 256, 257, 275, & 276.

Ocneria dispar, Linn., emerging from pupa without antennæ; Oudemans, Tijdschr. Ent. xxvii. p. xvi.

Anaphe panda, Boisd. Larval nest, allied species, &c., noticed; [Lord] Walsingham, Ent. xvii. pp. 92 & 93.

Brachysoma codeti, Austaut, noticed by him; Le Nat. vi. pp. 392 & 400.

New genera and species :—

Charala, Moore, Tr. E. Soc. 1884, p. 359. Allied to *Stilpnotia salicis*. Type, *S. sericea*, Moore.

Scaphocera, Saalmüller, Lep. Mad. i. p. 181. Allied to *Cypra*. Type, *C. marginepunctata*, Saalm. (redescribed and figured, t. c. p. 182, pls. v. fig. 76 & vi. fig. 97).

Demas flavicornis, J. B. Smith, Bull. Brooklyn Soc. vii. p. 3, New Jersey.

Orgya anceps, Oberthür, Études d'Ent. ix. p. 37, pl. iii. fig. 5, Algeria; *O. jankowskii*, id. op. cit. x. p. 13, pl. i. fig. 9, Sidemi.

Artaxa simulans, Butler, Ann. N. H. (5) xiii. p. 200, Amboina.

Pegella ichorina, id. t. c. p. 201, Amboina.

Leucoma xanthosoma, Saalmüller, Lep. Mad. i. p. 183, Nossi-Bé.

Lælia lilacina, Coonoor, Nilgiris, and *pallida*, Bombay, Moore, Tr. E. Soc. 1884, pp. 357 & 358.

Lælioides rubripennis, Burmah, and *lactea*, N. Punjab, id. t. c. p. 358.

Euproctis immaculata, id. *ibid.*, Java, Sikkim; *E. putilla*, Saalmüller, t. c. p. 184, Nossi-Bé.

Stilpnotia cretosa, id. *ibid.*, Nossi-Bé.

Numenes præstans, id. t. c. p. 187, Nossi-Bé.

Lymantria fumosa, pl. vi. figs. 79 & 79a, and *uxor* (? = *fumosa*, ♀), id. t. c. pp. 188 & 190, Nossi-Bé.

Calliteara clavis and *fuliginosa*, id. t. c. pp. 192 & 193, Nossi-Bé.

Dasychira crausis, Druce, P. Z. S. 1884, p. 228, pl. xvii. fig. 5, Lower Niger and (?) Old Calabar; *D. mabilli*, Rochebrune, and *colini*, Mabille, Bull. Soc. Philom. (7) viii. pp. 30 & 31, Senegambia; *D. phæosericea*, id. C.R. ent. Belg. xxviii. p. clxxxix., Madagascar; *D. superba*, H. Edwards, Papilio, iv. p. 79, Mexico.

PSYCHIDÆ.

HEYLAERTS, F. J. M. Observations synonymiques et autres relatives à des *Psychides*, avec descriptions de *novæ species*. C.R. ent. Belg. xxviii. pp. xxxiv.-xli.

The following are the most important observations:—*Psyche hirtella*, Boisd., = *angustella*, Herr.-Schaff.; *hispidella*, Boisd., = *opacella*, Herr.-Schaff.; *siculella*, Boisd., = *apiformis*, Rossi, var. *melasoma*, Staud.; *casanella*, Boisd., ? = *villosella*, Ochs.; *muscella*, Hübn., = *atra*, L. (= *plumifera*, Ochs.); *Oreopsyche pyrenæella*, Herr.-Schaff., var. *albescens*

from Asturias described (p. xxxv.) ; *Psyche surinamensis*, Möschl., and *leucosoma*, Snell., belong to *Eumeta* ; *Acanthopsyche ritsemæ*, Heyl., = *Perina nuda*, Fabr. ; *Kophene minor*, Moore, is a *Chalia* ; *Lansdownia*, Heyl., and *Bambalina*, Moore, = *Eumeta*, Walk. ; *Dappada*, Moore, = *Oiketicus*, Guild. ; *Oiketicoides*, Heyl., = *Chalia*, Moore. The following genera and species are probably not *Psychidæ* :—*Ecobia frauenfeldi*, *Conæca guildingi*, *Æcinea felderi*, Scott, *Æ. scotti*, MacL., *Aprata thwaitesii* and *machwoodii*, Moore, *Psychographa*, *Psychanisa*, *Pseudopasa*, *Labedera*, *Perina*, *Nemeta*, *Panisa*, *Gonometa*, *Entometa*, Walk., *Pero-phora*, Harr., *Oiketicus basiger*, Walk., *Phryganidea*, Pack., *Casphalia*, *Crexa*, and *Eupalia*, Walk. The following are true *Psychidæ* :—*Eumeta* and *Monda*, Walk., *Thyridopteryx*, Steph., and *Kophene*, Moore.

[HEYLAERTS, F. J. M.] Observations Psychologiques. *T. c.* pp. ccvii.—ccx.

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List of 16 Hungarian *Psychidæ*, with description and figure of the case of *Epichnopteryx undulella*, Rösslerst., ♀ ; Pável, Rov. Lapok, i. pp. 75–77 & ix., fig. 21.

List of *Psychidæ* (11 species) of Holland and Belgium ; Heylaerts, C. R. ent. Belg. xxviii. pp. xci.—xciv. He also, *t. c.* pp. c. & ci., criticizes Weyenbergh's new species of *Psychidæ* [vide *infra*].

Double pupa-case of a Psychide from Rio Janeiro ; Letzner, Z. E. Ver. schles. (2) ix. pp. xxvii.

Psyche leschenaulti, Staud., and var. *nigricans*, Staud., and *P. pyrenæella*, Herr.-Schäff., var. *albescens*. Habits, &c., noticed ; Oberthür, Études d'Ent. viii. pp. 39 & 40.

Pseudopsyche dembowskyi, Oberth., = *Preyeria sinica*, Moore ; Heylaerts, *t. c.* p. xlv.

Thyridopteryx ephemeraformis, Haw. Transformations noticed and figured ; Forbes, Rep. Ins. Illin. xii. p. 101, fig. 21. Habits and structure described ; Riley, P. Biol. Soc. Wash. ii. pp. 80–83.

Cochlophora, Gerst., and *Cochlophanes*, Staud. Heliciform larva-cases discussed and figured ; McLachlan, Ent. M. M. xxi. pp. 1, 2, 27, & 67.

Resemblance between *Homopsyche* and an *Homopterous* insect ; Butler, P. E. Soc. 1884, p. xx.

Animula dichroa, Herr.-Schäff. Case and pupa described ; Heylaerts, *t. c.* pp. xcvii. & xcvi.

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Lalia lilacina, Coonoor, Nilgiris, and *pallida*, Bombay, Moore, Tr. E. Soc. 1884, pp. 357 & 358.

Laelioides rubripennis, Burmah, and *lactea*, N. Punjab, id. t. c. p. 358.

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Resemblance between *Homopsyche* and an *Homopterous* insect; Butler, P. E. Soc. 1884, p. xx.

Animula dichroa, Herr.-Schäff. Case and pupa described; Heylaerts, *t. c.* pp. xevii. & xeviii.

Perophora. The larvæ of more than one species utter a low musical note ; Jones, Naturalist (2) ix. p. 130.

Deborrea, g. n., Heylaerts, C.R. ent. Belg. xxviii. p. xxxvii. Type, *D. malgassa*, sp. n., *ibid.*, Madagascar.

New species :—

Psyche cassie, figs. 1-6, p. 9, *burmeisteri*, figs. 7 & 8, p. 14, and *bergii*, figs. 9-11, p. 17, Weyenbergh, Tijdschr. Ent. xxvii. pl. ii., Argentine Republic ; *P. wockei*, Standfuss, S. E. Z. xlv. p. 205, Italy.

Oiketictus tabacillus, Weyenbergh, t. c. p. 20, pl. ii. figs. 12 & 13, Argentine Republic.

Animula dimidiata and *basalis*, Heylaerts, C.R. ent. Belg. xxviii. p. xxxviii., locality unknown. (The first probably = *Psychoglene basinigra*, Feld & Rog. ; *id.* t. c. p. cxlix.)

Eumeta japonica, Japan, and *brasiliensis*, Pinal, Brazil, *id.* t. c. p. xl. ; *E. (?) zelleri*, *id.* t. c. p. xcvi., Caffraria (case and larva only described).

Pentophora bolivari, *id.* t. c. p. xli., Venezuela.

Nemeta sumatrensis, *id.* t. c. p. xlii., Sumatra.

Manatha edwardsii, *id.* t. c. p. ci., Texas.

Chalia rileyi, *id.* t. c. p. ccviii., Texas.

— *salax*, *id.* Notes Leyd. Mus. vi. p. 132, Liberia (larva only)..

NOTODONTIDÆ.

H. Edwards & S. L. Elliot, Papilio, iii. pp. 129 & 130, describe the larvæ of *Gluphisia trilineata*, Pack., *Notodonta stragula*, Grote, *Ædemia concinna*, Abb. & Smith, and *Cerura cinerea*, Walk.

Dicranura vinula, Linn., emerging from the cocoon, although attacked by a parasite ; Hearder, Ent. M. M. xx. p. 227.

Harpyia ceruginosa and *interrupta*, Christoph, noticed ; Grumm-Grshimaïlo, in Romanoff's Mém. Léop. i. p. 173.

Lophopteryx sieversi, Mén., noticed ; Teich, S. E. Z. xlv. p. 212.

Petasia nubiculosa, Esp. Retarded emergence ; Tugwell & Adkin, Ent. xvii. pp. 111 & 142.

Clostera timonides, Brem., redescribed and figured ; Oberthür, Études d'Ent. x. p. 13, pl. ii. fig. 2.

Datana. North American species discussed ; H. Edwards, Papilio, iv. pp. 23-26.

Lochmaeus tessella, Packard. Transformations described by him ; Am. Nat. xviii. pp. 1044 & 1045.

New genera and species :—

Acronyctodes, H. Edwards, Papilio, iv. p. 78. Allied to *Amatelodes*. Type, *A. insignata*, sp. n., *ibid.*, Arizona.

Rhenea, Saalmüller, Lep. Mad. i. p. 242. *Notodontidæ*. Type, *R. circumcincta*, Saalm. (redescribed and figured, *ibid.* pl. vi. fig. 77).

Acroctena, *id.* t. c. p. 244. *Notodontidæ*. Type, *A. fissura*, sp. n., *id.* *ibid.* pl. v. figs. 70 & 70a, Nossi-Bé.

Zaranga, Moore, Tr. E. Soc. 1884, p. 357. *Notodontidæ*. Type, *Z. pannosa*, sp. n., *ibid.*, Umballa District.

Heterecampa lunata, Arizona, *muscosa*, Mexico, and *superba*, Texas, H. Edwards, Papilio, iv. pp. 44, 79, & 121.

Spatalia dives, Oberthür, Études d'Ent. x. p. 15, pl. i. fig. 1, Sidemi.

Ptilodontis ornata, *id. ibid.* pl. ii. fig. 5, Sidemi.

Notodonta meticolodina, *id. t. c.* p. 16, pl. i. fig. 3, Sidemi.

Diloba mus, *id. t. c.* p. 17, pl. ii. fig. 4, Sidemi.

Apatelodes vivax, H. Edwards, *t. c.* p. 77, Mexico.

Datana drezelii, *id. t. c.* p. 25, United States.

Phalera haasi, Saalmüller, Lep. Mad. i. p. 245, pl. v. fig. 54, Betsileo.

Carea obsolescens, Moore, Tr. E. Soc. 1884, p. 356, Bombay, Coonoor.

LIMACODIDÆ.

Saalmüller, Lep. Mad. i., redescribes and figures *Miresa pyrosoma*, Butl., pl. v. figs. 73 & 73a, p. 200, *Anzabe micacca*, Butl., figs. 72 & 72a, pl. v. p. 201, *Parasa ebenau*, pl. iv. fig. 50, p. 203, *Macrosemyra pinguis*, Saalm., fig. 98, p. 205, *marmorata*, Saalm., fig. 75, p. 206, and *exsanguis*, Saalm., fig. 90, pl. vi. p. 207. At p. 202, *Limacodes florifera*, Herr.-Schäff., is noted as = *Latoia albifrons*, Guér.

Miresa albipuncta, Herr.-Schäff., figs. 8 & 8a-c (larva and pupa), *Aphen-dala tripartita*, Moore, fig. 14 (pupa), and *Parasa lepida*, Cram. Transformations described; Forsayeth, Tr. E. Soc. 1884, pp. 397-399, pl. xiv.

Parasa chloris and *Adoneta spinuloides*, Herr.-Schäff., and *Limacodes scapha*, Harr. Larvæ described; H. Edwards & S. L. Elliot, Papilio, iii. pp. 128 & 129.

Limacodes codeti, Oberthür, redescribed and figured by him; Études d'Ent. ix. p. 38, pl. iii. fig. 4.

Phobetrum pitheciun, Abb. & Sm., confounded with *Thyridopteryx ephemeræformis*, Haw., in Canada; Kellicott & Kilman, Canad. Ent. xvi. pp. 180 & 200.

New genera and species :—

Varina, Neunmoegen, Papilio, iv. p. 94. To be placed between *Parasa* and *Phobetron*. Type, *V. ornata*, sp. n., *ibid.*, Central Florida.

Prosternidia, Saalmüller, Lep. Mad. i. p. 208. Apparently allied to *Semyra*. Type, *P. metallica*, sp. n., *t. c.* p. 209, pl. v. figs. 65 & 65a, Betsileo.

Scopelodes testacea, Butler (= *unicolor*, Walk., nec Westw.), Ent. M. M. xxi. p. 156, Silhet, Mulmein.

Parasa reginula, Saalmüller, Lep. Mad. i. p. 204, pl. iv. figs. 49 & 49a, b, Nossi-Bé.

Aphen-dala tripartita, Manpuri, Jubbulpore, and *divaricata*, Silcui, Cachat, Moore, Tr. E. Soc. 1884, p. 376.

DREPANULIDÆ.

Cilix spinula, W. V. Curious resemblance to a species of *Flata*; Distant, P. E. Soc. 1884, p. xx.

Drepana acuta, Grote: supposed occurrence in N. America; Butler, Papilio, iii. p. 190. *D. cultraria*, Fabr., and var. *minor*, Fuchs, discussed; Fuchs, S. E. Z. xlv. pp. 259 & 260.

Platypteryx hamula, W. V.: ♂ pairing with 2 ♀♀ in succession; Archer, Ent. M. M. xx. p. 228. *P. unguicula*, Hübn.: irregularity of appearance; Rayner, Ent. xvii. p. 39.

Cilix tenax, sp. n., Saalmüller, Lep. Mad. i. p. 217, pl. v. fig. 62, Nossi-Bé.

Problepsis meræaria, sp. n., *id. t. c.* p. 218, pl. v. figs. 67 & 67a, Nossi-Bé.

Oreta carnea, sp. n., *id. t. c.* p. 220, Nossi-Bé.

SATURNIIDÆ.

WAILLY, A. Notes on the rearing of silk-producing Bombyces in 1883.

J. Soc. Arts, xxxii. pp. 357-360; P. E. Soc. 1884, p. xxii.; Bull. Soc. Acclim. (4) i. pp. 929-944.

These papers relate to *Saturniidae*; other notices on the subject are scattered through Bull. Soc. Acclim. (4) i., the most important being perhaps those by Hignet & Fallou (*t. c.* pp. 291-293, 814-823, 984, & 985).

Notes on the cocoons of *Attacus polyphemus*, Cram., *cecropia*, Linn., *cynthia*, Dru., *luna*, Linn., and *promethea*, Dru.; Clarkson, Canad. Ent. xvi. p. 25.

Actias luna and *Attacus cecropia*, Linn., figured; Fyles, Rep. E. Soc. Ont. 1883, p. 64, figs. 33 & 34.

Antheræa menippe, Westw., and *Bunæa cafferaria*, Stoll. Larvæ and spine of former noticed and figured; Bairstow, Naturalist (2) ix. p. 136, pl. viii. figs. 1, 1a, & 2.

Saalmüller, Lep. Mad. i. pp. 221-223, specially notices *Bunæa aslauga*, Kirb., *Copaza auricolor*, Mab., and *Antheræa suraka*, Boisd.

On hybridism in N. American *Saturniidae*; [Mrs.] Fernald, Papilio, iv. p. 42.

Attacus cynthia, Dru.: acclimatisation in France; Mabilie, Bull. Soc. Ent. Fr. (6) iii. p. cxxvii. *A. cinctus*, Tepper: on rearing from the cocoon; [Miss] M. E. Murtfeldt, Canad. Ent. xvi. pp. 131 & 132. *A. pernyi*, Guér.: on rearing; Fallou, Bull. Insect. Agric. ix. pp. 72-77, fig. 7.

Samia. Abnormal specimen; Kirby, Canad. Ent. xvi. pp. 22 & 23. *S. cecropia*, Linn.: curious case of hyperparasitism, a cocoon being infested both by *Ophion macrurum*, Say, and by a Lepidopterous larva, the latter being itself destroyed by a *Tachina*; Clarkson, Canad. Ent. xv. p. 208: mode of splitting wings for microscopic examination; Dimmock, Psyche, iv. p. 170. *S. ceanothi*, Behr, pairing with *cecropia*, Linn., and *columbia*, Smith; Pilati & Cook, Papilio, iii. pp. 191 & 192. *S. ceanothi* assembling; Bruce, Papilio, iii. pp. 190 & 191. *S. columbia*: pupæ infested by *Ophion macrurum*; Weed, Papilio, iv. p. 112.

Callosamia angulifera, Walk., noticed; Moffat, Canad. Ent. xvi. pp. 119, 120, & 180. *C. promethea*, Dru.: transformations popularly described and figured; Saunders, Canad. Ent. xv. pp. 231-233, figs. 10-13:

mode of feeding of larvæ ; Jack, Psyche, iv. p. 169 : larva devoured by orioles ; Hill, Canad. Ent. xvi. p. 120.

Antheræa (Telæa) polyphemus, Cram. Aberration described ; Conradi, Canad. Ent. xvi. pp. 23 & 24.

Bunæa aslauga and *thomsonii*, Kirb., figured by Waterhouse, Aid, iii. pl. cxlii. figs. 1 & 2.

Actias luna, Linn., briefly described and figured, with larva ; W. Saunders, Rep: Fruit-Growers' Ass. Ont. 1882, pp. 274 & 275, figs. 14 & 15. Note on rearing : Grapes, Ent. xvii. p. 42.

Saturnia pavonia, Linn. : note on transformations ; Sandberg, Ent. Tidskr. v. p. 142 : note on Italian specimens ; Standfuss, Z. E. Ver. schles. (2) ix. p. xxxii. *S. carpeni*, W. V. : cocoons with double outlet ; Gerth, Z. E. Ver. schles. (2) ix. p. xxxiv. : two pupæ in one cocoon ; Frohawk, Ent. xvii. p. 73 ; Preiss, Ent. Nachr. x. pp. 159-162. *S. pyri*, W. V. : a single specimen appearing in August, when others of the same brood appeared as usual in May ; Ébrard, Bull. Soc. Ent. Fr. (6) iii. p. xcix.

Hyperchiria io, Fabr. On forcing pupæ ; Fischer, Canad. Ent. xvi. p. 49.

Aglia tau, Linn., ab. *fere-nigra* from Thuringia described ; Thierry-Mieg, Le Nat. vi. p. 437.

Hemileuca, Walk. Note on the various forms ; *Euleucophaeus tricolor*, Pack., is not generically distinct ; Butler, P. E. Soc. 1884. pp. xii. & xiii.

Ceranchia mucida, sp. n., Saalmüller, Lep. Mad. i. p. 223, Betsilio.

Hyperchiria schausii, sp. n., H. Edwards, Papilio, iv. p. 16, Mexico.

Hemileuca electra, sp. n., Wright, Papilio, iv. p. 19, S. California.

Euleucophaeus hualapai, sp. n., Neumoegen, Papilio, iii. p. 138, Arizona.

CERATOCAMPIDÆ.

Ceratocampa imperialis, Dru : cannibalism of larva ; Hitchings, P. E. Soc. 1884, p. xxvi. *C. (Citheronia) regalis*, Fabr. : notes on pupation, food-plants, times of appearance, &c. : Harrington, Clarkson, & Davis, Canad. Ent. xvi. pp. 15, 16, 47, 48, 132, 133, & 140.

Citheronia infernalis, sp. n., Strecker, Papilio, iv. p. 73, Maryland, N. Carolina.

Anisota suprema, sp. n., H. Edwards (with description of larva by Schaus), Papilio, iv. pp. 16, 102, & 103, Mexico.

BOMBYCIDÆ.

Bombyx mori, Linn. Observations on its decapitation, and on crossing different races ; Passerini & Pasquali, Bull. Ent. Ital. xvi. pp. 285, 286, 330, & 531. Osage orange (*Maclura aurantiaca*) as a food-plant ; Riley & Des Lauriers, Am. Nat. xviii. pp. 78 & 79. Pasteur's observations on its diseases noticed ; Nature, xxxi. p. 141. Diseases in China ; Ramé, Bull. Insect. Agric. ix. pp. 77 & 78, and J. Soc. Arts, xxxii. pp. 192 & 193. Destroyed by *Ulschimyia sericaria*, Rond., in Japan ; Sasaki,

Nature, xxx. pp. 435 & 436. On sericulture and the silk trade in France and Switzerland; Ann. Soc. Agric. Lyon (5) vi. pp. 79-88 and tables, and J. Soc. Arts, xxxii. pp. 573, 1085, 1086, 1097, & 1098: in Italy, Bull. Ent. Ital. xvi. p. 143: in Hungary; Rov. Lapok, i. pp. 227-230, xxviii., & xxix.: in Mexico; C.R. ent. Belg. xxviii. pp. xlv.-xlviii.: in the United States; Bull. Insect. Agric. ix. pp. 142-144: in New Zealand; Federli & Hutton, N. Z. J. Sci. ii. pp. 233 & 234: in Assam; official report by Stack (cf. Ent. M. M. xxi. pp. 159 & 160).

Trilocha albicollis, Walk. Transformations described and figured; Forsayeth, Tr. E. Soc. 1884, p. 408, pl. xv. figs. 10 & 10a.

LASIOCAMPIDÆ.

KEFERSTEIN, A. Der *Bombyx* oder *Bombylius* des Aristoteles als Seide hervorbringendes Insect. Verh. z.-b. Wien, xxxiv. pp. 123-130.

The writer refers to the various notices in classical authors, and arrives at the conclusion that *Gastropacha otus*, Dru., was the insect to which most of them alluded.

Saalmüller, Lep. Mad. i., redescribes and figures *Borocera marginepunctata*, Guér., pl. v. figs. 74 & 74a, p. 224, and his own *Hydrias graphiptera*, pls. iv. fig. 47, & vi. fig. 96 (♀ = *Bombyx echinata*, Saalm.), p. 236, and *bosei*, Saalm., pl. vi. fig. 87, p. 238.

Chilena strigula, Walk., pl. xiv. figs. 6 & 6a, b, *Trabala vishnu*, Lef., *Megasoma venustum*, Walk., and *Lebeda buddha*, Lef., pl. xv. figs. 3 & 3a, b. Transformations described, and in part figured: Forsayeth, Tr. E. Soc. 1884, pp. 404-408.

Lasiocampa pini and *Bombyx quercus*, Linn. Hermaphrodites described and figured; Wachtl, Wien. ent. Z. iii. pp. 72 & 73, fig., & p. 290, pl. γ. fig. 3.

Chondrostege pastrana var. *hyrcana*, Staud. Larva noticed and figured; Christoph, in Romanoff's Mém. Léop. i. p. 115, pl. vii. fig. 5.

Bombyx castrensis, Linn., var. *veneta*, and aberr. *hilleri* from Venetia, described; Standfuss, S. E. Z. xlv. pp. 193-195. *B. neustria* and *castrensis*, Linn., and *franconica*, W. V.: hybrids discussed; *id. t. c.* pp. 195-199. *B. neustria* transforming without cocoon; Rabaud, Feuille. Nat. xiv. p. 118. *B. canensis*, Millière, = *populi*, Linn., var. *alpina*, Zell.; Frey, MT. schw. ent. Ges. vii. p. 18. *B. rubi*, Linn., ♂ containing eggs (!); Purrmann, Z. E. Ver. schles. (2) ix. p. xxv.

Lasiocampa lunigera and var. *lobulina*, Esp.: development, and alteration of broods discussed; Fuchs, S. E. Z. xlv. pp. 270-272. *L. potato-ria*, Linn.: anatomy of larva; Lameere, Feuille. Nat. xv. pp. 13-17.

Odonestis potato-ria, Linn. Hermaphrodites; Christy & Meldola, P. Ess. Club, iii. p. lxxxiii.

Murtida lineosa, Walk., redescribed; Moore, Tr. E. Soc. 1884, p. 371.

Tolyte velleda, Stoll, and *laricis*, Fitch. Larvæ described; H. Edwards & S. L. Elliot, Papilio, iii. pp. 130 & 131. Egg of the former described; H. Edwards, *t. c.* p. 189.

Eriogaster lanestris, Linn. Pupation and postponed emergence; Tutt & Clifford, Ent. xvii. pp. 142 & 164.

Clisiocampa sylvatica, Harr., popularly described and figured, with larva; W. Saunders, Rep. Fruit-Growers' Ass. Ont. 1882, pp. 273 & 274, figs. 12 & 13.

Gloveria, Pack. Amended description; *G. arizonensis*, Pack., ♂, and 4 new species described; *Quadrina diazoma*, Grote, is probably congeneric: H. Edwards, Papilio, iv. pp. 105-109.

New genera and species :—

Palirisa, Moore, Tr. E. Soc. 1884, p. 360. *Lasiocampidæ*. Types, *Jana lineosa*, Walk., and *cervina*, Moore.

Spalyria, id. t. c. p. 370. *Lasiocampidæ*. Type, *Bombyx collaris*, Guér.

Syrastrena, id. t. c. p. 373. *Lasiocampidæ*. Type, *Metanastria minor*, Moore.

Gastromega, Saalmüller, Lep. Mad. i. p. 226 (neuration figured). Allied to *Borocera*. Types, *Lebeda badia* and *cervicolora*, Saalm. (redescribed and figured, t. c. pp. 227 & 229, pl. iv. figs. 44, 44a, 45, & 46). (*G. cervicolora* may = *L. cowani*, Butl.; cf. p. 235.)

Libethra, id. t. c. p. 230. Allied to *Lebeda*. To include *L. cajani*, Vins., and *L. jejuna*, figs. 55 & 55a, p. 230, var. *brunnea*, figs. 56 & 56a-b, p. 231, and *punctillata*, fig. 71 & 71a, pl. v. p. 232, t. c., spp. nn., all from Betsileo.

Lerodes, id. t. c. p. 233. Placed after *Anchirithra*. Type, *A. fulgurita*, Saalm. (redescribed and figured, t. c. pl. vi. fig. 86).

Glocia, id. t. c. p. 234. Placed after *Eutricha*. Type, *G. solida*, sp. n., *ibid.* pl. v. figs. 64 & 64a, Nossi-Bé.

Protophenes, id. t. c. p. 240. Allied to *Lechriolepis*; but nearer *Clisiocampa* in neuration. Type, *Trabala stumpfi*, Saalm. (redescribed and figured, t. c. pl. iv. fig. 48).

Ganisa similis, Moore, Tr. E. Soc. 1884, p. 359, Darjiling.

Apha flava, id. *ibid.*, Nilgiris.

Tagora discrepans, id. t. c. p. 360, Bombay.

Eupterote subdita, *vinosa*, Jubbulpore, *cupreipennis*, Madras, p. 361, *suffusa*, *variegata*, Jubbulpore, *griseipennis*, N. India, p. 362, *dissimilis*, N.W. Himalaya, *contaminata*, Bombay, *sinuata*, Himalayas, p. 363, *con-similis*, Darjiling, *auriflua*, Malabar, *todara*, Nilgiris, p. 364, *castanoptera*, Nepal, *nigricans*, Jubbulpore, Saugor, p. 365, *alterata*, Darjiling, *permutata*, Bengal, *immutata*, Nepal, p. 366, *mollis*, Bombay, Coonoor, *caliginosa*, Jubbulpore, *lativittata*, Bombay, p. 367, *persimilis*, Calcutta, *dissimilis*, Deyra Dhoon, N.W. Himalaya, *cinnamomea*, Canara, S. India, p. 368, *similis*, Calcutta, *decorata*, Punjab, and *affinis*, N. India, p. 369, id. t. c.

Murlida fraterna, id. t. c. p. 371, Darjiling.

Brachyptera primivialis, id. *ibid.*, Nilgiris, &c.

Sangatissa albipars, id. t. c. p. 372, Bombay.

Messata flavida and *castanoptera*, id. *ibid.*, Nilgiris.

Apona shevaroyensis, id. t. c. p. 373, Madras.

Nisaga modesta, id. *ibid.*, N. India.

Gastropacha divaricata, id. t. c. p. 374, Darjiling.

Trabala irrorata, Moore, *t. c.* p. 375, Java, Mergui.

Lebeda fasciata, Khasia Hills, and *purpurescens*, Borneo, *id. t. c.* pp. 375 & 376.

Lenodora signata, Bengal, Deyra Dhoon, *fusca*, Bombay, and *fasciata*, Coonoor, Nilgiris, p. 374, *id. t. c.*

Bombix bilineata and *subulva* [sic], Mabilie, Bull. Soc. Philom. (7) viii. p. 31, Senegambia.

Pachygastria niris, Druce, P. Z. S. 1884, p. 228, pl. xviii. fig. 6, Lower Niger.

Gloveria dentata, p. 107, *olivacea*, *venerabilis*, p. 108, and *jalapa*, p. 109, H. Edwards, Papilio, iv., Jalapa, Mexico.

ZEUZERIDÆ.

Cossus centerensis, Lintn.: emergence from pupa noticed; Fletcher, Canad. Ent. xv. p. 203, and Rep. E. Soc. Ont. 1883, p. 16. *C. ligniperda*, Linn., noticed; Bull. Insect. Agric. ix. pp. 157, 158, 167, & 168: on its occurrence in Ireland, and on the supposed cannibalism of the larva; Flemyng, Ent. xvii. p. 10. *C. robinia*, Peck, assembling and flying by daylight; Bruce, Papilio, iii. p. 190.

Hypopta castrum, Hübner, destructive to asparagus at Constantinople; Poujade, Bull. Soc. Ent. Fr. (6) iv. p. cvii.

Zeuzera pyrina, Linn. (= *asculi*, Linn.), noticed; Sandahl, Ent. Tidskr. v. p. 162. Flying by day; Douglas, Ent. M. M. xvi. pp. 90 & 91.

Phragmataecia. Supposed new species from Livonia noticed; Teich, S. E. Z. xlv. pp. 211 & 212. *P. rubricosa*, Harr.: transformations described; H. Edwards & S. L. Elliot, Papilio, iii. pp. 127 & 128.

Spirocera, Boisd. *Phalæna coras*, Cram., which has been referred to the *Psychidæ*, belongs to this genus; Heylaerts, Notes Leyd. Mus. vi. p. 133.

New genera and species:—

Romanoffia, Heylaerts, C.R. ent. Belg. xxviii. p. xciv. *Cossina*. Type, *R. imperialis*, sp. n., *t. c.* p. xcv. (figs. of neurulation, pp. xciv. & cl.), Chiriqui.

Holocerus, Standinger, in Romanoff's Mém. Léop. i. p. 140. New section of *Cossus*, with laterally compressed and furrowed antennæ. Types, *C. (H.) nobilis* and *holosericeus*, spp. nn., *t. c.* pp. 139 & 141, pl. ix. figs. 1 & 2a, b, Ashkhabad.

Cossus stumpfi, Saalmüller, Lep. Mad. i. p. 210, Nossi-Bé.

Hypopta manfredi, Neumoegen, Papilio, iii. p. 139, Arizona; *H. mucosus*, Christoph, in Romanoff's Mém. Léop. i. p. 111, pl. vii. fig. 2, Ashkhabad.

Endagria agilis, Krasnovodsk, and *clathrata*, Kisil-Arvat, *id. t. c.* pp. 113 & 114, pl. vii. figs. 3a, b, & 4.

HEPIALIDÆ.

Hepialus humuli, Linn.: unusually rich colour of ♀ in 1884; Porritt, Naturalist (2) x. p. 104. *H. humuli* ab. *hethlandica*, Staud., and *H.*

velleda, Hübn., from the Shetlands, discussed; Hoffman, S. E. Z. xlv. pp. 357-359. *H. latus*, Stand. (? = *sylvinus*, Linn.), discussed and figured; Romanoff, Mém. Lép. i. p. 90, pl. v. figs. 3 & 4.

Hepialus confusus, H. Edwards, Papilio, iv. p. 122, Alaska; *H. mloko-sevitschi*, Romanoff, Mém. Lép. i. p. 91, pl. iv. fig. 10, Lagodekhi: spp. nn.

CYMATOPHORIDÆ.

Thyatira batis, Linn., var. *mexicana* described; H. Edwards, Papilio, iv. p. 16.

Ceropacha ridens, Fabr. Variety noticed; Bignell, Ent. M. M. xxi. p. 22.

Cymatophora or, W. V.: life-history; Gauckler, Ent. Nachr. x. pp. 309-311. *C. pampinaria*, Guén. (injurious to cranberry): life-history, ravages and remedies discussed; Riley, Bull. Dep. Agric. Ent. U. S. iv. pp. 26-28.

Risoba repugnans and *obstructa*, Walk., redescribed and figured, the latter with transformations; Moore, Lep. Ceyl. iii. pp. 1 & 2, pl. cxliv. figs. 1 & 2a, b.

NOCTUIDÆ.

HULST, G. D. The Genus *Catocala*. Bull. Brooklyn Soc. vii. pp. 13-56, pl. i.

Includes general remarks on structure, transformations, affinities, &c., and a synopsis of N. American species, 78 being admitted, besides a large number of varieties (some new). The plate illustrates generic details. Three sections are admitted in the genus: *Catocalirhus*, Andrews, for *Parthenos nubilis*, Hübn., *Catocala* (type), and *Catabapta*.

Secondary sexual characters of *Noctua* and *Deltoidæ*; J. B. Smith, Bull. Brooklyn Soc. vii. p. 89, and Canad. Ent. xvi. p. 175.

Noctua observed at Bromley in 1884; Watchurst, Ent. xvii. pp. 278-280.

The following known species are described and (generally) figured by Moore, Lep. Ceyl. iii.:—*Bryophila semipars*, p. 3, *Dipthera deceptura*, Walk., p. 4, *Plataplecta pruinosa*, Guén. (= *Polia soluta*, Walk.), fig. 3, p. 5, *Arylia fasciata*, Moore, fig. 6, pl. cxliv. p. 7, *Sesamia inferens*, fig. 3, p. 8, *Arsilonche confusa*, fig. 4, *Leucania separata*, p. 9, *decissima*, Walk. (= *nareda*, Feld. & Rog.), *lanceata*, Moore, fig. 5, *prisca*, Walk., p. 10, *tangala*, Feld. & Rog., *exempta*, Walk., p. 11, *Crambopsis excludens*, Walk., p. 12, *Polytela gloriosa*, Fabr., figs. 1 & 1a, p. 13, *Glottula dominica*, Cram., figs. 2 & 2a, p. 14, *Hydræcia lampadifera*, Walk., p. 15, *Sasunaga tenebrosa*, Moore, fig. 7, p. 16, *Dypterygia subcurva*, Walk. (= *postica*, Walk.), fig. 8, pl. cxlv., *Laphygma obstans*, p. 17, *trajiciens*, Walk., p. 18, *Prodenia littoralis*, Boisd. (= *Noctua retina*, Freyer, *Prod. ciligera* and *testaceoides*, Guén., and *P. glaucistriga*, *subterminalis*, and *declinata*, Walk.), figs. 1 & 1a, b, *P. nubes*, Guén. (= *Spodoptera filium*, Guén., and *Prod. infecta*, *insignata*, *venustula*, and *permunda*, *Agrotis transducta* and *submarginalis*, and *Laphygma squalida*, Walk.), p. 19, *P. apertura*,

Walk., p. 20, *Calogramma festiva*, Don. (= *Polia picta*, Boisd.), fig. 6, *Neuria retrahens*, p. 21, *dissecta*, fig. 7, *discrepans*, p. 22, *Oxiba ochracea*, p. 23, *Mamestra opposita*, p. 24, *Berresa natalis*, fig. 3, p. 26, *Platitia cephusalis*, Walk. (= *Miana inornata* and *Perigea leucospila*, Walk.), figs. 4 & 4a, pl. cxlvi., *Apamea pannosa*, Moore, fig. 1, p. 27, *consanguis*, Guén. (= *undicilia*, Walk.), *Perigea centralis*, Walk. (= *P. canorufa* and *illecta*, *Celæna serva*, and *Hadena spargens*, Walk., and *H. taprobane*, Feld. & Rog.), figs. 2 & 2a, p. 28, *Amyna selenampha*, Guén. (= *Alamis spoliata* and *Hadena latipennis*, Walk.), figs. 3 & 3a, p. 30, *Agrotis aris-tifera*, Guén., fig. 5, *punctipes*, p. 32, *congrua*, *conspurcata*, Walk., figs. 7 & 7a, *suffusa*, Gmel., fig. 6, pl. cxlviii. p. 33, *Tiracola plagiata*, Walk. (= *Agrotis plagifera*, Walk.), figs. 1 & 1a, p. 34, *Trachea auriplena*, fig. 2, *Eurois inclusa*, Walk., p. 37, *Astrapetis indistans*, Guén. (= *Hadena confundens* and *inextricans*, Walk.), fig. 5, pl. cxlviii., *ruptistriga*, p. 38, *Lithophane deflexa*, p. 39, *inchoans*, p. 40, *Ariola celisigna*, Walk. (= *ransonnetii*, Feld. & Rog.), p. 41, *Acontia flava*, Fabr. (= *Xanthodes trans-versa*, Guén.), figs. 2 & 2a, *interseptu*, Guén., fig. 3, p. 42, *Leocyma diane*, Guén. (= *Chasmira glabra*, Walk.), fig. 5, pl. cxlix. p. 43, *Brana calopasa*, pl. cxlviii. fig. 6, p. 44, *Rumadasa pavo*, Walk., pl. cxlix. fig. 1, p. 45, *Tarache tropica*, Guén., fig. 2, *signifera*, Walk. (= *subfixa*, Walk.), fig. 4, *olivea*, Guén., fig. 3, p. 47, *inda*, Feld. & Rog., fig. 5, *Bagada pyrochroma*, Walk., p. 48, *Hiccoda dosaroides*, Moore, fig. 16, *Naranga diffusa*, Walk., fig. 15, p. 49, *Churia maculata*, Moore, fig. 7, p. 50, *Heliothis armigera*, Hübn., figs. 1 & 1a, p. 51, *Adisura pallida*, Moore, fig. 8, p. 52, *Antho-phila derogata*, Walk., fig. 18, *divisa*, Moore, fig. 10, *hemirhoda*, Walk. (= *roseifascia*, Walk., and *Thalpochares adulans*, Feld. & Rog.), p. 53, *Hyela curvifera*, Walk., *lativitta*, Moore, fig. 9, pl. cl. p. 56, *Homodes crocea*, Guén. (= *vivida*, Guén.), fig. 11, p. 59, *Callopietria recurvata*, Moore, fig. 1, *exotica*, Guén., p. 60, *Penicillaria nugatrix*, Guén., *jocosatrix*, Guén., figs. 8 & 8a, p. 62, *Targalla infida*, Walk. (= *Penicillaria ludatrix*, Walk.), figs. 6 & 6a, *solida*, p. 63, *bifacies*, figs. 5 & 5a, *repleta*, Walk. (= *Eutelia impleta* and *plusioides* and *Eurkipia prætecta*, Feld.), p. 64, *resoluta*, p. 65, *Eutelia fuvillatrix* and *cinctipalpis*, p. 66, *Chlumetia transversa*, Walk. (= *guttiventris*, Walk.), fig. 3, pl. cli. p. 67, *Abrostola transfixa*, Walk., p. 69, *Plusia chrysitina*, Mart. (= *aurifera*, Hübn.), fig. 7, *verticillata*, Guén., fig. 6, *nigrituna*, Walk., figs. 2 & 2a, p. 70, *signata*, Fabr. (= *fur-cifera*, Walk.), fig. 4, *obtusisigna*, Walk., figs. 1 & 1a, p. 71, *limbirena*, fig. 5, pl. clii., *ochreatea*, Walk., pl. cli. fig. 4, *agramma*, Guén. (= *inchoata*, Walk.), pl. clii. figs. 3 & 3a, p. 72, *lectura*, Walk. (= *kalitura*, Feld. & Rog.), *dispellens*, p. 73, *impulsa* and *mutans*, Walk., p. 74, *Plusiodontu chalsytoides*, Guén. (= *Deva conducens*, Walk., and *Plusia agens*, Feld. & Rog.), *Birtha insulata*, Walk., p. 75, *Oresia emarginata*, Fabr. (= *alliciens* and *tentans*, Walk.), pl. clii. figs. 2 & 2a, p. 76, *Arsacia saturalis*, Walk., pl. clii. fig. 8, *Calpe minuticornis*, Guén., pl. clii. figs. 3 & 3a, p. 78, *Westermannia superba*, Hübn. (= *Plusiodes westermanni*, Guén.), fig. 1, p. 80, *Hyblea puera*, Cram. (= *Noctua saga*, Fabr., *N. unzia*, Hübn., and *Heliothis apricans*, Boisd.), figs. 2 & 2a, *constellata*, Guén., figs. 3 & 3a, p. 81, *Masseda mansueta*, Walk. (= *Calduba obtenta*, Walk.), figs. 4 & 5, pl. cli. p. 82, *Cosmophila xanthyndima*, Boisd. (= *indica*,

Guén., and *Cirrhædia variolosa* and *edentata*, Walk.), figs. 1 & 1a, b, p. 84, *Gonitis fulvida*, Guén. (= *fulvida* and *guttanivis*, Walk.), figs. 3 & 3a, pl. clv., *involuta*, Walk. (= *G. basalis* and *Tiridata colligata*, Walk.), fig. 7, p. 85, *mesogona*, Walk, fig. 8, pl. cliii., *Rusicada nigratarsis*, Walk. (= *albitibia*, Walk.), pl. clv. figs. 2 & 2a-d, p. 86, *iconica*, Walk., *Thalatta modesta*, fig. 5, *albiorbis*, fig. 6, pl. cliii. p. 87, and *Falana sordida*, Moore, pl. clv. fig. 4, p. 88.

Glottula dominicana, Cram., *Celæna canorufa*, Walk., fig. 11, *Prodenia retina*, Guén., *Perigia centralis*, Walk., fig. 11, *Heliothis armiger*, Hübn., *Plusia chrysitina*, Mart., figs. 13 & 13a, *Cosmophila indica*, Guén., *Homoptera solita*, figs. 9 & 9a, pl. xiv., *continua*, fig. 9, *Ercheia diversipennis*, Walk., *Selepa celis*, Moore, fig. 4, *curviferella*, fig. 8, pl. xv., *Tegna hyblælla*, Walk., pl. xiv. fig. 10, *Sphingomorpha chlorea*, Cram., pl. xv. figs. 7 & 7a, *Achæa melicerta*, Drury, *Ophiodes separans*, Walk., and *Remigia frugalis*, Fabr. Transformations described and in part figured; Forsyth, Tr. E. Soc. 1884, pp. 409-416.

H. Edwards & S. L. Elliot describe the larvæ of the following species (Papilio, iii. pp. 131-136):—*Acronycta grisea*, Walk., *occidentalis*, Grote & Rob., *lithospila*, Grote, *Agrotis c-nigrum*, Linn., *Mamestra renigera*, Steph., *Euplexia lucipara*, Linn., *Achatodes zææ*, Harr., *Scolecocampa liburna*, Geyer, *Lithophane laticinerea*, Grote, *Crambodes talidiformis*, Guén., *Ingura prepilata*, Grote, *Pyrrhia esprimens*, Walk., and *Parallelia bistriaris*, Hübn.

Agrotis hyperborea, Zett., var. *alpina*, Westw. (larva described), *A. xanthographa*, W. V., var. *festiva*, Hübn., var. *constua*, Treitschke, *cursoria*, Hufn., and varr. *sagitta* and *obscura*, Staud., *Dianthæcia nana*, Hufn., var., and *Hadena exilis*, Lef., from the Shetlands, discussed; Hoffmann, S. E. Z. xlv. pp. 359-365.

Rusicada diversalis, *Arthisma scissuralis*, and *Calpe bicolor*, Moore, figured by Waterhouse, Aid, iii. pl. cl. figs. 2-4.

Polenta, Morr., *Scolecocampa*, Guén., and *Eucalyptera*, Morr. Grote has mistaken the characters of the first genus; and the 2nd and 3rd, as differentiated, are shown to be perfectly distinct from each other: J. B. Smith, Canad. Ent. xv. pp. 229 & 230.

Catocala grynea, Cram., *ultronia*, Hübn., *Hydræcia sera*, Grote & Rob., and *Mamestra adjuncta*, Guén. Short notes on larvæ and pupæ; Bean, Canad. Ent. xvi. pp. 67 & 68.

Diaphona sylviana, Stoll (= *elegans*, Fabr., ♀ *eumelia*, Cram., and *Chelonia evidens*, Guér., is a true *Noctua*); Möschler, Verh. z.-b. Wien, xxxiii. p. 290.

Bryophila perla, Fabr., var. *pyreneæ* described and figured; Oberthür, Études d'Ent. viii. p. 48, pl. i. fig. 13.

Clidia chamæsyces, Guén. (= *geographica*, Fabr., var.). Larva noticed; Millière, Nat. Sicil. vii. pp. 15 & 16.

Acronycta leporina, Linn., and var. *bradyporina*, Treitschke, noticed; Dobree, Ent. xvii. p. 107. *A. lepusculina*, Guén.: larvæ and imago popularly described and figured; W. Saunders, Rep. E. Soc. Ont. 1883, pp. 24 & 25, figs. 5 & 6; Rep. Fruit-Growers' Ass. Ont. 1883, pp. 276 & 277, figs. 17 & 18. *A. lutea*, Brem., and *luteicoma*, Grote, var. *elongata* from

Sidemi noticed and figured; Oberthür, *op. cit.* x. pp. 18 & 20, pl. ii. figs. 14 & 3. *A. menyanthidis*, View.: aberration described and figured; Weymer, J.B. Ver. Elberfeld, vi. pp. 71 & 72, pl. ii. fig. 2. *A. psi*, Linn., sometimes double-brooded; Van Segvelt, C.R. ent. Belg. xxviii. p. cclxxx.: pupating in an empty cocoon of *Mania typica*, Linn.; Wattson, Ent. xvii. p. 253. *A. tridens*, W. V.: irregularity of appearance; Raynor, Ent. xvii. p. 39.

Arzama obliquata, Grote & Rob. Transformations noticed; Riley & Kellicott, Rep. E. Soc. Ont. 1883, pp. 18 & 20.

Leucania straminea, Treitschke (new to Scandinavia), recorded from Karlskrona; Thedenius, Ent. Tidskr. v. p. 100. *L. unipuncta*, Haw. (army-worm), discussed, and larva and imago figured; Riley, Encycl. Am. pp. 317 & 318, woodcuts: food-plants, *id.* Am. Nat. xviii. pp. 297 & 298: remarks, and larva and pupa figured; Forbes, Rep. Ins. Illin. xii. p. 102, fig. 22.

Nonagria. Structure of clypeus; Riley, Rep. E. Soc. Ont. 1883, p. 21. *N. fulva*, Hübn., noticed; Barrett, Ent. M. M. xxi. p. 111. *N. subcana*, Kellicott: ovipositor, and habits of larva noticed by him; Canad. Ent. xvi. pp. 170 & 171; Bull. Brooklyn Soc. vii. p. 86; Rep. E. Soc. Ont. 1883, pp. 20 & 21.

Tapinostola frumentalis, Lind. Lindeman's paper reprinted from Bull. Mosc.; Ent. Nachr. x. pp. 173-181.

Gortyna nitida, Guén., noticed, and larva and imago figured; Forbes, t. c. p. 103, fig. 23.

Hydrecia immanis, Guén. (injurious to hop). Life-history, ravages, and remedies discussed; Riley, Bull. Dep. Agric. Ent. U. S. iv. pp. 34-39, figs. 1-3 (showing injuries to the plant).

Charceas graminis, Linn. Life-history, variation, ravages, food-plants, &c., discussed; Holmgren, Ent. Tidskr. v. pp. 151-161 & 222-225. Abundant in Sweden in 1882; Schöyen, Ent. Tidskr. v. pp. 83 & 84. Assembling; Melvill, Ent. xvii. pp. 253 & 254.

Pachetra leucophæa, View., var. *pyrenaica*, described; Oberthür, *op. cit.* viii. p. 50.

Xylophasia polyodon, Linn., returning to the same resting-place after several days; Elliot, Ent. M. M. xx. p. 258.

Namestra budgeri, Feld. & Rog., fully described; Möschler, t. c. pp. 293 & 294. *M. picta*, Harr.: larva in various stages described; Packard, Am. Nat. xviii. pp. 1266 & 1267: feeding on pea; Horsford & Riley, Bull. Dep. Agric. Ent. U. S. iv. pp. 91 & 92; destroyed by *Ophion purgatus*, Say; Caulfield, Canad. Ent. xvi. pp. 122 & 123.

Apamea fibrosa, Hübn. Transformations described; Buckler, Ent. M. M. xx. pp. 176-178.

Perigea subaurea, Guén., noticed; Butler, Ann. N. H. (5) xiii. pp. 186 & 187.

Curadrina superstes, Treitschke. Life-history; Fuchs, S. F. Z. xlvi. pp. 261-264.

Agrotis candelisequa, Hübn., and *forcipula*, Borkh., var. *bornicensis*, Fuchs, discussed; *id.* t. c. pp. 260 & 261. *A. fennica*, Tausch., and other cut-worms: ravages, &c., discussed; Saunders, and Fletcher & Fyles. Canad.

Ent. xvi. pp. 204-207 & 214-216. *A. molothina*, Esp., and *collina*, Boisd.: transformations discussed; Standfuss, S. E. Z. xlv. pp. 201-205. *A. amica*, Treitschke: ravages of larva noticed; Forbes, t. c. p. 103. *A. conflua*, Treitschke: on rearing; Wocke, Z. E. Ver. schles. (2) ix. pp. 48-50. *A. fennica*, Tausch.: transformations described; Cook, Pract. Ent. pp. 3-5, figs. 1-4. *A. forcipula*, Hübn.: variety from Nuchur, and *spinosa*, Staud., noticed, and the latter figured; Christoph, in Romanoff's Mém. Lép. i. pp. 116 & 419, pl. vii. fig. 7. *A. obelisca*, Hübn.; injurious to vine in Alsace; Bellevoye, Bull. Soc. Ent. Fr. (6) iv. p. xcvii. *A. renigera*, Hübn.: variation noticed; Oberthür, op. cit. viii. pp. 48 & 49.

Noctua augur, Fabr. Abnormal emergence; Bouttell, Ent. xvii. p. 65. *Tentocampa opima*, Hübn.: on rearing; Walpole & Hall, Ent. xvii. pp. 43, 44, & 65-67. *T. stabilis*, View., found dead in pupa, its abdomen containing the pupa of a parasite; Griffith, Ent. M. M. xxi. p. 35.

Orrhodia fragariae, Esp. (*serotina*, Ochs.). Larva described, with notes on habits and rearing; it is not a cannibal, as some authors have stated: Stendel, JH. Ver. Württ. xl. pp. 46-50.

Scopelosoma morrisoni, *walkeri*, *vinulenta*, *tristigmata*, and *deria*, Grote. Transformations described; Thaxter, Canad. Ent. xvi. pp. 29-34.

Dabarita subtilis, Walk., redescribed and figured; Forsayeth, Tr. E. Soc. 1884, p. 408, pl. xiv. figs. 4 & 4a, b.

Cosmia. Larvæ discussed; Chrétien, Le Nat. vi. pp. 460, 461, 475-477, 484, & 485.

Epunda lutulenta, Borkh., and varr. noticed; Dobree & Russ, Ent. xvii. pp. 107 & 143.

Valeria oleagina, Fabr. On its alleged occurrence in England; Greene, Ent. xvii. pp. 129-131.

Polyphenis pulcherrima, Moore: var. from Manchuria noticed and figured; Oberthür, op. cit. x. p. 22, pl. ii. fig. 11.

Eurois virens, Butl., noticed and figured from Sidemi; id. t. c. p. 22, pl. ii. fig. 12.

Hadena bicoloria, Vill., ab. *rufuncula*, Haw., noticed as new to Scandinavia: Meves, Ent. Tidskr. v. pp. 96 & 206. *H. didyma*, Esp.: transformations noticed and larva figured; Milliére, Nat. Sicil. vii. p. 10, pl. i. fig. 6.

Erana graminosa, Walk. Larva described; Purdie, N. Z. J. Sci. ii. p. 163.

Calocampa vetusta, Hübn. Larva described; Baker, Ent. M. M. xxi. p. 13.

Cucullia. Various species often remain two years in pupa; Cambridge, Clifford, & Threlfall, Ent. xvii. pp. 143, 164, & 165. *C. artemisiae*, Hufn. (= *abrotani*, W. V.): larva noticed; Mabille, Bull. Soc. Ent. Fr. (6) iv. p. cxiv. *C. perforata*, Brem.: var. from Sidemi noticed and figured; Oberthür, t. c. p. 24, pl. iii. fig. 1. *C. scrophulariae*, W. V., and *verbasci*, Linn.: note on larvæ; Bignell, Ent. xvii. pp. 183 & 184.

Palpangula spilota, Ersch., and *henkei*, Staud., discussed and figured; Staudinger, Romanoff's Mém. Lép. i. pp. 150-152, pl. ix. figs. 8 & 9. *P. (Calophasia) christophi*, Ersch., noticed and figured; Christoph, t. c. p. 137, pl. viii. fig. 4.

Anarta melaleuca, Thunb. (?). Tr, *op. cit.* x. pp. 18 & 20, pl. ii. figs. 14
Ent. Tidskr. v. pp. 142 & 143. on described and figured; Weymer,

Agrophila trabealis, Scop. Variation l. ii. fig. 2. *Agrophila*, Tr. p. 150.

Xanthodes interrupta, Walk. (nec Guén.), = *transversa*, Guén.; Butler,
Ann. N. H. (5) xiii. p. 202.

Erastria scitula, Ramb. Larva described; it feeds on *Coccidæ*:
Millière, Rev. d'Ent. iii. pp. 1 & 2, pl. i. figs. 1-4 (transformations).

Bankia argentula, Hübn. Food-plant noticed; Goss, P. E. Soc. 1884,
p. xxxii.

Phothedes kisilkumensis and *secunda*, Ersch., noticed and figured;
Christoph, t. c. pp. 132 & 133, pl. viii. figs. 9 & 10.

Eriopus latreillii, Dup.: probable occurrence in Switzerland; Frey,
MT. schw. ent. Ges. vii. p. 19. *E. purpureofasciatus*, Pill.: protective
mimicry in larva; Lehmann, Z. E. Ver. schles. (2) ix. pp. 26 & 27.

Brephos parthenias, Linn., ab. *passetii* from Paris described; Thierry-
Mieg, Le Nat. vi. p. 437.

Plusia aurifera, Hübn., noticed from Portugal; Santos, J. Sci. Lisb. x.
pp. 126 & 127. *P. gamma*, Linn.: abundance in Ireland in 1883; De V.
Kane, Ent. M. M. xxi. p. 134. *P. pulchrina*, Haw., and *ain*, Hoch.,
noticed, and transformations of the latter described; Wocke, t. c.
pp. 51-53.

Plusiodonta compressipalpis, Guén. Note on transformations; Hoy,
Rep. E. Soc. Ont. 1883, p. 19.

Aletia argillacea, Hübn. Occurrence at Toronto and New York; H.
Edwards, Am. Nat. xviii. p. 77. Probably conveyed by rail; Reed, Canad.
Ent. xvi. p. 220.

Spintherops gracilis, Staud., noticed and figured; Christoph, t. c. p. 138,
pl. viii. fig. 11. *S. spectrum*, Esp.: note on larva; Frey, MT. schw. ent.
Ges. vii. p. 19.

Catocala. Tufts of ♂ described, and those of *C. fraxini*, Linn.,
figured; Haase, Z. E. Ver. schles. (2) ix. pp. 16-19, fig. ii. Angus main-
tains that *C. angusi*, Grote (of which 3 varieties are described), and
residua, Grote, are distinct from *insolabilis*, Guén., and *C. whitneyi*,
Dodge, and *abbreviatella*, Grote, from *nuptialis*, Walsh.; Papilio, iv.
pp. 35-37. *C. adultera*, Mén., = *unijuga*, Walk.; *C. lara*, Brem., is pro-
bably a white variety of *cerogama*; Oberthür, Bull. Soc. Ent. Fr. (6) iii.
p. lxxxvi. *C. amatrrix*, Hübn., and *ilia*, Cram.: preparatory stages
described; French, Canad. Ent. xvi. pp. 8-15. *C. nupta*, Linn.: variety
described and figured; Snellen, Tijdschr. Ent. xxvii. pp. lxxxiii-lxxxv.
& 209, pl. xi. fig. 1. *C. pherpera*, Giorna, var. *rosea* from Morocco
described; Austaut, Le Nat. viii. p. 391. *C. walshii*, W. H. Edwards,
and allies noticed; Strecker, Papilio, iv. pp. 73-75.

Bendis poaphiloides, Guén. (= *Zethes umbrata* and *Ephyrodes postica*,
Walk.), noticed; Druce, P. Z. S. 1884, p. 323.

Pseudophia lunaris, W. V., abb. *rufa*, *murina*, and *maura*, from Algeria,
described and figured; Oberthür, Études d'Ent. ix. pp. 39 & 40, pl. iii.
figs. 11-13.

Drasteria erechtea, Cram. Transformations described; French, Papilio,
iv. pp. 148 & 149.

Ent. xvi. pp. 204-207 & 214-216. *A. dissimulans*, Walk., are synonyms; transformations discussed; Standf. (= *Chalciope lycopodia*, Hübn.), noticed from Caroline Island; Butler, Mem. Nat. Ac. Sci., Rep. Eclipse Exped. p. 95.

Azeta mirzah, Guén. (= *Thermesia fastidiosa*, *Thyridospila suffusa*, and *Chabora undulifera*, Walk.), noticed; Druce, t. c. p. 324.

Capnodes macrocera, Snell. Var. *amboinica* noticed; Pagenstecher, JB. nass. Ver. xxxvii. p. 242.

New genera and species:—

Aramuna, Moore, Lep. Ceyl. iii. p. 35. *Orthosiidæ*. Type, *A. marginata*, sp. n., t. c. p. 36, pl. cxlix. fig. 6, Ceylon.

Caradana, id. t. c. p. 45. *Acontiidæ*. Type, *Acontia fasciculosa*, Walk. *Pitacota*, id. t. c. p. 46. Placed next to last. Type, *Felinia terminigera*, Walk. (redescribed and figured, *ibid.* pl. cxlix. fig. 7).

Armada, Staudinger, in Romanoff's Mém. Lép. i. p. 145. New section of *Acontia*. To include *A. dentata* and *clio*, spp. nn., t. c. pp. 142 & 145, Askhabad (will also include *A. hueberi*, Ersch., and *Leucanitis panaceorum*, Mén.).

Maurilia, Möschler, Verh. z.-b. Wien, xxxiii. p. 298. Affinities doubtful; placed provisionally after *Acontia*. Type, *M. lubina*, sp. n., *ibid.* pl. xvi. fig. 13, Caffraria.

Paracrama, Moore, t. c. p. 54. Placed after *Eublemma*. Type, *Nolusena dulcissima*, Walk. (redescribed and figured, t. c. p. 55, pl. cl. fig. 1).

Maradana, id. t. c. p. 57. Placed after *Odice*. Type, *M. rivulata*, sp. n., t. c. p. 58, pl. cl. fig. 14, Ceylon.

Epistona, Möschler, t. c. p. 302. Allied to *Ædia*. Type, *E. limula*, sp. n., t. c. p. 303, pl. xvi. fig. 17, Caffraria.

Alura, id. t. c. p. 303. Allied to *Epistona*. Type, *A. caupona*, sp. n., t. c. p. 304, pl. xvi. fig. 18, Caffraria.

Catabapta, Hulst, Bull. Brooklyn Soc. vii. p. 49. New section of *Catocala*. To include *Phalena paranympa*, Dru., *vidua*, Abb. & Smith, and allied species.

Bryophila impar, Warren, Ent. M. M. xxi. p. 22, Cambridge, Cork.

Charadra nigracreta, H. Edwards, Papilio, iv. p. 17, Mexico.

Diphtera latevirens, Oberthür, Études d'Ent. x. p. 17, pl. ii. fig. 6, Sidemi.

Acronycta michael and *raphael*, id. t. c. pp. 18 & 19, pl. ii. figs. 13 & 9, Sidemi; *A. betula*, Riley, Bull. Brooklyn Soc. vii. p. 2, Washington.

Hyboma fasciata, Moore, Lep. Ceyl. iii. p. 5, pl. cxliv. fig. 4, Ceylon.

Aletia reversa, id. t. c. p. 6, pl. cxliv. fig. 5, Ceylon.

Leucania internata, *melianoides*, p. 291, and *baziya*, p. 292, Möschler, Verh. z.-b. Wien, xxxiii. pl. xvi. figs. 3-5, Caffraria.

Senta cecimboides, Moore, t. c. p. 12, pl. cxlv. fig. 6, Ceylon.

Chasmina atrata, Butler, Ann. N. H. (5) xiii. p. 274, Yesso.

Prodenia evanescens (? albinism of *retina*, Herr.-Schäff.), id. Mem. Nat. Ac. Sci., Rep. Eclipse Exped. p. 94, Caroline Island.

Episema antherici, Christoph, in Romanoff's Mém. Lép. i. p. 121, pl. viii. figs. 2a & b (imago and larva), Askhabad.

- Luperina messaouda*, Oberthür, *op. cit.* x. pp. 18 & 20, pl. ii. figs. 14
Mamestra albipicta, Christoph, *t. c.* onl. ii. fig. 2. ~~Arizona.~~
Perigea benigna, *continens*, p. 122, and *dilecta*, p. 123, H. Edwards, *t. c.*,
 Arizona.
- Caradrina singula* and *orbata*, Möschler, *t. c.* pp. 292 & 293, pl. xvi.
 figs. 6 & 7, Caffraria.
- Agrotis devota*, Askhabad, and *contrita*, Nuebur, Christoph, *t. c.* pp. 116
 & 118, pl. vii. figs. 6 & 8.
- Triphana jankowskii*, Oberthür, *op. cit.* x. p. 20, pl. ii. fig. 10, Sidemi.
- Thalpophila delineata*, Moore, *t. c.* p. 25, pl. cxlvi. fig. 5, Ceylon.
- Radinacra placida*, fig. 4, *renalis*, fig. 4a, pl. cxlvii. p. 30, and *thoracica*,
 pl. cxlviii. fig. 4, p. 31, *id. t. c.*, Ceylon.
- Graphiphora frontalis*, *id. t. c.* p. 35, pl. cxlviii. fig. 3, Ceylon.
- Segetia variegata*, Oberthür, *t. c.* p. 21, pl. ii. fig. 1, Sidemi, Ussuri.
- [*Agrotis*, or] *Polia vorax*, Behrens & Smith, *Papilio*, iv. pp. 21 & 114,
 San Francisco.
- Dianthæcia submæsta*, Möschler, *t. c.* p. 294, pl. xvi. fig. 8, Caffraria.
- Metopoceras khalildja*, Oberthür, *op. cit.* ix. p. 38, pl. iii. fig. 1, Algeria.
- Hadena transfrons*, Colorado, and *smaragdina*, Arizona, Neumoegen,
Papilio, iii. pp. 139 & 140; *H. viridis* and *metallica*, H. Edwards, *t. c.*
 p. 117, Mexico.
- Pseudanarta falcata*, Neumoegen, *t. c.* p. 141, Arizona.
- Nystalea indiana*, Grote, *Papilio*, iv. p. 7, Florida.
- Scotochrosta* (?) *distincta*, pl. viii. fig. 3, and *S. (?) fissilis*, Christoph,
t. c. pp. 124 & 125, Akhal-Tekhe district.
- Cucullia jankowskii* and *mandschurica*, Oberthür, *op. cit.* x. p. 23, pl. iii.
 figs. 2 & 4, Sidemi; *C. ditissima*, *id.* Bull. Soc. Ent. Fr. (6) iii. p. lxxxvi.,
 Manchuria; *C. minuta* and *pusilla*, Möschler, *t. c.* pp. 295 & 296, pl. xvi.
 figs. 9 & 10, Caffraria.
- Pulpangula cestina*, Staudinger, in Romanoff's *Mém. Léop.* i. p. 149,
 pl. ix. fig. 7, Askhabad.
- Tamila arefacta*, H. Edwards, *t. c.* p. 123, Florida.
- Schinia (Porrima) carmosina*, Neumoegen, *t. c.* p. 142, Florida.
- Heliothis violacea*, Pagenstecher, *J.B. nass. Ver.* xxxvii. p. 223, Amboina;
A. suavis, H. Edwards, *t. c.* p. 45, New Mexico.
- Anthracia petulans*, *id. t. c.* p. 123, Florida.
- Meliclectria septentrionalis*, Hudson's Bay, and *exalta*, Texas, *id. t. c.*
 pp. 45 & 124.
- Eugraphia jankowskii*, Oberthür, *t. c.* p. 25, pl. iii. fig. 8, Sidemi.
- Acontia dignata*, Möschler, *t. c.* p. 297, pl. xvi. fig. 12, Caffraria; *A.*
eylandti, Christoph, *t. c.* p. 128, pl. viii. fig. 5, Askhabad; *A. imitata*,
 Moore, *t. c.* p. 42, pl. cxlix. fig. 4, Ceylon.
- Tarache destituta* (Walk., MS.), *id. t. c.* p. 48, pl. cl. fig. 6, Ceylon.
- Erastria sidemiata* and *versicolor*, Oberthür, *t. c.* p. 25, pl. iii. figs. 6
 & 7, Sidemi.
- Fruva modesta*, Nevada, and *deleta*, Nevada, Hudson's Bay, H. Ed-
 wards, *t. c.* p. 124.
- Phothedes erschoffi* and *lunata*, Christoph, *t. c.* pp. 133 & 135, pl. viii.
 figs. 8 & 7, Askhabad.

- Ent. xvi. pp. 204-207 & 214-216. *A. Christoph*, t. c. pp. 129 & 131, pl. viii. transformations discussed; Standf. 54, pl. cl. fig. 12, Ceylon.
- Phyllophila modesta*, *cf. r. cf. l.* 55, pl. cl. fig. 13, Ceylon.
- Odice transversa*, id. t. c. p. 57, pl. cl. fig. 15, Ceylon.
- Methorasa thwaitesii*, id. t. c. p. 61, pl. cli. fig. 2, Ceylon.
- Eriopus reticulata*, Pagenstecher, t. c. p. 226, pl. vi. fig. 7, Amboina.
- Varnia taprobana*, Moore, t. c. p. 67, pl. cli. fig. 7, Ceylon.
- Chlumetia egens* (Walk., MS.), id. t. c. p. 68, pl. cli. fig. 9, Ceylon.
- Plusia calberlae*, Standfuss, S. E. Z. xlv. p. 199, Italy (transformations described, and differentiated from those of *P. beckeri*, Staud. ; but Staudinger declares, S. E. Z. xlv. pp. 300-302, that the insect = his *P. beckeri* var. *italica*, and is not specifically distinct); *P. leonina*, fig. 11, Sidemi, p. 26, *bieti*, Thibet, *sergia*, fig. 9, *obscura*, fig. 13, and *v-minus*, fig. 12, Sidemi, Oberthür, t. c. pl. iii.; *P. melanocephala*, Möschler, t. c. p. 297, pl. xvi. fig. 11, Caffraria; *P. placida*, Moore, t. c. p. 73, pl. cli. fig. 10, Ceylon; *P. snowii*, H. Edwards, t. c. p. 44, New Mexico.
- Basilodes territans*, id. t. c. p. 45; *B. mirabilis*, Neumoegen, op. cit. iv. p. 94, both from Arizona.
- Plusiodonta effulgens*, H. Edwards, t. c. p. 79, Mexico.
- Oræsia argyrosigna*, Moore, t. c. p. 77, pl. cliii. fig. 4, Ceylon; *O. hirtmanni*, Möschler, t. c. p. 299, pl. xvi. fig. 14, Caffraria.
- Anomis luperca*, id. t. c. p. 300, pl. xvi. fig. 15, Caffraria.
- Amphipyra jankowskii*, Sidemi, and *largeteaui*, Kouy-Tcheou, Oberthür, t. c. pp. 27 & 28, pl. ii. figs. 8 & 7.
- Dichagyris jankowskii*, id. op. cit. viii. p. 28, pl. iii. fig. 5, Sidemi.
- Synedoida aegrotæ*, H. Edwards, t. c. p. 47, Arizona.
- Pandesma tempica*, Möschler, t. c. p. 300, pl. xvi. fig. 16, Caffraria.
- Alamis caffraria*, id. t. c. p. 301, Caffraria; *A. rufescens* and *holzi*, Pagenstecher, t. c. pp. 228 & 229, pl. vi. figs. 11 & 4, Amboina.
- Gerbathu pseudodryops*, Butler, Ann. N. H. (5) xiii. p. 274, Yesso.
- Cocytodes odilia*, Oberthür, Bull. Soc. Ent. Fr. (6) iv. p. xci., Haiti.
- Stibadium curiosum*, Neumoegen, op. cit. iii. p. 141, Arizona.
- Stiria nanata*, id. op. cit. iv. p. 95, New Mexico.
- Acopa pacifica*, H. Edwards, t. c. p. 46, Arizona.
- Leucanitis sinuosa* and *L. (?) nana*, Staudinger, t. c. pp. 146 & 147, pl. ix. figs. 5 & 6, Askabad; *L. beckeri*, Standfuss, t. c. p. 272, Sarepta.
- Syneda athabasca*, Neumoegen, t. c. p. 143, Colorado; *S. perfecta* and *perplexa*, H. Edwards, t. c. pp. 46 & 47, Arizona.
- Catocala sancta* (= *connubialis*, Guén. (?), and *amasia*, Streck., nec Abb. & Smith), Eastern States, *blandula* (= *polygama*, Grote, nec Guén.), United States, p. 38, *verecunda*, Montana, *allusa*, Washington Territory, p. 45, *luctuosa*, United States, p. 53, Hulst, Bull. Brooklyn Soc. vii.; *C. dionysa*, Arizona, p. 124, *phæbe*, New Hampshire, and *hero*, Florida, p. 125, H. Edwards, t. c.; *C. babayaga*, Streck., Papilio, iv. p. 73, Arizona.
- Potamophora schlegelii*, Snellen, Notes Leyd. Mus. vi. p. 87, Amboina.
- Oxyodes ochracea*, Pagenstecher, t. c. p. 231, Amboina.
- Spiramia funestis*, Butler, Ann. N. H. (5) xiii. p. 202, Amboina.
- Ophiodes minians*, Mabille, C.R. ent. Belg. xxviii. p. exc., Madagascar.

Ophisma leucochiton, *id. ibid.*, transformations noticed; Sandberg, and *exuleata*, p. 306, Möschler, *t. c.* pl. Pagenstecher, *t. c.* p. 235, pl. vii. fig.

Drasteria magnifica, H. Edwards, *t. c.* p. 143, Colorado. noticed; Christy; *D. distincta*, Neumoege, *t. c.* p. 143, Colorado.

Euclidia remigina, Mabilie, *t. c.* p. cxc., Madagascar.

Zethes leitimorensis, pl. vi. fig. 10, and *olivacea*, Pagenstecher, *t. c.* pp. 238 & 239, Amboina.

Focilla elegans, *id. t. c.* p. 239, pl. vi. fig. 8, Amboina.

Hypospila (?) *iridicolor*, *id. t. c.* p. 241, Amboina.

DELTOIDIDÆ.

Helia americalis, Guén.: habits of larva noticed; Riley, Rep. E. Soc. Ont. 1883, p. 18. *H. lubricalis*, Gey., var. *occidentalis* from California and Vancouver described; J. B. Smith, Bull. Brooklyn Soc. vii. p. 5.

Hyphenia baltimoralis, Guén.: occurrence in January, flying over and settling on the ice; Aaron, Papilio, iv. p. 112. *H. hunnelli*, Harr.: transformations briefly described; Riley, Bull. Dep. Agric. Ent. U. S. iv. p. 39. *H. obsitalis*, Hübn., recorded as new to Britain, and figured; Cambridge & Carrington, Ent. xvii. pp. 265 & 266.

New species :—

Heterogramma nasonialis, Pagenstecher, JB. nass. Ver. xxxvii. p. 248, pl. vi. fig. 9, Amboina; *H. palligera*, J. B. Smith, Bull. Brooklyn Soc. vii. p. 6, California, Florida.

Helia borealis, *id. t. c.* p. 5, United States.

Zanclognatha obsoleta, *id. ibid.*, Vermont; *Z. cafferaria*, Möschler, Verh. z.-b. Wien, xxxiii. p. 307, pl. xvi. fig. 22, Caffraria.

Madopa lutealis and *dilutalis*, Snellen, Tijdschr. Ent. xxvii. pp. 213 & 215, pl. xi. figs. 4, 4a, 5, & 5a, Java.

Bomolocha umbralis, J. B. Smith, *t. c.* p. 4, Florida.

Hyphenia decorata, *id. ibid.*, California, Vancouver; *H. inclyta*, H. Edwards, Papilio, iv. p. 80, Mexico; *H. albifascialis*, Pagenstecher, *t. c.* p. 244, pl. vii. fig. 5, Amboina.

Simplicia albidorsalis, *id. t. c.* p. 246, Amboina.

GEOMETRIDÆ.

BOHATSCH, O. Die Eupitheciën Oesterreich-Ungarns. ii. Nachtrag. Wien. ent. Z. iii. pp. 294-298.

Short notes on various species; the most important relate to *E. abietaria*, Goeze (differentiated from *togata*, Hübn.), *innotata*, Hufn. (of which *fraxinata*, Crewe, is probably a dimorphic or seasonal form), and *chloerata*, Mab. (recorded as new to Vienna, and differentiated from its allies).

MEYRICK, E. A Monograph of the New Zealand *Geometridæ*. Tr. N. Z. Inst. xvi. pp. 49-113.

An abstract of this paper was published in N. Z. J. Sci. i. pp. 526-531,

and was fully noticed in Zool. Rec. xx. pp. 211 and foll. 41 genera and 90 species are now described in full.

PURDIE, A. New Zealand Larentidæ. N. Z. J. Sci. ii. pp. 45-48, 64, & 65.

Copied descriptions of known species, with occasional remarks.

Lygris testata, Linn., *Cidaria* (several species), and *Eupithecia venosata*, Fabr., var., and *E. (?) nanata*, Hübn., var., noticed from the Shetlands; Hoffmann, S. E. Z. xlv. pp. 366-371.

Larentia brumata and *Hybernia defoliaria*, Linn., discussed, with special reference to their ravages and parasites; Bull. Insect. Agric. ix. pp. 42-45 & 55-58, figs. 4-6.

Thierry-Mieg, Le Nat. vi. p. 437, describes *Numeria pulveraria*, W. V., ab. *passetii*, *Hybernia leucophæaria*, Linn., ab. *funeraria*, from N. Europe, *Bupalus piniarius*, Linn., ab. *tristis*, from the Simplon, and *Ortholitha limitata*, Scop., ab. *unicolor*, from S. France.

Acidalia contiguaria, Hübn., ab. *fuscalata*, Fuchs, *virgularia*, Hübn., ab. *bischoffiaria*, Hübn., *Zonosoma porata*, Fabr., and var. *visperaria*, Fuchs, *Boarmia gemmaria*, Brahm, and var. *minor*, Fuchs, *roboraria*, W. V., ab. *infusata*, Staud., *Ematurga atomaria*, Linn., *Minoa euphorbiata*, Linn. (= *muricata*, Scop.), and *Cidaria pomæriaria*, Eversm., and var. *æstiva*, Fuchs, noticed from the Rheingau; Fuchs, S. E. Z. xlv. pp. 264-270.

On variation in the *Geometridæ*, with special reference to a brood of *Cidaria sociata*, Borkh.; Sintenis, SB. Ges. Dorp. vii. pp. 124-129, plate.

Hybernia leucophæaria, W. V., ab. *merularia*, and *Biston stratararius*, Hübn., ab. *terrarius*, described and figured; Weymer, JB. Ver. Elberfeld, vi. pp. 72 & 73, pl. i. figs. 4 & 3.

Eugonia fuscantaria, Haw., and *Boarmia consonaria*, Hübn., recorded as new to the fauna of Dorpat; Knüpfner, SB. Ges. Dorp. vi. pp. 589 & 590.

List of *Geometridæ* captured at Orono, Maine, and vicinity; [Mrs.] C. H. Fernald, Canad. Ent. xvi. pp. 129 & 130.

Endropia textrina, Grote & Rob., *Paraphia deplanaria*, Guén., *Tetracis lorata*, Grote, *Metanema quercivoraria*, Guén., and *Caripeta angustiorata*, Walk. *Transformations described; Packard, Am. Nat. xviii. pp. 934-936, 1045, & 1046.

Lagyrta megaspila, *Anisodes semilaria*, *pallivittata*, *Geometra dentisignata* and *vittata*, and *Cimicodes cruentaria*, Moore, figured by Waterhouse, Aid, iii. pl. cli. figs. 1-6.

Spine of a *Geometra* larva from S. Africa noticed and figured; Bairstow, Naturalist (2) ix. p. 131, note, pl. viii. fig. 3.

Descriptions of larvæ of New Zealand *Geometridæ*, and list of *Geometridæ* captured near Dunedin, with notes on times of appearance; Purdie, N. Z. J. Sci. ii. pp. 116-118 & 160-166.

Meyrick, N. Z. J. Sci. ii. pp. 234 & 235, publishes the following additional synonymy of New Zealand *Geometridæ*:—*Acidalia rubraria*, Doubl. (= *repletaria* and *attributa*, Walk.), *Eurydice rufescens*, Butl. (= *cynosema*, Meyr.), *Stratonice euclidiata*, Guén. (= *glyphicata*, Guén., and

catapyrrha, Butl.), *Pasiphila bilineolata* (= *inductata*, *denotata*, *subitata*, *humeralata*, *eupitheciata*, *parvulata*, and *cristata*, Walk.), *Tatosoma agrionata*, Walk. (= *tipulata*, *inclinataria*, *transitaria*, *collectaria*, Walk., and *mistata*, Feld.), *Arsinoe subochraria*, Doubt. (= *tuboliaria*, Walk.), *Cidaria arida*, Butl. (= *chaotica*, Meyr., *Larentia lucidata*, Walk. (= *plurimata*, *venipunctata*, Walk., and *psamathodes*, Meyr.), *subobscurata*, Walk. (= *petropola*, Meyr.), *cinerearia*, Doubl. (= *diffusaria*, Walk.), *Statira enysi*, Butl. (= *homomorpha*, Meyr., nec *Pasithea brephos*, Walk.); *Somana*, Walk., is not = *Panagra*, Guén.; *Pseudocoremia melinata*, Feld. (= *confusa*, Butl.), *Declana junctilinea*, Walk. (= *verrucosa*, Feld.), *Ipana leptomera*, Walk. (= *crassitibia*, Feld.), *Amastris humeralia*, Walk. (= *obtusaria*, *flexata*, *obtruncata*, *fusiplayiata*, Walk., and *encausta*, Meyr.), *Chalastra pelurgata*, Walk. (= *cinerascens*, Feld., and *streptophora*, Meyr.), *Larentia quadristrigata*, Walk. (= *interclusa*, Walk.).

Cidaria chaotica and *Stratocleis streptophora*, Meyr., = *Melanthia arida*, Butl., and *Itama* (?) *cinerascens*, Feld.; the last species is distinct from *Harpalyce humeralia*, Walk., and is described: Purdie, N. Z. J. Sci. ii. pp. 88 & 89.

Mergana and *Auxima*, Walk., = *Sarcinodes*, Guén.; Rosenstock, Ann. N. H. (5) xiv. p. 64.

Epione advenaria, Hübn. Early appearance; Rendall, Ent. xvii. p. 92.

Metrocampa admirabilis, Oberthür, redescribed and figured by him; Etudes d'Ent. x. p. 29, pl. i. fig. 8.

Ellopiia capreolaria, Fabr. Larva described; the species is erroneously referred by authors to *Numeria*: Millière, Nat. Sicil. vii. p. 13.

Tetraxis lorata, Grote, mimicking part of a flower; [Miss] C. M. West, Canad. Ent. xvi. p. 89.

Pericallia syringaria, Linn. Occurrence near Stockholm; Wermelin, Ent. Tidskr. v. p. 190 & 227.

Crocallis auberti, Oberthür, redescribed and figured by him; *op. cit.* ix. p. 40, pl. iii. fig. 2. *C. dardouinaria*, Donz.: eggs described; 321 laid by one ♀: Millière, Rev. d'Ent. iii. p. 5.

Ennomos angularia, Borkh.: variety noticed; Bignell, Ent. M. M. xxi. p. 22. *E. autumnaria*, Wernb. (= *alniaria*, W. V.): green variety of larva; Webb, Ent. M. M. xxi. p. 160.

Biston lapponarius, Boisd. On rearing; Wocke, Z. E. Ver. schles. (2) ix. pp. 54 & 55. Adult larva described; Teich, S. E. Z. xlv. p. 213.

Amphidasis cognataria, Guén. Larva described; H. Edwards & S. L. Elliot, Papilio, iii. p. 136.

Nychiodes lividaria, Hübn., var. *ragusaria* from Palermo described and figured; Millière, Nat. Sicil. iii. p. 196, pl. iii. fig. 1 (*cf.* also Bellier de la Chavignerie, Nat. Sicil. iii. p. 297). Var. *andalusaria*, Mill., noticed; Ragusa, Nat. Sicil. iv. p. 32.

Bourmia dembowskii, Oberthür. Var. from Sidemi noticed and figured by him; *op. cit.* x. p. 32, pl. i. fig. 11.

Hypochroma dispensata, Walk. Transformations described and figured; Forsayeth, Tr. E. Soc. 1884, p. 416, pl. xiv. figs. 12 & 12a.

Gnophos serotinaris, W. V.: transformations described; Rogenhofer,

Verh. z.-b. Wien, xxxiv. pp. 157 & 158. *G. sordaria* var. *mendicaria*, Herr.-Schäff.: life-history; Hoffmann, S. E. Z. xlv. pp. 315-318.

- *Psodos alpinata*, W. V., var. *pyrenæa* from the Pyrenees described; Oberthür, *op. cit.* viii. p. 42.

Pygmaea fusca, Thunb. Transformations noticed; Sandberg, Ent. Tidskr. v. pp. 143 & 144.

Boletobia fuliginaria, Linn., discussed, and larva described; Tugwell, Ent. xvii. pp. 153-155 & 183.

Geometra iridaria, Guén., var. *consequaria* from Georgia, Florida, and Mexico described; H. Edwards, Papilio, iv. p. 19. *G. smaragdaria*, Fabr.: larva noticed; Elisha, Ent. xvii. p. 235.

Nemoria viridata, Linn., and *porrinata*, Zell. Note on food-plants; Frey, MT. schw. ent. Ges. vii. p. 20.

Acidalia contiguaria, Hübn., noticed; Mabilie, Bull. Soc. Ent. Fr. (6) iv. p. cxiv. *A. helianthemata*, Millière: variation discussed by him; Rev. d'Ent. iii. pp. 4 & 5. *A. punctata*, Treitschke: transformations described; Habich, Wien. ent. Z. iii. pp. 246 & 247. *A. strigillaria*, Hübn., and *fumata*, Steph.: eggs described; Shuttleworth, Ent. xvii. pp. 5 & 6.

Stegania dilectaria, Hübn. Transformations described; Habich, *t. c.* p. 245.

Fidonia rosaria, Fabr. Variation; Wocke, *t. c.* p. 55.

Lythria sanguinaria, Boisd. Transformations noticed and larva figured; Millière, Nat. Sicil. vii. p. 7, pl. i. figs. 1 & 2.

Pantherodes pardalaria, Hübn., noticed; F. Müller, P. E. Soc. 1884, p. xxiv.

Zerene catenaria, Guén. (injurious to cranberry). Transformations briefly described; Riley, Bull. Dep. Agric. Ent. U. S. iv. p. 31.

Selidosema erebaria, Oberthür, redescribed and figured by him; *op. cit.* ix. p. 40, pl. iii. fig. 15.

Abraxas grossulariata, Linn.: varieties noticed; Gee, Ent. xvii. p. 22; Oudemans, Tijdschr. Ent. xxvii. p. xvi. *A. pantaria*, Linn., noticed; Lichtenstein & Ragonot, Bull. Soc. Ent. Fr. (6) iv. pp. xcii. & cvii.

Hazis malayaria, Guén., is distinct from *malayanus*, Guér., and possibly = *palmyra*, Stoll; it may be provisionally named *doubledayi*: Snellen, Tijdschr. Ent. xxvii. pp. lxxxiii. & 96-98.

Hybernina progenimaria, Hübn.: var. *fusca* noticed; Harrison, Ent. xvi. p. 111. *H. tiliaria*, Harr., noticed, and sexes and larva figured; W. Saunders, Rep. Fruit-Growers' Ass. Ont. 1882, pp. 275 & 276, fig. 16, and Rep. E. Soc. Ont. 1883, p. 25, fig. 7.

Larentia flavicinctata, Hübn., var. *caruleata*, Guén., figs. 1-3, and *turbata*, Hübn., var. *pyrenearia*, Oberth., figs. 5 & 6, described and figured from the Pyrenees; Oberthür, *op. cit.* viii. pp. 43-45, pl. i. *L. flavicinctata*: larva described; Millière, Nat. Sicil. iv. p. 14.

Glancopteryx cunatilis, Grote & Rob., and *magnoliata*, Guén., noticed; Moffat, Canad. Ent. xvi. pp. 38 & 39.

Eupithecia. Unknown larva described; Hellins, Ent. M. M. xxi. pp. 136 & 137. Abstract of Speyer's paper (S. E. Z. xlv. pp. 333-356; cf. Zool. Rec. xx. Ins. p. 155), with additional remarks; Ent.

Nachr. x. pp. 32-41. *E. togata*, Hübn., noticed; Elliot, Ent. M. M. xxi. p. 88.

Coremia ferrugata, Clerck, noticed; Oberthür, *op. cit.* viii. p. 47.

Cidaria capitata, Herr.-Schäff., and *cyanata*, Hübn., noticed as new to Hungary; Pavel, Rov. Lapok, i. pp. 209, 210, & xxvii. (cf. also Vängel, Rev. Lapok, i. pp. 234 & xxix.). *C. dilutata*, W. V.: abundance in Sweden in 1882; transformations, &c., noticed; Schöyen & Andersson, Ent. Tidskr. v. pp. 84-86, 187, & 188. *C. hastata*, Linn., var. *hastulata*, Hübn.: transformations noticed; Sandberg, *t. c.* p. 143. *C. minorata*, Treitschke, and *unifusciata*, Haw., recorded as new to Sweden; Lampa, Ent. Tidskr. v. pp. 70, 93, 96, & 206. *C. vittata*, Borkh., fig. 3, *luctuata*, Hübn., figs. 4 & 5; and *capitata*, Herr.-Schäff., fig. 7: transformations noticed and larvæ described; Millière, *t. c.* pp. 8, 9, & 11, pl. i.

Eubolia palumbaria, W. V., varr. from the Pyrenees noticed; Oberthür, *t. c.* p. 47.

Odezia tibialis, Esp. Note on larva; Habich, *t. c.* pp. 245 & 246.

New genera and species :—

Snowia, Neumoegen, Papilio, iv. p. 95. Intermediate between *Ellopia* and *Cuberodes*. Type, *S. montanaria*, sp. n., *t. c.* p. 96, New Mexico.

Jankowskia, Oberthür, Études d'Ent. ix. p. 25. *Boarmidæ*: thorax and abdomen rather stout; wings longer than the hind wings; antennæ of ♂ pectinated, rather short, and terminating in a ciliated point; wings slightly recurved at the tip. To include *J. athleta* and *thoracilaria*, spp. nn., *t. c.* pp. 25 & 26, pl. ii. figs. 7 & 8, Manchuria.

Gellonia, Meyrick (= *Boarmia*, Meyr., nec Tr., and *Barsine*, Meyr., nec Walk.), N. Z. J. Sci. ii. p. 234 (Sept.); also named *Meyrickia* by Butler, Ent. M. M. xxi. p. 123 (Nov.).

Euchera fabiolaria, Oberthür, Études d'Ent. x. p. 35, pl. iii. fig. 3, Kouy-Tcheou.

Drepanodes vehemensaria, H. Edwards, Papilio, iv. p. 19, Mexico.

Metrocampa (?) *admirabilis*, Oberthür, Bull. Soc. Ent. Fr. (6) iii. p. lxxxiv., Manchuria.

Tetracis indiscretata, H. Edwards, *t. c.* p. 48, New Mexico.

Antepione imitata, *id. ibid.*, New Mexico.

Sphacelodes floridensis, Holland, Papilio, iv. p. 72, Florida.

Lubedera staudingeri, Heylaerts, C.R. ent. Belg. xxviii. p. xcv., Bogota.

Chondrosoma arcanaria, Millière, Rev. d'Ent. iii. p. 6, pl. i. fig. 5, Algeria (?).

Hemerophila dejeani, Oberthür, Études d'Ent. x. p. 30, pl. i. fig. 12, Thibet.

Nychiodes bellieraria, Ragusa, Nat. Sicil. iii. p. 352, pl. iii. fig. 2, Sicily.

Boarmia maturnaria, Möscher, Verh. z.-b. Wien, xxxiii. p. 307, pl. xvi. fig. 23, Caffraria; *B. elegans*, Oberthür, *t. c.* p. 31, pl. i. fig. 4, Alaska; *B. lutea*, Pagenstecher, JB. nass. Ver. xxxvii. p. 252, pl. vii. fig. 4, Amboina.

Tephrosia excellens, Butler, Ann. N. H. (5) xiii. p. 275, Yesso.

Gnophos thibetaria, Oberthür, *op. cit.* ix. p. 21, pl. i. fig. 3, Thibet.

- Aplodes coniferaria*, Packard, Am. Nat. xviii. p. 933, United States.
Calledapteryx opinaterata, H. Edwards, t. c. p. 18, Mexico.
Mecoceras schausaria, id. *ibid.*, Mexico.
~~*multitenealis*, Guenée, t. c. p. 18, Mexico.~~
Deuterarcha, id. t. c. p. 18, Mexico.
xanthomela and *mesochorea*, id. t. c. p. 260, Amboina.
Panathia simulans, Butler, t. c. p. 35, Nias.
Abraxas molossaria, Oberthür, op. cit. x. p. 32, pl. iii. fig. 10, Kouy-Tcheou.
Phasiane aberrata, H. Edwards, t. c. p. 47, Hudson's Bay.
Hyposidra lutosaria, Pagenstecher, t. c. p. 261, pl. vii. fig. 3, Amboina.
Rhypharia largeteauii, Oberthür, t. c. p. 32, pl. i. fig. 5, Kouy-Tcheou.
Eupithecia curzoni, Gregson, Ent. xvii. p. 230, Shetland (it is probably a form of *E. nanata*, Hübn.; McArthur & Hoffmann, t. c. pp. 276 & 277);
E. artemisiata and *littorata*, Constant, Ann. Soc. Ent. Fr. (6) iv. pp. 203 & 205, pl. ix. figs. 3 & 4, Alpes Maritimes; *E. liguriata*, Millière, Rev. d'Ent. iii. p. 3, Italy.
Lobophora choaspitis, Oberthür, t. c. p. 33, pl. i. fig. 10, Askold.
Melanippe artemidora, id. *ibid.* fig. 6, Askold.
Phibalapteryx pacuviaria, id. t. c. p. 34, pl. i. fig. 7, Sidemi.
Scotosia sideritaria, id. *ibid.* fig. 13, Thibet; *S. corrugata*, Butler, t. c. p. 275, Yesso.
Tatosoma timora, Meyrick (= *agrionata*, Meyr., nec Walk.), N. Z. J. Sci. ii. p. 234, New Zealand.
Arsinoe prionota, id. Tr. N. Z. Inst. xvi. p. 73, New Zealand.
Cidaria timozzaria and *casearia*, Constant, Ann. Soc. Ent. Fr. (6) iv. pp. 201 & 202, pl. ix. figs. 1 & 2, Corsica; *C. chrysoprasaria*, Oberthür, t. c. p. 34, pl. i. fig. 2, Thibet; *C. purpurifera*, Fereday, Tr. N. Z. Inst. xvi. p. 119, New Zealand.
Harpalyce parora, Meyrick (= *humeraria*, Meyr., nec Walk.), N. Z. J. Sci. ii. p. 234, New Zealand.
Odezia brephos, Oberthür, op. cit. ix. p. 22, pl. ii. fig. 3, Thibet.

SICULODIDÆ.

- Siculodes*. Saalmüller, Lep. Mad. i. pl. v., redescibes and figures *S. werneburgalis*, Kef. (= *plagula*, Guén.), fig. 60, p. 213, *mellea*, Saalm., fig. 61, p. 214, and *minutula*, Saalm., fig. 59, p. 216.
Siculodes aenea, id. t. c. p. 215, Nossi-Bé; *S. cuprea*, Pagenstecher, JB. nass. Ver. xxxvii. p. 264, Amboina: spp. un.

PYRALIDÆ.

- MEYRICK, E. On the Classification of Australian *Pyralidina*. Tr. E. Soc. 1884, pp. 61-80 & 277-350.

In the first paper, 15 genera of the families *Epipaschiadæ* and *Pyralidæ* are tabulated, and 24 species are specially noticed, among those already described being *Stericta habitalis*, Guén. (= *Pyralis nauplialis* and *porphyralis*, Walk.), *Stemmatophora vibicalis*, Led., *Ocrasa decoloralis*, Lcd.,

albidulis, Walk., *Asopia farinalis*, Linn. (= *Pyrallis fraterna*, Butl.), *Endotricha pyrosalis*, Guén. (= *E. ignealis*, Guén., *Pyrallis stilbealis*, *docilisalis*, *Messatis sabirusalis*, *Paconia albifimbrialis*, *Tricomia auroralis* Walk., and *Rhodaria robina*, Butl.), and *Tjanata*, Hübn., noticed as new to (= *ustalis*, Snell.), redescribed, t. c. pp. 19-210, & xxvii. (cf. also Vängel,

The second paper includes the *Musotimidae*, *Botyus*, and *Scopula*, most of the genera being fully redescribed, with additional notes on *Epipaschiadae* and *Pyrallididae*. General remarks on characters and geographical distribution are prefixed. Many new genera and species are described, and the most important known species noticed (exclusive of synonymic notes, which are too extensive to be given in detail) are as follows:—*Glyphodes excelsalis*, Walk., *Diusenia ramburialis*, Dup., *grammalis*, Doubl., *Nomophila noctuella*, W. V., *Scopula dicealis*, Walk., *Mecyna polygonalis*, Hübn., *deprivalis*, Walk., *Eurycreon ptousalis*, Walk., *massalis*, Walk., *Tetraprosopus meyrickii*, Butl.; *Ennychia melissalis*, Walk., = *Threnodes pollinalis*, W. V., and is probably not Australian.

SNELLEN, P. C. T. *Lepidoptera van Celebes, verzameld door M. C. Piepers, met aantekeningen en beschrijving der nieuwe soorten. Tweede afdeeling: Heterocera. iv. Pyralidina. Tijdschr. Ent. xxvii. pp. 35-54, pls. iii.-v.*

Extends from *Heterocnephes* to *Ephestia*. One new species is described, and the following known species of Snellen's are figured (*Crambide* being included in the present enumeration, for convenience):—*Heterocnephes strangulalis*, figs. 1 & 1a, *Cænostola palliventralis*, figs. 2 & 2a, b, *pallicalis*, figs. 3 & 3a, *eromenalis*, figs. 4 & 4a, *Omiodes analis*, figs. 5 & 5a, *Phycidicera salebrialis*, figs. 6 & 6a, *Rhinphalea fastidialis*, figs. 7 & 7a, *Metasia lilliputalis*, fig. 8, *Siriocauta simialis*, figs. 9 & 9a, b, *Nicuria latissquimalis*, figs. 10 & 10a, b, *Decticogaster zonulalis*, figs. 11 & 11a, pl. iii., *Decelia terrosalis*, figs. 1 & 1a, b, *Ædiodes trimaculalis*, figs. 2 & 2a, *orientalis*, figs. 3 & 3a, b, *Lampridia fuliginalis*, figs. 4 & 4a, *Spilomela ommatalis*, figs. 5 & 5a, *Conchylodes corycialis*, fig. 6, *baptalis*, fig. 7, *Phalangiodes columalis*, fig. 8, *Spanista pretiosalis*, figs. 9 & 9a, *Physematia pollutalis*, figs. 10 & 10a, *Parapoynx hebraicalis*, figs. 11 & 11a, *fregonalis*, fig. 12, pl. iv., *diminutalis*, fig. 1, *cuneolalis*, fig. 2, *Cymoriza montenalis*, figs. 3 & 3a, *fulvobasalis*, figs. 4 & 4a, *Margarosticha bimaculalis*, figs. 5 & 5a, *infuscatalis*, fig. 6, *amminatalis*, fig. 7, *Calamotrophia fascicostella*, fig. 8, *Diptychophora amænella*, fig. 9, *Melissoblaetes rufovenalis*, fig. 10, *Galleria macroptera*, fig. 11, and *Euzophora subterebrella*, figs. 12 & 12a, pl. v.

Botys melusalis and *Scopula strenualis*, Walk. Transformations described; Forsayeth, Tr. E. Soc. 1884, pp. 417 & 418.

Cledeobia angustalis, W. V. Transformations described; Porritt, Ent. M. M. xxi. p. 124.

Aglossa pinguinalis, Linn., and *cuprealis*, Hübn. Natural history; Buckler & Hellins, Ent. M. M. xx. pp. 193-199, & xxi. pp. 75-79.

List of *Scopariidae* of New Zealand; Meyrick, N. Z. J. Sci. ii. pp. 235-237. Several new species are described, and the following synonymy noted:—*Scoparia ustimacula*, Feld. (= *conifera*, Butl.), *sub*

marginalis, Walk. (= *maoriella*, Walk.), *indistinctalis*, Walk. (= *rakoiensis*, Knaggs), and *feredayi*, Knaggs (= *moanalis*, Feld.).

multinealis, Guén., and probably several other species of the *Deuterarcha*, *id. t. c. 8* *apicalis*, Guén., larva described: Porritt, *xanthomela* and *mesoc.* 1 & 102.

Conogethes, *id. t. c. 3*, W. V. Transformations described; *id. op. cit.* xxi. pp. 30-32.

Botys onophasalis and *thisoalis*, Walk., are identical; Butler, Ann. N. H. (5) xiii. p. 187. *B. hyalinalis*, Hübn.: life-history; Hellins & Jeffrey, Ent. M. M. xxi. pp. 90 & 99-101. *B. urticata*, Linn.: early appearance; frequents mint: McLachlan and others, Ent. M. M. xx. pp. 227 & 257. *B. nubilalis*, Hübn. (= *silacealis*, Hübn., and *hyalinalis*, Guén.): transformations described and figured; it is very injurious to maize and hemp: Robin & Laboulbène, Ann. Soc. Ent. Fr. (6) iv. pp. 5-16, pl. i. figs. 1-4.

Scopula quadralis, Doubl. Larva described; Purdie, N. Z. J. Sci. ii. p. 116.

Glyphodes actorionalis, Led.; nec Walk., renamed *G. (?) ledereri*; Butler, t. c. p. 203.

Pantographa limata, Grote. Larva described; Fernald, Canad. Ent. xvi. pp. 26 & 27.

Eudiptis hyalinata, Linn., popularly described and figured; W. Saunders, Rep. E. Soc. Ont. 1883, pp. 23 & 24, fig. 4.

Stenia punctalis, W. V. Transformations described; Hellins, Ent. M. M. xxi. pp. 121-123.

Hydrccampa formosalis, Clem. Transformations described; Packard, Am. Nat. xviii. pp. 824-826, pl. xxiv.

Cirrochrista fumipalpalis, Feld. & Rog., described; Pagenstecher, JB. nass. Ver. xxxvii. p. 282.

Cataglyphis pyropalis, Guén. The anatomy and habits of the larva, pupa, and cocoon are described, special attention being given to the structure of the gills and tracheal system of the larva. Brief remarks on 5 other aquatic Brazilian *Lepidoptera* are added. Müller-Blumenau, Arch. f. Nat. l. pp. 194-211, pl. xiv.

New family, genera, and species :—

Musotimida, fam. n., Meyrick, Tr. E. Soc. 1884, p. 286. Fore wings with vein 10 absent, 8 and 9 stalked, sometimes also 7 out of 8. Hind wings with vein 6 from upper angle of cell, 7 from upper margin of cell before angle, anastomosing with 8. Abdomen in ♂ with uncus strongly developed, complex. To include *Trichophyesis*, g. n., t. c. p. 287 (type, *T. neophyla*, sp. n., *ibid.*, Queensland, New South Wales), and *Musotima*, g. n., t. c. p. 288, for *Diathrausta aduncalis*, Feld., *Isepteryx nitidalis*, Walk. (= *D. timarchis*, Feld.), *I. ochropteralis*, Guén., and *M. acris*, sp. n., t. c. p. 289, New South Wales, Tasmania.

Eretmopteryx flabelligera (g. & sp. nn., ?, *Pyralidæ* ?), figured by Saal-müller, Lep. Mad. i. pl. vi. fig. 80, in advance of the text.

Amphibolia, Snellen, Romanoff's Mém. Lep. i. p. 159. *Botyda*, between *Hellula* and *Aporodes*, but with a strong superficial resemblance to

Catastia. Type, *C. pyranstoides*, Ersch. (redescribed and figured, *t. c.* pp. 160 & 161, pl. x.).

Rinecera, Butler, Mem. Nat. Ac. Sci., Rep. Eclipse, 1877, noticed as new to *Botididae*; allied to *Mesocondyla* and *Botys*, p. 210, & xxvii. (cf. also Vängel, sp. n., *ibid.*, Caroline Island.

Titanoceros, Meyrick, Tr. E. Soc. 1884, p. 62. Additional notes on of hind wings anastomosing with 7; maxillary palpi obsolete. Type, *T. cataxantha*, sp. n., *t. c.* p. 63, Sydney.

Catamola, *id. t. c.* p. 63. Allied to last; maxillary palpi short, filiform, basal process of antennæ long. Types, *Bertula thyrissalis*, *Acrobasis xanthomelalis* and *funerea*, Walk. (redescribed, *t. c.* pp. 64 & 65); add *C. elassota*, sp. n., *id. t. c.* p. 280, S. Australia.

Astrapometis, *id. t. c.* p. 67. Differs from *Catamola* by the short basal process of the antennæ. Type, *Pyralis saburalis*, Walk. (redescribed, *ibid.*).

Balanotis, *id. t. c.* p. 69. *Pyralididae*; vein 8 of hind wings free; ocelli present; tongue well developed; fore wings in ♂ with a thickened gland beneath costa. To include *Cardamyla didymalis*, Walk., and *Salma recurvalis*, Walk. (redescribed, *t. c.* pp. 69 & 70), and *B. mnesibrya*, New South Wales, and *hercophora*, Port Darwin, spp. nn., *t. c.* pp. 71 & 281.

Edematophaga, *id. t. c.* p. 73. Allied to *Balanotis*, but with no gland on fore wings in ♂. Type, *Pyralis egusalis*, Walk. (? = *Gauna subferalis*, Walk.); redescribed, *t. c.* p. 74.

Enogenes, *id. t. c.* p. 75. *Pyralididae*; vein 8 of hind wings anastomosing with 7; maxillary palpi present; labial palpi porrected, with long rough hair beneath. Type, *Botys fugalis*, Feld. (redescribed, *ibid.*).

Scenedra, *id. ibid.* Allied to *Endotricha*; vein 8 of hind wings anastomosing with 7; maxillary palpi absent; patagia in ♂ not very long. To include *Pyralis decoratalis*, Walk. (= *contentalis*, Walk.), type, and (?) *Curena externalis*, Walk. (redescribed, *t. c.* pp. 76 & 77).

Persicoptera, *id. t. c.* p. 283. Allied to *Semnia* and *Eurypta*; veins 8 and 9 rise separately from 7; maxillary palpi distinct; and basal joint of the antennæ long. Type, *Endotricha pulchrinalis*, Guén. (= *Scopula gavisalis*, Walk.).

Diplopseustis, *id. t. c.* p. 284. *Pyralididae*, but with maxillary palpi resembling those of *Crambus* and *Scoparia*. To include *Cymoriza minima*, Butl. (redescribed, *t. c.* p. 285), and *D. hemiophthalma*, sp. n., *t. c.* p. 286, Sydney.

Pessocosma, *id. t. c.* p. 300. Allied to *Sameodes*; fore wings with no costal fold; terminal spurs of hind tibiae present. Type, *Lepyrodes iolealis*, Walk. (redescribed, *t. c.* p. 301).

Dolichosticha, *id. t. c.* p. 304. Allied to *Cnaphalocrocis*, but veins 10 and 11 of fore wings separate. Type, *Asopia venialis*, Walk. (= *marialis*, Walk.); redescribed, *t. c.* p. 305.

Beotarcha, *id. t. c.* p. 305. Affinities uncertain. Type, *Botys passicornis*, Walk. (= *tenialis*, Snell.).

Tetracona, *id. t. c.* p. 307. Allied to *Agrotera* (?). Type, *Ædiodes amathealis*, Walk. (= *Pyralis ornatalis*, Walk.); redescribed, *ibid.*

Molybdantha, *id. t. c.* p. 309. Differs from *Notarcha* by the triangularly dilated maxillary palpi. Type, *Botys bracteolalis*, Zell.

Notarcha, Meyrick, t. c. p. 310. Separated from *Botys*. To include *Phalæna ruralis*, Scop., *Zebronia cassualis* and *Astura clytusalis*, Walk., *Botys multilinealis*, Guén., and *N. chrysoplasta*, sp. n., t. c. p. 311, Queensland.

Deuterarcha, id. t. c. p. 312. Allied to *Notarcha*. To include *D. xanthomela* and *mesochlora*, spp. nn., t. c. p. 313, Queensland.

Conogethes, id. t. c. p. 314. Allied to *Notarcha*. To include *Astura punctiferalis*, Guen., and *Botys infundibulalis*, Snell.

Pachyzancla, id. t. c. p. 315. Allied to *Conogethes*. Type, *Botys mutualis*, Zell.

Pelecyntis, id. t. c. p. 315. Differs from *Pachyzancla* and *Omiodes* by the triangularly dilated terminal joint of the labial palpi. Type, *Pyrausta absistalis*, Walk.

Proternia, *id. t. c.* p. 317. Allied to *Semioceros*. Type, *P. philocapna*, sp. n., *ibid.*, New Zealand.

Semioceros, id. t. c. p. 318. To include *Botys gratalis*, Led., *Salbia amphicedalis* and *Nacoleia murcusalis*, Walk. (redescribed, t. c. pp. 318 & 319), and *S. chrysorycta*, sp. n., t. c. p. 320, Queensland.

Aphytoceros, id. t. c. p. 320. Affinities uncertain. Type, *Botys lucusalis*, Walk.

Atelocentra, *id. t. c.* p. 323. Allied to *Ebuleu sambucalis*, W. V. Type, *A. chloraspis*, sp. n., *ibid.*, Victoria.

Myriostephes, id. t. c. p. 327. Differs from *Botys* by the dilated maxillary palpi. Type, *M. matura*, sp. n., t. c. p. 328, Sydney.

Acallalis, Pagenstecher, JB. nass. Ver. xxxvii. p. 269. Between *Calamochrous* and *Pantographa*. Type, *A. iridalis*, sp. n., t. c. p. 270, pl. vii. fig. 7, Amboina.

Mnesictena, Meyrick, t. c. p. 328. Distinguished from its nearest allies by the pectination of the lower median of hind wings. To include *Margaritia flavidalis*, Doubl., *Scopula notata*, Butl., and *M. marmarina*, sp. n., t. c. p. 329, New Zealand

Nesarcha, *id.* t. c. p. 330. Affinities doubtful. Type, *Scopula hybrealis*, Walk. (redescribed, *ibid.*).

Metallarcha, *id. t. c.* p. 331. Distinguished from *Eurycreon* by the retracted valves and filiform maxillary palpi. To include *M. calliaspis*, *diplochrysa*, p. 332, *epichrysa*, p. 333, and *eurychrysa*, p. 334, spp. *nn.*, *t. c.*, S. Australia. (*Botys achæusalis*, Walk., probably also belongs to the genus.)

Proteræa, *id. t. c.* p. 335. Allied to *Eurycreon*, but the frontal projection is less developed, the antennæ much more strongly ciliated and the maxillary palpi not terminally expanded. Type, *P. comastis*, sp. n., *ibid.* (Australia?).

frontal projection. Type, *H. mirabilis*. very long
Sydney, N.S.W., Australia. *haliaphra*, *Corallolais*.

Tritaea, *id. t. c.* p. 341. Intermediate between *Eurycreon* and *Scoparia*, but the hind wings are half as broad again as the fore wings. Type, *Scopula ustalis*, Walk.

Eclipsiodes, id. t. c. p. 343. *Scopariadae*. Type, *E. crypsixantha*, sp. n., t. c. p. 343, Australia.

Catastia. Type, *C. pyranstoides*, Ersch. (redescribed and figured, *t. c.* pp. 160 & 161, pl. x.).

Rinecera, Butler, Mem. Nat. Ac. Sci., Rep. Feline, Dublin, noticed as new to *Botididæ*; allied to *Mesocondyla* and *Botys*, pp. 210, & xxvii. (cf. also Vängel, sp. n., *ibid.*, Caroline Island.

Titanoceros, Meyrick, Tr. E. Soc. 1884, p. 62. Additional notes on of hind wings anastomosing with 7; maxillary palpi obsolete. Type, *T. cataxantha*, sp. n., *t. c.* p. 63, Sydney.

Catamola, *id. t. c.* p. 63. Allied to last; maxillary palpi short, filiform, basal process of antennæ long. Types, *Bertula thyrisalis*, *Acrobasis xanthomelalis* and *funerea*, Walk. (redescribed, *t. c.* pp. 64 & 65); add *C. classota*, sp. n., *id. t. c.* p. 280, S. Australia.

Astrapometis, *id. t. c.* p. 67. Differs from *Catamola* by the short basal process of the antennæ. Type, *Pyralis saburalis*, Walk. (redescribed, *ibid.*).

Balanotis, *id. t. c.* p. 69. *Pyralididæ*; vein 8 of hind wings free; ocelli present; tongue well developed; fore wings in ♂ with a thickened gland beneath costa. To include *Cardamyla didymalis*, Walk., and *Salma recurvalis*, Walk. (redescribed, *t. c.* pp. 69 & 70), and *B. mnesibrya*, New South Wales, and *hercophoru*, Port Darwin, spp. nn., *t. c.* pp. 71 & 281.

Edematophaga, *id. t. c.* p. 73. Allied to *Balanotis*, but with no gland on fore wings in ♂. Type, *Pyralis agusalis*, Walk. (? = *Gauna subferalis*, Walk.); redescribed, *t. c.* p. 74.

Enogenes, *id. t. c.* p. 75. *Pyralididæ*; vein 8 of hind wings anastomosing with 7; maxillary palpi present; labial palpi porrected, with long rough hair beneath. Type, *Botys fugalis*, Feld. (redescribed, *ibid.*).

Scenedra, *id. ibid.* Allied to *Endotricha*; vein 8 of hind wings anastomosing with 7; maxillary palpi absent; patagia in ♂ not very long. To include *Pyralis decoratalis*, Walk. (= *contentalis*, Walk.), type, and (?) *Curena externalis*, Walk. (redescribed, *t. c.* pp. 76 & 77).

Persicoptera, *id. t. c.* p. 283. Allied to *Semnia* and *Eurypta*; veins 8 and 9 rise separately from 7; maxillary palpi distinct; and basal joint of the antennæ long. Type, *Endotricha pulchralis*, Guén. (= *Scopula gavisalis*, Walk.).

Diplopseustis, *id. t. c.* p. 284. *Pyralididæ*, but with maxillary palpi resembling those of *Crambus* and *Scoparia*. To include *Cymoriza minima*, Butl. (redescribed, *t. c.* p. 285), and *D. hemiophthalma*, sp. n., *t. c.* p. 286, Sydney.

Pessocosma, *id. t. c.* p. 300. Allied to *Sameodes*; fore wings with no costal fold; terminal spurs of hind tibiæ present. Type, *Lepyrodus ioealis*, Walk. (redescribed, *t. c.* p. 301).

Dolichosticha, *id. t. c.* p. 304. Allied to *Cnaphalocrocis*, but veins 10 and 11 of fore wings separate. Type, *Asopia veniliialis*, Walk. (= *marialis*, Walk.); redescribed, *t. c.* p. 305.

Beotarcha, *id. t. c.* p. 305. Affinities uncertain. Type, *Botys Passicornis*, Walk. (= *tenialis*, Snell.).

Tetracona, *id. t. c.* p. 307. Allied to *Agrotera* (?). Type, *Ædiodes amathealis*, Walk. (= *Pyralis ornatalis*, Walk.); redescribed, *ibid.*

Molybdantha, *id. t. c.* p. 309. Differs from *Notarcha* by the triangularly dilated maxillary palpi. Type, *Botys bracteolalis*, Zell.

Notarcha, Meyrick, *t. c.* p. 310. Separated from *Botys*. To include *Phaena ruralis*, Scop., *Zebonia cassusalis* and *Astura clytusalis*, Walk., *Botys multimaculis*, Guén., and *N. chrysoplasta*, sp. n., *t. c.* p. 311, Queensland.

Deuterarcha, *id. t. c.* p. 312. Allied to *Notarcha*. To include *D. xanthomela* and *mesochlora*, spp. nn., *t. c.* p. 313, Queensland.

Conogethes, *id. t. c.* p. 314. Allied to *Notarcha*. To include *Astura punctiferalis*, Guén., and *Botys infundibulalis*, Snell.

Pachyzancla, *id. t. c.* p. 315. Allied to *Conogethes*. Type, *Botys mutualis*, Zell.

Pelecyntis, *id. t. c.* p. 315. Differs from *Pachyzancla* and *Omiodes* by the triangularly dilated terminal joint of the labial palpi. Type, *Pyrausta abstatalis*, Walk.

Proternia, *id. t. c.* p. 317. Allied to *Semioceros*. Type, *P. philocapna*, sp. n., *ibid.*, New Zealand.

Semioceros, *id. t. c.* p. 318. To include *Botys gratalis*, Led., *Salbia amphicedalis* and *Nacolcia murcusalis*, Walk. (redescribed, *t. c.* pp. 318 & 319), and *S. chrysorycta*, sp. n., *t. c.* p. 320, Queensland.

Aphytoceros, *id. t. c.* p. 320. Affinities uncertain. Type, *Botys lucusalis*, Walk.

Atelocentra, *id. t. c.* p. 323. Allied to *Ebuleu sambucalis*, W. V. Type, *A. chloraspis*, sp. n., *ibid.*, Victoria.

Myriostephes, *id. t. c.* p. 327. Differs from *Botys* by the dilated maxillary palpi. Type, *M. matura*, sp. n., *t. c.* p. 328, Sydney.

Acellalis, Pagenstecher, JB. nass. Ver. xxxvii. p. 269. Between *Calamochrous* and *Pantographa*. Type, *A. iridalis*, sp. n., *t. c.* p. 270, pl. vii. fig. 7, Amboina.

Mnesictena, Meyrick, *t. c.* p. 328. Distinguished from its nearest allies by the pectination of the lower median of hind wings. To include *Margaritia flavidalis*, Doubl., *Scopula notata*, Butl., and *M. marmarina*, sp. n., *t. c.* p. 329, New Zealand.

Nesarcha, *id. t. c.* p. 330. Affinities doubtful. Type, *Scopula hybrealis*, Walk. (redescribed, *ibid.*).

Metallarcha, *id. t. c.* p. 331. Distinguished from *Eurycreon* by the retracted valves and filiform maxillary palpi. To include *M. calliaspis*, *diplochrysa*, p. 332, *epichrysa*, p. 333, and *eurychrysa*, p. 334, spp. nn., *t. c.*, S. Australia. (*Botys achæusalis*, Walk., probably also belongs to the genus.)

Proteræa, *id. t. c.* p. 335. Allied to *Eurycreon*, but the frontal projection is less developed, the antennæ much more strongly ciliated and the maxillary palpi not terminally expanded. Type, *P. comastis*, sp. n., *ibid.* (Australia?).

Criophthona, *id. t. c.* p. 339. Agrees with *Sedenia* in the very long frontal projection. To include *C. finitima*, S. Australia, and *haliaphra*, Sydney, sp. n., *t. c.* p. 340.

Tritæa, *id. t. c.* p. 341. Intermediate between *Eurycreon* and *Scoparia*, but the hind wings are half as broad again as the fore wings. Type, *Scopula ustalis*, Walk.

Eclipsiodes, *id. t. c.* p. 343. *Scopariada*. Type, *E. crypsixantha*, sp. n., *t. c.* p. 343, Australia.

Nyctarcha, Meyrick, *t. c.* p. 344. *Scopariadæ*. Types, *Orosana persumptana* and *ophideresana*, Walk. (redescribed, *t. c.* pp. 344 & 345).

Xeroscopa, *id. t. c.* p. 349. *Scopariadæ*. To include *Scoparia ejuncida*, Knaggs, and *Crambus rotuellus*, Feld.; add *X. niphospora*, *apheles*, *aspidota*, and *leucogramma*, spp. nn., *id. N. Z. J. Sci.* ii. p. 237, New Zealand. *Cacozelia cholica*, Meyrick, *Tr. E. Soc.* 1884, p. 66, Duaringa, Queensland.

Cledeobia (?) *albipalpalis*, Pagenstecher, *JB. nass. Ver.* xxxvii. p. 265, pl. vii. fig. 9, Amboina.

Aglossa brabanti, Ragonot, *Bull. Soc. Ent. Fr.* (6) iv. p. vi., Basses-Alpes.

Asopia caustica, Meyrick, *t. c.* p. 282, Queensland.

Endotricha coreacealis, Pagenstecher, *t. c.* p. 266, Amboina; *E. heliopa* and *athopa*, Meyrick, *t. c.* pp. 78 & 79, Sydney.

Metrea argentalis, H. Edwards, *Papilio*, iv. p. 19, Mexico.

Scoparia cataxesta, *epicomia*, *azena*, *elaphra*, *paltomucha*, and *deltophora*, Meyrick, *N. Z. J. Sci.* ii. p. 236, New Zealand.

Botys subochracealis, *nigrodentalis*, fig. 3, p. 268, and *amboinalis*, fig. 2, p. 269, Pagenstecher, *t. c.* pl. vi., Amboina.

Eurycreon familiaris, Sydney, Tasmania, p. 336, *xenogama*, Adelaide, p. 337, and *capnochroa*, Australia, Tasmania, p. 338, Meyrick, *Tr. E. Soc.* 1884.*

Nomophila (?) *moluccana*, Pagenstecher, *t. c.* p. 269, Amboina.

Margarodes minor, *id. t. c.* p. 272, Amboina.

Glyphodes uncinialis, *id. t. c.* p. 273, pl. vii. fig. 6, Amboina.

Anartes (?) *tripunctalis*, pl. vi. fig. 5, and *A. (P) unipunctalis*, *id. t. c.* pp. 275 & 276, Amboina.

Pileocera (?) *flavomaculata*, *id. t. c.* p. 279, pl. vii. fig. 8, Amboina.

Leucinodes erosialis, *id. t. c.* p. 281, Amboina.

Entephria appensalis, Snellen, *Tijdschr. Ent.* xxvii. p. 41, pl. iii. figs. 12 & 12a, Celebes, Java.

CRAMBIDÆ.

Achræa grisella, Fabr., noticed as destructive to *Trigona* in Australia; it also thrives on raw sugar and dried fruit (currants and raisins): Hockings, *Tr. E. Soc.* 1884, pp. 155 & 156.

Ephestia elutella, Hübn., and *parasitella*, Staud., destructive to cocoa-beans; Kirby, *P. E. Soc.* 1884, p. xxxi. *E. passulella*, Barr., and *ficulella*, Dougl., imported from Texas with cotton-cake; Atmore, *Ent.* xvii. pp. 93 & 94, and *Ent. M. M.* xx. pp. 258 & 259. *E. kuhniella*, Zell. (a North American species which has occurred plentifully in Germany among breadstuffs), discussed; Karsch, *Ent. Nachr.* x. pp. 109-112: habits and ravages noticed; Girard & Ragonot, *Bull. Soc. Ent. Fr.* (6) iv. pp. lxxiii. & lxxiv.; De Borre and others, *C.R. Ent. Belg.* xxxiii. pp. ccxxxvi. & ccxxxvii.; Cavanna, *Bull. Ent. Ital.* xvi. p. 144.

Euzophera polyxenella, Mill. Occurrence in Holland noticed; Snellen, *Tijdschr. Ent.* xxvii. p. lxxxiv.

Homæosoma nebulælla, Hübn. Larva described and various parasites noticed; Porritt, *Ent.* xvii. pp. 143 & 144.

Myelois sp. (injurious to cranberry): life-history, ravages, and remedies discussed; Riley, Bull. Dep. Agric. Ent. U. S. iv. pp. 28 & 29. *M. rudella*, Zell.: larva described; Millière, Nat. Sicil. iv. p. 15.

Gymnancycla canella, Hübn. Transformations described; Porritt, t. c. pp. 111-113.

Dioryctria abietella, Zink., discussed; Wocke, Z. E. Ver. schles. (2) ix. p. 56.

Nephoteryx albicilla, Herr.-Schäff. (= *leucacrinella*, H.-S.). Specimens from the Jura, with yellow hairs on the head, noticed; Frey, MT. schw. ent. Ges. vii. p. 21.

Nephoteryx junthinella, Hübn.: note on transformations; Kreithner, Wien. ent. Z. iii. p. 18. *N. zimmermanni*, Grote, noticed as destructive to white pine in America; W. Saunders, Rep. E. Soc. Ont. 1883, pp. 57 & 58, and Rep. Fruit-Growers' Ass. Ont. 1883, pp. 327 & 328.

Pempelia palumbella, Fabr. Note on food-plants, &c.; Ragonot, Bull. Soc. Ent. Fr. (6) iv. p. cvii.

Phycita nebulo, Walsh, popularly described and figured; W. Saunders, Rep. E. Soc. Ont. 1883, p. 22, figs. 1 & 2.

Crambus pratellus, Linn., and *cerusellus*, W. V.: transformations described; Porritt, Ent. M. M. xxi. pp. 62, 63, 86, & 87. *C. furcatellus*, Zett.: localities and larva noticed; Hodgkinson, Ent. M. M. xx. p. 189. *C. hoplitellus*, Meyr., probably = *relatalis*, Walk.; Butler, Cist. Ent. iii. p. 75.

Ancylolomia contritella, Zell. Larva described; Millière, Rev. d'Ent. iii. p. 5.

Chilo sp. Habits of larva noticed; Kellicott, Rep. E. Soc. Ont. 1883, p. 21.

Crunophila, Meyr., = *Ubida*, Walk.; Butler, t. c. p. 75.

New species:—

Orocrambus (g. n. ?, *Crambidæ* ?) *melampetrus* (Meyr., MS.), Purdie, N. Z. J. Sci. ii. p. 168, New Zealand.

Acrobasis vaccinii, Riley, Canad. Ent. xvi. p. 237 (reared from cranberries, exact locality not stated).

Homæosoma inustella, Ragonot, Bull. Soc. Ent. Fr. (6) iv. p. vii., Basses-Alpes.

Pempelia cortella, Constant, Annu. Soc. Ent. Fr. (6) iv. p. 208, pl. ix. fig. 6, Corsica.

Euzophera conicolella, id. t. c. p. 209, pl. ix. fig. 7, Alpes Maritimes.

Crambus graphellus, id. t. c. p. 207, pl. ix. fig. 5, Gulf of Juan.

Dicymolomia sauberi, Von Hedemann, Verh. Ver. Hamb. v. Anhang, San Francisco.

TORTRICIDÆ.

BARRETT, C. G. Notes on British Tortrices. Ent. M. M. xx. pp. 236-244 & 267-270, and xxi. pp. 41-45, 61, 62, & 126.

Relates to *Sciaphila* (the species of which are best distinguished by the shape of the wings), *Pedisca*, *Halonota*, *Tortrix*, *Peronea*, *Teras*,

Dictyopteryx, *Brachytenia*, *Penthina*, *Hypermercia*, *Ditula*, *Carpocapsa*, *Stigmonota*, *Grapholitha*, and *Retinia*. Many species are critically discussed, and the larvæ of a larger number described.

WALSINGHAM [LORD]. North American *Tortricidæ*. Tr. E. Soc. 1884, pp. 121-147, pl. iv.

The most important known species noticed are as follows:—*Cacæcia sanbornana*, Rob. (= *transiturana*, Walk.); *Lozotania virescana*, Clem. (of which *glaucana*, Walsingh., is probably a large var.); *Tortrix pallorana*, Rob. (?); *Amorbia humerosana*, Clem., var.; *Ænectra irrorea*, Rob. (redescribed and figured, p. 125, fig. 3); *Conchylis sartana*, Hübn. (distinct from *bimaculana*, Rob.), redescribed, p. 130; *Retinia* sp.; *Bactra lanceolana*, Hübn.; *Pædisca giganteana*, Riley (figured, fig. 11), *Pædisca constrictana*, Zell.; *Semasia corculana*, Zell., var. (the species is hardly distinct from *S. aspidiscana*, Hübn.), *S. (?) vestaliuna*, Zell., *S. argutana*, Clem., and *helianthana*, Riley (?); *Proteopteryx emarginana*, Walsingh.; *Steganoptycha*, *Steganoptycha lagopana*, Walsingh.; and *Phoxopteris* sp.

Forbes notices the habits and transformations of the following *Tortricidæ* injurious to strawberry in America (Rep. Ins. Illin. xiii. pp. 87-97, 111, & 112):—*Phoxopteris comptana*, Fröl. (= *Anchylopera fragariae*, Riley), pl. vi. fig. 7; *Cacæcia rosaceana*, Harr., *obsoletum*, Clem. (♀ = *transiturana*, Walk.); *Ptycholoma persicana*, Fitch; and *Eccopsis permundana*, Clem.

Notes on Tortrices observed in S. Wales and Sutherlandshire, and at Rannoch; Griffith & Jones, Ent. M. M. xx. pp. 259 & 260, & xxi. pp. 138 & 139.

Cacæcia transiturana and *obsoletana*, Walk., are sexes; *Teras minuta*, Rob., the following are synonyms:—*Tortrix malivorana*, Le Baron, *vaccinivorana*, Pack., *variolana*, Zell., and (dimorphous form) *cinderella*, Riley; *Sericoris argyrelana*, Zell., = *coruscana*, Clem.; and *Phoxopteris fragariae*, Walsh & Riley, = *comptana*, Fröl.: Fernald, Canad. Ent. xvi. pp. 63-65.

Tortrix musculana, Hübn., var., and *Sciophila osseana*, Scop., noticed from the Shetlands; Hoffmann, S. E. Z. xlv. p. 372.

Anchylopera vacciniana and *Teras oxycoccana*, Pack. (destructive to cranberry). Life-history, ravages, and remedies discussed; Riley, Bull. Dep. Agric. Ent. U. S. iv. pp. 10-26.

Penthina staintoniana, Barrett, may be the Scotch form of *sauciana*, Hübn.; Jones & Barrett, Ent. M. M. xxi. p. 139.

Teras hippophaeana, Von Heyden: Frey describes many varieties of this extremely variable species: MT. schw. ent. Ges. vi. pp. 689-692. *T. malivorana*, Le Baron, noticed; Forbes, Rep. Ins. Illin. xiii. p. 183. *T. oxycoccana*, Pack.: dimorphism; Riley, Papilio, iv. pp. 71 & 72.

Enophtira pilleriana, W. V. Ravages in the Côte d'Or and in Greece; André & Ragonot, Bull. Soc. Ent. Fr. (6) iii. pp. xc. & xxi., & iv. p. xcii. How far susceptible to cold; Bull. Ent. Ital. xvi. p. 308, and Wený, Rov. Lapok, i. pp. 123-125 & xv.

Tortrix fumeriferana, Clem. (spruce-bud *Tortrix*), discussed; Riley & Packard, Am. Nat. xviii. pp. 424-426, fig. *T. lafauryana*, Rag.: variation; Balding, Ent. M. M. xxi. pp. 195 & 196.

Padisca scudderiana, Clem. Habits of larva discussed; Riley & Kellicott, Rep. E. Soc. Ont. 1883, p. 18.

Dichroramphæ. Several species bred from tansy roots; Elisha, Ent. M. M. xxi. p. 90.

Hedya servillana, Dup. Larva and its habits described; Wood, Ent. M. M. xx. pp. 245 & 246.

Steganoptycha pusillana, Pey., and *abiegana*, Dup., differentiated; Wocke, Z. E. Ver. schles. (2) ix. pp. 58 & 59. *S. claypoleana*, Riley, noticed by him; Papilio, iii. p. 191.

Conchylis woliniana, Schleich, noticed; Frey, MT. schw. ent. Ges. vii. p. 22.

Phoxopteris comptana, Fröl., noticed; Cook, Pract. Ent. p. 19.

Peronea comparana, Hübn., double-brooded; Hodgkinson, Ent. xvii. p. 20.

Retinia comstockiana, Fernald (injurious to white pine in America): transformations popularly described and figured; W. Saunders, Rep. Fruit-Grower's Ass. Ont. 1883, p. 328, fig. 28, and Rep. E. Soc. Ont. 1883, p. 58, fig. 28. *R. duplana* of British authors appears to be a small dark variety of *turionella*, Linn.; Barrett, Ent. M. M. xxi. p. 126.

Carpocapsa pomonella, Linn., popularly described and figured; Westwood, Gard. Chron. (2) xxii. p. 300: var. from California with obsolete markings; Riley, Bull. Dep. Agric. Ent. U. S. iv. p. 90. *C. saltitans*, Westw.: "jumping seeds" noticed; Canad. Ent. xvi. p. 183.

Grapholitha olivaceana, Riley. Note on larva; Riley, Ent. M. M. xxi. p. 67.

Sciaphila octomaculana, Doubl. Transformations described; Shuttleworth, Ent. xvii. p. 6.

Eudemis botrana, W. V., popularly described and figured; W. Saunders, Rep. E. Soc. Ont. 1883, p. 26, fig. 8.

Conchylis manniana, Röslerst., and allies, discussed; the genus may be divided into 2 sections, (1) including *manniana*, Rösl., *udana*, Guén. (= *notulana*, Zell.), and *affinitana*, Dougl., and (2) including *alissima*, Rag., *mussehlana*, Tr., *rectisana*, Doubl., and *geyeriana*, Herr.-Schäff.: Ragonot, Bull. Soc. Ent. Fr. (6) iii. p. cxix. *C. curvistrigana*, Walk.: on rearing; Wocke, t. c. p. 57. *C. roserana*, Fröl., injurious to vine at Metz; Bellevoye, Bull. Soc. Ent. Fr. (6) iv. p. xcvi.

New genera and species:—

Pseudogalleria, Ragonot, Bull. Soc. Ent. Fr. (6) iv. p. 1. Allied to *Grapholitha*, but with a superficial resemblance to *Galleria*. Type, *Gall. inimicella*, Zell.

Pseudoconchylis, Walsingham, Tr. E. Soc. 1884, p. 133. Allied to *Conchylis*; branches 7 & 8 of fore wings from a common stem, branch 2 rising from outer third of cell, hind wings with branches 3, 4, and 5 remote from each other, 6 and 7 separate and nearly parallel. Type, *P. laticapitana*, sp. n., *ibid.*, California.

Sciaphila sedana, Constant, Ann. Soc. Ent. Fr. (6) iv. p. 211, pl. ix. fig. 8, Alps of Dauphiné; *S. arizonana*, Walsingham, Tr. E. Soc. 1884, p. 124, pl. iv. fig. 1, Arizona.

Enectra striata, pl. iv. fig. 2, Montana, and *distincta*, Arizona, Walsingham, *t. c.* p. 126.

Platynota stultana, Sonora, Mexico, and *semiustana*, N. Carolina, *id. t. c.* pp. 127 & 128.

Conchylis alismæna, Ragonot, Bull. Soc. Ent. Fr. (6) iii. p. cxviii., England (?), France (?), and Germany; *C. insulana*, Constant, *t. c.* p. 212, pl. ix. fig. 9, Alpes Maritimes; *C. edwardsiana*, p. 128, *comes*, Arizona, p. 129, *sonoræ*, Sonora, Mexico, p. 130, *hospes*, N. Carolina, *plicana*, Sonora, Mexico, p. 131, *fulvotinctana*, fig. 5, and *dorsistriatana*, fig. 4, pl. iv., Arizona, p. 132, Walsingham, *t. c.*

Olindia fragalana, Millière, Rev. d'Ent. iii. p. 3, Italy.

Apheia (?) *inquadana*, Walsingham, *t. c.* p. 134, pl. iv. fig. 15, Arizona.

Penthina impudens, *id. t. c.* p. 135, N. Carolina.

Pædisca caniceps, fig. 9, Montana, *emaciatana*, fig. 7, Arizona, p. 137, *morrisoni*, fig. 8, p. 138, *corosana*, fig. 6, Montana, p. 139, and *aspidana*, fig. 10, Arizona, p. 140, Walsingham, *t. c.* pl. iv.

Semasia ochreicostana, fig. 13, p. 141, *montanana*, fig. 12, Montana, and *apacheana*, fig. 14, Arizona, p. 143, *id. t. c.* pl. iv.

Carpocapsa molybdana, Constant, *t. c.* p. 214, pl. ix. fig. 11, Alpes Maritimes.

Grapholitha grammæna, *id. t. c.* p. 213, pl. ix. fig. 10, Alpes Maritimes; *G.* (?) *duodecemstriata*, Walsingham, *t. c.* p. 146, pl. iv. fig. 16, Arizona.

TINEIDÆ.

HAGEN, H. A. The Types of *Tineina* in the Collection of the Museum in Cambridge, Massachusetts. *Papilio*, iv. pp. 96-99.

MEYRICK, E. Descriptions of Australian *Micro-Lepidoptera*. XI. *Ecophoridae* (continued). *P. Linn. Soc. N. S. W.* ix. pp. 721-792.

Includes the following genera, the tabulation only of which appeared in *P. Linn. Soc. N. S. W.* vii. [*cf. Zool. Rec. xx. Ins. p. 233*], but which are now fully characterized, and the species belonging to them described:—*Thyreopala* (founded in error, name withdrawn), *Philonympha*, *Peltophora*, *Orophia*, *Protomacha*, *Thalerotricha*, *Saropla*, *Meyr.*, *Pleurota*, *Hübner.*, *Atheropla*, *Cæranica*, *Eulachna*, *Aristeis*, *Cæsyra*, and *Epipyrga*, *Meyr.* The following known species are redescribed:—*Peltophora argutella*, Zell., *gloriosella*, Walk., *marionella*, Newm., *fulvia*, Butl., *proximella*, Walk., *basipluga*, Walk. (= *Ecophora quadratella*, Walk.), *conjunctella*, Walk., *privatella*, Walk. (= *Cryptolechia latiorella* and *Chezala allatella*, Walk.), *Protomacha consuetella*, Walk., *cara*, Butl., *Pleurota brevivittella*, Walk. (♂ described as *P. pyrosoma*, *Meyr.* p. 754), *Cæranica isabella*, Newm., *Cæsyra dichroella*, Zell. (= *Ecophora divisella*, Walk.), *concisella*, Walk. The European *Hægnella forcicella*, Scop., is referred to *Peltophora*.

— Descriptions of New Zealand *Micro-Lepidoptera*. III. *Ecophoridae*. *Tr. N. Z. Inst.* xvi. pp. 3-49.

The complete paper, of which an abstract appeared in *N. Z. J. Sci.* i. pp. 522-524 [*cf. Zool. Rec. xx. Ins. p. 225* and foll., where the new genera

and species are enumerated]. All the genera (14) and species (55) are described in full. Of 14 genera, 10 are endemic, 3 are also Australian, and 1 is cosmopolitan, but no species is yet known common to Australia and New Zealand. The following synonymy occurs:—*Proteodes carnifex*, Butl. (= *Cryptolechia rufosparsa*, Butl.), *Trachypepla conspicuella*, Walk. (= *Gelechia taongella*, Feld. & Rog.), *Semiocosma peroneanella*, Walk. (= *Cryptolechia lichenella*, Walk., and *Æcophora huttonii*, Butl.), *picarella*, Walk. (= *Psecadia teras*, Feld. & Rog.), *Gymnobathra flavidella*, Walk. (= *Æcophora utuella*, F. & R.).

SNELLEN, P. C. T. Nieuwe of weinig bekende *Micro-Lepidoptera* van Noord-Azie, met afbeeldingen door J. Van Leeuwen. Tweede Gedeelte: *Tineina* en *Pterophorina*. Tijdschr. Ent. xxvii. pp. 151–196, pls. viii.–x.

28 species noticed, mostly new.

Adela nobilis, *Nemotois raddeellus*, and *Depressaria costamaculella* of Christoph, redescribed and figured; Snellen, Tijdschr. Ent. xxvii. pp. 153, 155, & 158, pl. viii. figs. 2, 2a, 3, 3a, 5, & 5a.

Cemistoma scitella (destructive to pear) and *Lithocolletis comparella*, Zell. (destructive to poplar), noticed; J. Soc. Hort. Fr. (3) vi. pp. 329 & 330.

Ecapate gelatella, Linn. Late appearance in Surrey; Dobson, Ent. xvii. p. 94.

Tinea vastella, Zell. Habits discussed; Trimen, Tr. S. Afr. Soc. iii. pp. 24–26.

Incurvaria rupella, W. V., noticed; Krause, Ent. Nachr. x. p. 281.

Micropteryx. Ravages in Norwegian birch forests; Schøyen, Ent. Tidsskr. v. pp. 37–41.

Hyponomeuta. On destroying; Bull. Ent. Ital. xvi. p. 144. *H. cugnagellus* and *irreorellus*, Hübn.: larvæ differentiated; Ragonot, Bull. Soc. Ent. Fr. (6) iv. pp. lxxx. & lxxxi. *H. evonymella*, Scop., noticed; *Sandahl, Förh. vid. 12^{te} Skand. Naturforskaremötet i Stockholm, 1880 (Stockh., 1883), pp. 527 & 528. *H. stannellus*, Thunb.: life-history; Junod, Bull. Soc. Neuch. xiv. pp. 119–126, pl.

Depressaria badiella, Hübn., discussed, and transformations described; Buckler, Fletcher, & Stanton, Ent. M. M. xxi. pp. 3–5. *D. weirella*, Staint., bred from hemlock; Elisha, Ent. M. M. xxi. p. 90.

Gelechia cerealella, Oliv.: life-history, ravages, &c., discussed; Forbes, Rep. Ins. Illin. xii. pp. 144–154. *G. ligulella*, *teniolella*, Zell., *sircomella*, Staint., and probably also *corticella*, Haw., are varieties of one species; Threlfall, Ent. xvii. p. 113. *G. pinifoliella*, Comst., noticed as destructive to white pine in America, and transformations figured; W. Saunders, Rep. E. Soc. Ont. 1882, p. 277, fig. 19, & 1883, pp. 58, 59, 328 & 329, p. 29. *G. subocellea*, Steph.: note on food-plant; Fletcher, Ent. M. M. p. 758, at. t. c.

Atheropla melichlora, id. t. c. p. 73. *tertiella*, Herr.-Schäff. Note on trans-

Eulachma dasyptera, id. t. c. p. 361, Z. iii. p. 18.

Cæranica eritima, id. t. c. p. 760, S. Aliography, characters, &c., noticed;

Aristeïs chrysoteuchus, id. t. c. p. 762, †

Anarsia lineatella, Zell. Life-history, ravages, &c., discussed; Forbes, t. c. pp. 76-82, fig. 10 (larva).

Sophronia parenthesesella, Haw., noticed; Douglas, Ent. M. M. xxi. pp. 88 & 89.

Ecophora ustella, Walk. = *Zonopetala decisana*, Walk., but *Ec. retractella*, Walk., is not congeneric; Butler, Cist. Ent. iii. p. 74. *Ec. flavifrontella*, Hübn. : habits of larva; Heylaerts, C.R. ent. Belg. xxviii. p. cl. *Ec. woodiella*, Curt. : history of its occurrence in England; Sidebotham, Ent. xvii. pp. 52-54.

Eulechria siccella and *scopariella*, Walk., are synonymous; Butler, Cist. Ent. iii. p. 75.

Gymnobathra sarcozantha, Meyr., noticed; Purdie, N. Z. J. Sci. ii. p. 167.

Gracilaria hofmanniella, Schleich. On rearing; Wocke, Z. E. Ver. schles. (2) ix. p. xxxiv.

Ornix insperatella, Nickerl, noticed and redescribed; Frey, MT. schw. ent. Ges. vii. p. 26.

Coleophora siccifolia, Staint., *betulella*, Hein., and an undetermined species, noticed; Wocke, t. c. pp. 61 & 62. *C. vibicigerella* and *maritimella*, Staint. (species recently new to Britain), noticed; Machin, Ent. xvii. p. 87. *C. paripennella*, Zell., noticed; Stainton, t. c. p. 110. *C. tritici*, Lind., discussed; Ent. Nachr. x. pp. 209-212.

Goniodoma millierella, Rag. Transformations described, and larva and case figured; Milliére, Nat. Sicil. iv. pp. 12 & 13, pl. i. figs. 8 & 9. It is hardly distinct from *auroguttella*, Röslerst.; neither form occurs in England, but an undescribed *Coleophora* has been mistaken for the latter: Stainton, P. E. Soc. 1884, pls. xxxi. & xxxii.; Ent. M. M. xxi. pp. 59-61.

Metomorpha, Frey & Boll., being preoccupied, *Idiostoma*, Walsingh., will stand; [Lord] Walsingham, Canad. Ent. xv. p. 239.

Bedellia somnulentella, Staint. Larva described; Purdie, t. c. p. 116.

Laverna phragmitella, Staint., noticed; Porritt, Naturalist (2) ix. p. 213.

Lithocolletis endriella, Mann. : list of 26 hymenopterous parasites; Mina-Palumbo, Nat. Sicil. iv. p. 19. *L. hamadryella* noticed and figured; W. Saunders, t. c. pp. 277 & 278, fig. 20.

Nepticula. Larvæ, &c., of various species noticed; Threlfall, t. c. pp. 113 & 114. On the occurrence of various species in 1883, with notes on the larval habits, cocoon, &c., of *N. sericopeza*, Zell.; Warren, Ent. M. M. xx. pp. 186-188. *N. centifoliella*, Zell., noticed; Hodgkinson, Ent. xvii. p. 166.

New genera and species :—

Agisuna, Möschler, Verh. z.-b. Wien, xxxiii. p. 308. Allied to *Nemophora*. Type, *A. caffrariella*, sp. n., *ibid.* pl. x. *Nemophora* Scop.,

Phryganeutis, Meyrick, P. Linn. Soc. between *Protomacha* and *Pleurota*. *Micro-Lepidoptera*. III. *Ecophoridae*. Lofty, S. Australia.

Atabyria, Snellen, Tijdschr. Enn abstract appeared in N. Z. J. Sci. i. 18. p. 225 and foll., where the new genera

but superficially resembling *Depressaria*. Type, *A. bucephala*, sp. n., t. c. p. 166, pl. ix. figs. 1 & 1a, b, Suifun, &c.

Simaethis a-ceruleum (Rössl., MS.), p. 287, *plumbealis*, *parva*, and *regularis*, p. 288, Pagenstecher, JB. nass. Ver. xxxvii., Amboina.

Nemophora minutella, Snellen, Tijdschr. Ent. xxvii. p. 151, pl. viii. fig. 1, Amur.

Cerostoma leuconotella, id. t. c. p. 157, pl. viii. figs. 4 & 4a, Chingan Mountains.

Psecadia oculigera, Möschler, Verh. z.-b. Wien, xxxiii. p. 309, pl. xvi. fig. 25, Cafraria.

Coryptilum triphœnoides, Snellen, t. c. p. 265, Nias, Sumatra.

Depressaria leucocephala, figs. 6 & 6a, p. 160, *erythrella*, figs. 7 & 7a, Suifun, &c., p. 161, and *septicella*, figs. 8 & 8a, Chabarowska, p. 162, id. t. c. pl. viii.; *D. prostratella*, Constant, Ann. Soc. Ent. Fr. (6) iv. p. 215, pl. ix. fig. 12, Côte-d'Or.

Gelechia abietisella, Packard, Am. Nat. xviii. p. 296, Rhode Island; *G. pallipalpella* and *psammitella*, Snellen, t. c. pp. 167 & 168, pl. ix. figs. 2, 2a, 3, & 3a, Amur.

Recurvaria albidorsella, id. t. c. p. 169, pl. ix. figs. 4 & 4a, Amur.

Brachmia adumbratella, id. t. c. p. 170, pl. ix. figs. 5 & 5a, Amur.

Nothris albidella, id. t. c. p. 171, pl. ix. figs. 6 & 6a, Amur.

Xystophora tripunctella, figs. 7 & 7a, p. 172, *rutilella*, figs. 8 & 8a, p. 174, Amur, and *rufulella*, figs. 9 & 9a, Irkutsk, p. 175, id. t. c. pl. ix.

Lampros conchylidella, id. t. c. p. 176, pl. ix. figs. 9, 10, & 10a, Amur.

Sophronia curonella, Standfuss, S. E. Z. xlv. p. 193, Italy.

Philonympha aparthena, N. S. Wales, and *pura*, Tasmania, Meyrick, P. Linn. Soc. N. S. W. ix. p. 722.

Peltophora orthogramma, Sydney, S. Australia, *coniortia*, Sydney, p. 725, *atricollis*, p. 726, N. S. Wales, S. Australia, *incomposita*, N. S. Wales, p. 728, *theorica*, p. 729, *thermochroa*, N. S. Wales, *niphias*, Tasmania, p. 730, *carphalea*, Brisbane, p. 731, *crypsileuca*, Tasmania, p. 732, *helias*, p. 733, *psilopla*, Sydney, *glaphyropia*, Tasmania, p. 735, *cutaxera*, p. 736, *ceratina*, Tasmania, p. 737, id. t. c.

Orophia cinetica, id. t. c. p. 738, N. S. Wales, Victoria, Tasmania.

Protomacha chalcaspis, id. t. c. p. 740, N. S. Wales.

Thalerotricha myticella, id. t. c. p. 741, N. S. Wales, Tasmania.

Saropla melanoneura, *hyperocha*, N. S. Wales, p. 744, *calatella*, Queensland, N. S. Wales, South Australia, p. 745, *philocala*, N. S. Wales, and *cleronoma*, Brisbane, Sydney, p. 746, id. t. c.

Pleurotu themeropsis, *zalocoma*, p. 749, *tephrina*, p. 750, *pesephena*, Tasmania, *protogramma*, Victoria, p. 751, *crassinervis*, Sydney, p. 752, *callizona*, Victoria, *peloantha*, Brisbane, p. 753, *psammoxantha*, Queensland, N. S. Wales, *endesma* [sic], p. 755, *gypsina*, Victoria, p. 756, *chlorochyta*, N. S. Wales, Tasmania, *stasiastica*, p. 757, and *argoptera*, Sydney, p. 758, id. t. c.

Atheropla melichlora, id. t. c. p. 759, N. S. Wales.

Eulachna dasyptera, id. t. c. p. 361, Sydney.

Ceramica eritima, id. t. c. p. 760, S. Australia.

Aristeis chrysoteuches, id. t. c. p. 762, Sydney.

Cæsyra panchrysa, *paragramma*, p. 766, *iozona*, Sydney, *distephana*, N. S. Wales, S. Australia, p. 768, *anthodora*, Victoria, p. 769, *basilica*, N. S. Wales, S. Australia, Tasmania, p. 770, *triptycha*, *cyclotoma*, both from N. S. Wales, Victoria and Queensland, p. 771, *zonostola*, Sydney, p. 772, *ocellaris*, N. S. Wales, *zanclostoma*, S. Australia, p. 773, *annularis*, locality uncertain, *personata*, N. S. Wales, Victoria, p. 774, *ophthalmica*, Tasmania, *ecliptica*, p. 775, *catoptrina*, p. 776, *paracycla*, N. S. Wales, p. 777, *seleniaca*, Queensland, p. 778, *isogramma*, *philoxena*, *acrotopa*, Sydney, p. 779, *stenoptera*, N. S. Wales, Tasmania, S. Australia, *pyrrhoptera*, p. 780, *ochroptera*, N. S. Wales, *melliflua*, Queensland, p. 781, *deltosema*, S. Australia, *aphanes*, N. S. Wales, p. 782, *parvula*, N. S. Wales, S. Australia, Victoria, Tasmania, *aspasia*, S. Australia, p. 783, *panxantha*, *amylodes*, N. S. Wales, p. 784, *omichlota*, Queensland, *ergatis*, Brisbane, p. 785, *disema*, p. 786, *amphilyca*, Sydney, *apothyma*, S. Australia, p. 787, *gephyrota*, Queensland, *discincta*, Sydney, p. 788, *austalea*, N. S. Wales, p. 789, *arenivaga* and *vegrandis*, Sydney, p. 790, *id. t. c.*

Epipyrga agaclita, *id. t. c.* p. 791, Queensland.

Butalis cassiterella, Snellen, *t. c.* p. 178, pl. ix. figs. 11 & 11a, Amur.

Acrolepia unicolor, Wocke, Z. E. Ver. schles. (2) ix. p. 59, Silesia.

Gracilaria proteella, Frey, MT. schw. ent. Ges. vii. p. 24, Switzerland.

Coleophora limoniella (= *Goniodoma auroguttella*, Staint., nec Röslerst.), Stainton, Ent. M. M. xxi. p. 60, England; *C. strigiferella*, Snellen, *t. c.* p. 179, pl. x. figs. 1 & 1a, Irkutsk.

Bucculatrix lustrella, *id. t. c.* p. 181, pl. x. fig. 2, Amur.

Nepticula hodgkinsoni, Stainton, *t. c.* p. 103, Lancashire.

PTEROPHORIDÆ.

Pterophorus zophodactylus, Dup. (= *loewii*, Zell.), larva described; *P. gonodactylus*, W. V., is probably double-brooded: Porritt, Ent. M. M. xx. p. 228, and xxi. pp. 160 & 161.

Leioptilus microdactylus, Hübn. Habits of larva; Bignell & South, Ent. xvii. pp. 259 & 260, and Ent. M. M. xxi. pp. 110 & 111.

Platyptilia (*Amblyptilia*) *mærens*, sp. n., Snellen, Tijdschr. Ent. xxvii. p. 182, pl. x. figs. 3 & 3a, Amur.

Pterophorus (*Mimæsoptilus*) *hedemanni*, figs. 4 & 4a, p. 184, *P. (M.) vacillans*, figs. 5 & 5a, Amur, p. 187, *P. (M.) cæsius*, figs. 6 & 6a, Irkutsk, p. 189, *P. (M.) luteocinereus*, figs. 7 & 7a, p. 191, *P. (M.) emarginatus*, figs. 8 & 8a, Amur, p. 193, and *P. innocens*, figs. 9 & 9a, Irkutsk, pl. x. p. 195, spp. nn., *id. t. c.*

Deuterocopus ritsemæ, sp. n., Walsingham, Notes Leyd. Mus. vi. p. 243, Java.

DIPTERA.

BY

W. F. KIRBY, F.E.S., &c.

THE GENERAL SUBJECT.

BRAUER, O. F. Die Zweiflügler des kaiserlichen Museums zu Wien.

III. Systematische Studien auf Grundlage der Dipteren-Larven nebst einer Zusammenstellung von Beispielen aus der Literatur über dieselben und Beschreibung neuer Formen. Denk. Ak. Wien, xlvii. pp. 1-100, pls. i.-v. (Cf. Am. Nat. xviii. pp. 609-611.)

After a general introduction, the author discusses the characters of Dipterous larvæ, and their systematic importance, and regards his previous views on the classification of the *Diptera* into two main sections, according to the greater or less differentiation of the head of the larva, as entirely confirmed by recent observations. He gives the following table of the classification which he now proposes:—

Suborder I. ORTHORRHAPHA.

Sect. I. *Orthorrhapha nematocera*.

Tribe i. *Encephala*.

Fam. *Mycetophilidæ*, *Bibionidæ*, *Chironomidæ*, *Culicidæ*, *Blepharoceridæ*, *Simulidæ*, *Psychodidæ*, *Ptychopteridæ*, *Rhyphidæ*.

Tribe ii. *Oligoneura*.

Fam. *Cecidomyidæ*.

Tribe iii. *Polyneura*.

Fam. *Limnobiidæ*, *Tipulidæ*.

Sect. II. *Orthorrhapha brachycera*.

Tribe i. *Acroptera*.

Fam. *Lonchopteridæ*.

Tribe ii. *Platygenya*.

Group 1. *Homoeodactyla*.

(a.) *Nemophila*.

Fam. *Stratiomyidæ*, *Xylophagidæ*.

(b.) *Tunstomæ*.

Fam. *Tabanidæ*, *Acanthomeridæ*, *Leptidæ*.

(c.) *Bombylimorpha*.

Fam. *Acroceridæ*, *Nemestrinidæ*.

Group 2. *Heterodactyla*.(a.) *Procephala*.Fam. *Midaidæ*, *Apioceridæ*, *Asilidæ*, *Bombylidæ*.(b.) *Polytoma*.Fam. *Therevidæ*, *Scenopinidæ*.Tribe iii. *Orthogenya*.Fam. *Empidæ*, *Dolichopodidæ*.

Suborder II. CYCLORRHAPHA.

Sect. I. *Aschiza*, Becher.Tribe *Syrphidæ*.Fam. *Syrphidæ*, *Pipunculidæ*.Tribe *Hypocera*.Fam. *Phoridæ*, *Platypezidæ*.Sect. II. *Schizophora*, Becher.Tribe *Eumyidæ*.Group *Schizometopa* (*Calyptрата*, olim).Group *Holometopa* (*Acalyptрата* and *Conopidæ*, olim).Tribe *Pupipara*.

This is followed by a table of the relationships of the various families, proceeding from the lowest and oldest forms; a tabular view of the nervous system in Dipterous larvæ and imagines; a detailed statement of the characters of the larvæ of the various sections, extended in the *Stratiomyidæ* and *Æstridæ* even to genera; full descriptions of a few imperfectly known larvæ; and a very full bibliography, classified in the order of the subjects, and including occasional remarks on myasis, &c.

CARRIÈRE, J. On the Eyes of some *Invertebrata*. Q. J. Micr. Sci. (2) xxiv. pp. 673-681, pl. xiv.

Relates to the eyes of *Musca vomitoria* and *Sarcophaga carnaria*, the structure of which is compared with that observed in *Leptodora hyalina*, and in *Arca* and *Pectunculus*.

GERCKE, G. Ueber die Metamorphose einiger Dipteren. Verh. Ver. Hamb. v. pp. 68-80, pls. i. & ii.

Relates to *Norellia spinimana*, pl. ii. fig. 20, *Cleigastra apicalis*, *Rhamphidia longirostris*, pl. i. figs. 1-4, *Agromyza flava*, Meig., pl. ii. figs. 21-27, *Ceratopogon piceus*, Winnertz, pl. i. figs. 5-11, *Sciara intermedia*, Heyd., *giraudii*, Egger, *Hydrellia fulviceps*, Stenl., fig. 28, *Ephydra breviventris*, Löw, figs. 31 & 32, an undetermined species of *Ephydrinae*, figs. 29 & 30, pl. ii., *Ctenophora atrata*, Linn., pl. i. figs. 12-19, *Azelia macquarti*, Zett. (?), pl. ii. fig. 34, *Cyrtoneura cesia*, Meig., *stabulans*, Fall., *Drosophila flaveola*, Meig., and *Parydra* sp., fig. 33. The figures illustrate details, pupæ, &c.

KIRBY, W. F. Notes on the *Diptera* of New Zealand. *C. septentrionalis*, Hutton's last Catalogue of 1881. Tr. Canada in 1883; W. Saunders,

With the additions and corrections in *tl. onobrochydus*, *Bremi* (nec Löw), to 123. A few notes by Osten-Sacken a same species: Mik, Wien. ent. Z. New Zealand, cf. also Osten-Sacken, N. Z. and antenna of ♀). *C. salicis*, 96, 97, & 206.

15 species noticed, 3 new.

Includes tables of genera, and of the species of *Dolichopodidæ*; *Dolichopus melanopus*, Meig., is a good species; *D. apicalis*, Zett., is a true *Dolichopus*, and not a *Gymnopternus*; *D. notabilis* and *puncticornis*, Zett., may be synonymous.

* MEINERT, F. Munddelenes Bygning hos Fluerne (*Diptera*). Förh. vid 12te Skand. Naturforskaremötet i Stockholm, 1880 (Stockholm: 1883), pp. 523-526.

OSTEN-SACKEN, C. R. Facts concerning the Importation or Non-importation of *Diptera* into Distant Countries. Tr. E. Soc. 1884, pp. 489-496.

—, An Essay on Comparative Chaetotaxy, or the arrangement of characteristic bristles of *Diptera*. *T. c.* pp. 497-517, woodcut.

A revised reissue of papers published in MT. Münch. ent. Ver. v. pp. 131-138, and Wien. ent. Z. 1882, p. 91 ; with some remarks on a paper by Mik in Verh. z.-b. Wien, 1882.

—, Berichtigungen und Zusätze zum Verzeichnisse der entomologischen Schriften von Camillo Rondani. Verh. z.-b. Wien, xxxiv. pp. 117 & 118.

—, List of the *Diptera* of the Island of Madeira, so far as they are mentioned in Entomological literature. Ent. M. M. xxi. pp. 32-34.
53 species enumerated.

ROMBOUTS, J. E. Über die Fortbewegung der Fliegen an glatten Flächen.
Zool. Anz. vii, pp. 619-623. [Cf. also Zool. Rec. xx. *Ins.* p. 236.]

Lee's paper on the chordotonal organs of Dipterous larvæ (Arch. mikr.
 v. *Ins.* p. 236) has been republished in French

MANSON, P. The Metamorphosis of the Mosquito. Tr. L.S. (2) ii. 685-689, pl., and Bull. Ent. Res. xvi.
Out of 3 or 4 species of mosquitoes, &c., discussed; Nature, xxxi. pp. 29.
appears suited to the development.

Flies destroyed by fungus; Leidy, P. Ac. Philad. 1884, p. 302, and Ann. N. H. (5) xiii. pp. 306 & 307.

Grassi's observations on dangers from flies noticed; Am. Nat. xviii. pp. 1267 & 1268, and Nature, xxix. pp. 482 & 483.

A living fly pairing with a dead one; Dewitz, Ent. Nachr. x. p. 286.

Dead flies adhering to glass; *id. t. c.* pp. 286 & 287.

Remarkable larva, supposed to be Dipterous, described; White & Parsons, J. Quek. Club (2) i. p. 316.

Wasps killing flies, and flies coming to the rescue of their companions; Nature, xxx. pp. 385, 407, 408, 490, & 539.

Marine aquatic Dipterous larva from New Jersey described; Packard, Am. Nat. xviii. pp. 826-828, fig. 1.

On examining *Diptera* under the microscope; Slack, Knowledge, vi. pp. 312 & 313, figs.

On the collection and preservation of do.; Williston, Psyche, iv. pp. 130-132, and N. Z. J. Sci. ii. pp. 295 & 296.

Various new or rare British do. noticed by Dale, Ent. M. M. xx. p. 214.

List of do. captured in the Jura; Riggenbach-Stehlin, MT. schw. ent. Ges. vii. p. 48. In Courland and Livonia; Sintenis, SB. Ges. Dorp. vii. pp. 2-14. In Sardinia; Von Röder, Wien. ent. Z. iii. pp. 40-42. Collected in Spain and Mallorca; *id.* Ent. Nachr. x. pp. 253-257. In Khar-koff (additions); Jaroscheffski, * Trud. Khark. xiii., xvi., & xvii. (*cf.* Osten-Sacken, Wien. ent. Z. iii. pp. 284 & 285). Collected near Montreal; Caulfield, Canad. Ent. xvi. pp. 136-139.

CECIDOMYIIDÆ.

MÜLLER, F. Fühler mit Reisswerkzeugen bei Mückengruppen. Kosmos, xv. pp. 300-302, figs.

The writer has observed small galls on the leaves of a *Paullinia*, containing the larvæ or pupæ of a gall-gnat; the pupæ are provided with peculiar antennary processes in order to open the gall.

SCHLECHTENDAL, D. Ueber Cecidien. *JB. Ver. Zwickau, 1883, pp. 1-17, pl. (*Cf.* Mik, Wien. ent. Z. iii. pp. 317 & 318.)

Note on *Cecidomyiidae* bred from galls on *Cattleya*; P. E. Soc. 1884, p. xxii.

Cecidomyia destructor, Say (Hessian Fly): notes on its appearance in 1883; Claypole, P. Am. Ass. xxxii. p. 321, and W. Saunders, Canad. Ent. xvi. p. 207: seasons of its attacks; Riley, Am. Nat. xviii. pp. 194 & 195: ravages in Hungary; Lipovniczky, Rov. Lapok, i. pp. 231, 232, & xxix. *C. carbonifera*, Ost.-Sack.: the larva produces galls on *Solidago*; other undetermined Cecidomyid larvæ on fungi, *Solidago*, and *Aster* are likewise discussed; Trelease, Psyche, iv. pp. 195-200. *C. leucomela*, Lintn. (Clover seed Midge): ravages in *C. leucomela* described; Engel, Rep. E. Soc. Ont. 1883, pp. 11 & 12. *C. penns.* (all White, MS.), p. 271, discussed; *C. giraudi*, Frauenf., is the *aland.* iii. pp. 215-217, figs. 1 & 2 (abdomen). *C. gutina* (= *incunctana*, ♀, Walk.), Schrank, noticed; Ent. Tidskr. v. pp. Leyd. Mus. vi. pp. 254 & 256.

Cecidomyia braueri, Handlirsch, Verh. z.-b. Wien, xxxiv. p. 135, pl. v. figs. 1-8, Moravia; *C. ignorata*, Wachtl (= *onobrychidis*, Löw, nec Bremi, and *medicaginis*, Bremi), Wien. ent. Z. iii. pp. 163-166, Austria: spp. nn.

Clinorhyncha millefolii, sp. n., *id. t. c.* p. 161, pl. ii. figs. 3-5, Austria, Moravia.

Diplosis (?) *grassator*, sp. n., Fyles, Rep. E. Soc. Ont. 1883, p. 30, fig. 9, Canada (parasitic on *Phylloxera*).

MYCETOPHILIDÆ.

Polylepta leptogaster, Winn. Specimen with abnormal neurulation described; De Man, Tijdschr. Ent. xxvii. pp. 137-139, pl. vii. figs. 1 & 2.

Sciara sp. Larva noticed and figured; Forbes, Rep. Ins. Illin. xiii. pp. 57-59, pl. iv. figs. 5-9. Species from Guinea noticed; Van der Wulp, C.R. ent. Belg. xxviii. p. cclxxxviii.

Docosia morionella, sp. n., Mik, Verh. z.-b. Wien, xxxiii. p. 251, Austria.

Mycetophila xanthotricha and *adumbrata*, spp. nn., *id.* Wien. ent. Z. iii. p. 81, Lower Austria.

Sciara conica, p. 246, *sznablii*, p. 247, *interdicta*, *interstincta*, p. 248, *dziejickii*, p. 249, *cinerascens*, p. 250, *mikii*, p. 251, *leta*, p. 252, *kowarzii*, p. 253, *nowickii*, p. 254, *vulpina*, *colorata*, p. 255, *satjata*, p. 256, *ardua*, p. 257, *angusta*, p. 258, *confusa*, *svavis*, p. 259, *aspirans*, p. 260, *difficilis*, p. 261, *electa*, p. 262, *rufa* and *fugax*, p. 263, spp. nn., Grzegorzec, B. E. Z. xxviii., Galicia.

SIMULIIDÆ.

Simulia columbacensis, Schönb.: natural history; Horváth, Rov. Lpok, i. pp. 195-204 & xxv.-xxvii. pl. iii: respiratory organs of pupa described; Tömösvary, *t. c.* pp. 34, 37, v. & vi. fig. 8. *S. reptans*, Latr., and *maculata*, Meig., destructive to cattle; Ent. Nachr. x. pp. 234 & 235.

Simulium indicum, sp. n., Becher, P. A. S. B. 1884, pp. 161-163, Assam (dangerous to men and cattle; called "Peepsa" by the natives, and supposed to be the same as the "Peto" of the N.W. Frontier).

BIBIONIDÆ.

Bibio (Hirtea) pomona, Fabr. Abundance in Sweden in 1883; Schöyen, Ent. Tidskr. v. pp. 86 & 87.

Dilophus humeralis, Zett., briefly redescribed; Von Röder, Ent. Nachr. x. p. 257. *D. nigrostigma* and *zealandicus* (= *spectabilis*, Now.), noticed; Kirby & Osten-Sacken, Tr. E. Soc. 1884, p. 272.

Bibio rubicundus, sp. n., Van der Wulp, Notes Leyd. Mus. vi. p. 251, Java.

Plecia tristis, sp. n., *id. ibid.*, Java.

Sciara, Walb.,
xxviii. p. 174.

CULICIDÆ.

Ptiolina nigripes, Zett. Transis of *Filaria sanguinis-hominis* in the

Leptis cinerascens, sp. n., Vpp. 367-388, pl. xxxix.

squito observed in Hong-Kong, only 1

Sardinia.

Suragina elegans, sp. n., Karsch, of *Filaria*.

Habits of mosquitos; Bonavia, Gard. Chron. (2), xxii. pp. 171 & 172.

Columns of gnats streaking the sky; Magis, Feuille. Nat. xiv. p. 147.

Culex. Male drinking; Dimmock, Psyche, iv. p. 147. *C. pipiens*, Linn., a nurse for *Filaria sanguinis-hominis* in Egypt; Sonsino, *P.-v. Soc. Tosc. 6 juillet, 1884, p. 102 (cf. Arch. Ital. Biol. vi. p. 110).

Megarhina christophi, sp. n., Portschinsky, Hor. Ent. Ross. xviii. p. 122, Amur.

Anopheles barbirostris and *annularis*, spp. nn., Van der Wulp, Notes Leyd. Mus. vi. pp. 248 & 249, Java.

CHIRONOMIDÆ.

BALBIANI, E. G. Sur la structure du noyau des cellules salivaires chez les larves de *Chironomus*. Rev. Montp. (3) i. pp. 354-356. [Cf. also Zool. Rec. xviii. *Ins.* p. 238.]

KORSCHULT, E. Über die eigenthümlichen Bildungen in den Zellkernen der Speicheldrüsen von *Chironomus plumosus*. Zool. Anz. vii. pp. 189-194, 221-225, & 241-246, figs.

Chironomus latus, Meig., discussed, and ♀ described; Mik, Wien. ent. Z. iii. pp. 201-203.

Tanyptus cruz, Wied. (= *pardalis* and *ornatus*, Dol.), discussed; Van der Wulp, Notes Leyd. Mus. vi. p. 250.

Thalassomyia congregata, sp. n., Tömösvary, Term. füzetek, vii. [1883], pp. 19 & 20, S. Hungary. (Eggs devoured by dogs; *id.* Rov. Lapok, i. pp. 83, 84, & xi., and Wien. ent. Z. iii. pp. 223 & 318.)

TIPULIDÆ.

Tipula oleracea and *Pachyrhina pratensis*, Linn. Ravages noticed; Karsch, Ent. Nachr. x. pp. 190-194.

Tipula oleracea, Linn., and *dilatata*, Schumm., and *Limnophila hyalinennis*, Zett., and *nemoralis*, Meig., differentiated, and fully described; Behling, Wien. ent. Z. iii. pp. 229-238.

Limnobia vormanni, *Dicranomyia osten-sackeni*, and *Trichosticha kolbei*, Westhoff. Descriptions reprinted; Ent. Nachr. x. pp. 263 & 264.

Trochobola casarea, Ost.-Sack. Pupa described in both sexes; Mik, Wien. ent. Z. iii. pp. 65-67, pl. i. figs. 1-5.

Tipula. Microscopic observations; Slack, Knowledge, vi. pp. 396-398, figs. *T. senex*, White & Butl. (= *novara*, Schin.), and *viridis*, Walk. (? = *holochlora*, Now.), noticed; Kirby & Osten-Sacken, Tr. E. Soc. 1884, pp. 270 & 272.

Ctenophora. 16 species tabulated, and *C. compedita*, Wied., *javanica*, Dol., and *incunctana*, Walk., redescribed; Van der Wulp, Notes Leyd. Mus. vi. pp. 253-256. *C. pectinicornis*, Linn.; *viridula* described, Engel, Ent. Nachr. x. pp. 259 & 260.

Tipula dux, p. 270, *clara* and *obscuripennis* (all White, MS.), p. 271, spp. nn., Kirby, Tr. E. Soc. 1884, New Zealand.

Ctenophora curvipes, Gorontalo, and *velutina* (= *incunctana*, ♀, Walk.), Celebes, spp. nn., Van der Wulp, Notes Leyd. Mus. vi. pp. 254 & 256.

DIXIDÆ.

Dixa maculata, Meig. (? = *puberula*, Löw.). Transformations described and larva figured, and larva of *D. æstivalis*, Meig., more briefly noticed; Gercke, Wien. ent. Z. iii. pp. 166-171.

RHYPHIDÆ.

Rhyphus neozelandicus, Schin., noticed; Kirby & Osten-Sacken, P. E. Soc. 1884, pp. 269 & 270.

STRATIOMYIDÆ.

Odontomyia triteniata, Bell., noticed; Van der Wulp. C.R. ent. Belg. xxviii. p. cclxxxix.

Amphilecta superba, Brauer, is a Brazilian species; Karsch, B. E. Z. xxviii. p. 171.

Cyrtopus, g. n., Bigot, Bull. Soc. Ent. Fr. (6) iii. p. xcvi. Allied to *Odontomyia*. Type, *C. fastuosus*, sp. n., *ibid.*, Abyssinia.

TABANIDÆ.

Pangonia zigzag, Macq., is from Madagascar; Karsch, B. E. Z. xxviii. pp. 171 & 172.

Philoliche (?) (*Pangonia*) *neocaledonica*, Mégnin, redescribed in full; Bigot, Bull. Soc. Ent. Fr. (6) iii. pp. cxxxviii.-cxl.

Chrysops geminatus, Wied. and Macq., differentiated, and the latter re-named *crassicornis*; Van der Wulp, Wien. ent. Z. iii. pp. 139-141, and C.R. ent. Belg. xxviii. p. cclxxxix.

Hexatoma pellucens, Fabr. Transformations described; Brauer, Denk. Ak. Wien, xlvii. pp. 42 & 43.

Tabanus gigas, Herbst, *tricolor*, Zell., and *carabaghensis*, Portsch., discussed, and the last redescribed; Portschinsky, Hor. Ent. Ross. xviii. pp. 123-127.

Chrysops aterrimus, sp. n., Kirby, Ann. N. H. (5) xiii. p. 457, Japan. (Probably = *japonicus*, Wied.; cf. Osten-Sacken, Wien. ent. Z. iii. p. 316.)

LEPTIDÆ.

Vermileo degeeri, Schin. Transformations described; Brauer, Denk. Ak. Wien, xlvii. pp. 43 & 44.

Stenobothrus *Walsbyi*, differentiated from *Atherix*, Meig.; Karsch, B. E. Z. xxviii. p. 174.

Ptiolina nigripes, Zett. Transformations described; Brauer, *t. c.* p. 43.

Leptis cinerascens, sp. n., Von Röder, Wien. ent. Z. iii. p. 41,

Sardinia.

Suragina elegans, sp. n., Karsch, B. E. Z. xxviii. p. 174, Ceylon.

ASILIDÆ.

WILLISTON, S. W. On the North American *Asilidæ* (*Dasyopogoninae*, *Laphrinæ*), with a new genus of *Syrphidæ*. Tr. Am. Ent. Soc. xi. pp. 1-35, pls. i. & ii. (details).

Contains a table of genera occurring north of Mexico, notes on various known species, and descriptions of new ones. The most important known species noticed are as follows:—*Myelaphus melas*, Big., figs. 1 & 1a, and *lobicornis*, Ost.-Sack., *Ceraturgus cruciatus*, Say, fig. 2, *Laphystia 6-fasciata*, Say (= *Triclis notata*, Big.), *Habropogon*, Loew, *Dicolonus simplex*, Loew, fig. 4, *Ospricerus æacus*, Wied., figs. 5 & 5a, *Cyrtopogon* (several undetermined species, 2 illustrated), figs. 10 & 11, pl. i., *Pycnopogon cirrhatus*, Ost.-Sack., *Anisopogon senilis*, Bigot, and *lautus*, Loew, *Nicocles*, Jaenn., *Lestomyia sabulonum*, Ost.-Sack., pl. ii. fig. 4, *Taracticus 8-punctatus*, Say (♀ described), pl. ii. figs. 2 & 2a, *Saropogon combustus* and *adustus*, Loew, *Deromyia winthemi*, Wied. (? = *angustiventris*, Macq., and *Diogmites misellus*, Loew), pl. ii. fig. 6, *D. umbrina*, Loew (= *Dasyopogon basalis* and *herennius*, Walk.), *Laparus* (?) *pictitarsis*, Big., *Dasyllis sacrator*, Walk., *astur*, Ost.-Sack. & c., *Laphria gilva*, Linn. (= *rufus*, De Geer), *Laphria bilineata*, Walk., *franciscana*, Big., *Lampria bicolor*, Wiedem. (= *megacera*, Macq., *antæa*, Walk., and ? *saniosa*, Say), *Microstylum galactodes*, Loew, fig. 7, *Callinicus calcaneum*, Loew, fig. 12, *Nicocles politus*, Say, fig. 13, *dives*, Loew, fig. 16, pl. i., *Lestomyia* sp. n., pl. ii. fig. 5, *Atomosia puella*, Wied., fig. 8, *Pogonosoma dorsata*, Say, fig. 9, *Asilus sericeus*, Say, fig. 10, *Mallophora laphroides*, Wied., fig. 11, *Ommatius tibialis*, Say, fig. 12, *Protocanthus heros*, Wied., fig. 13, *Promachus* sp. n., fig. 14, pl. ii.

Leptogaster flavipes, Loew, ♂ described, and *Deromyia winthemi*, Wied., and *basalis*, Walk. (= *Diogmites bilineatus*, Löw), noticed; Van der Wulp, Tidschr. Ent. xxvii. pp. 207 & 208.

Microstylum, Macq., may be divided into two sections: in the first, comprising the bulk of the species, the intermediate tibiæ are unarmed; and in the second, comprising 2 new species from Madagascar, and *Dasyopogon dux*, Wied., from China and Java, the intermediate tibiæ are armed with a strong terminal spur, generally spined: Karsch, B. E. Z. xxviii. p. 172.

Cyrtopogon oculiferum, Bigot, = *meyer-duerii*, Mik; Von Röder, Wien. ent. Z. iii. p. 291.

Saropogon scutellaris, Meig., and allies, noticed; *id.* Ent. Nachr. x. p. 254.

Laphria flava, Linn. Var. (?) from the Simplon noticed; Bigot, Bull. Soc. Ent. Fr. (6) iv. p. cxv.

Rhadiurgus variabilis, Zett., noticed; Karsch, Ent. Nachr. x. pp. 196 & 197.

New species :—

Myelaphus rufus, Williston, Tr. Am. Ent. Soc. xi. p. 7, California.

Dioctria nitida, pl. i. fig. 3, and *sackeni*, *id.* t. c. p. 8, Washington

Territory; *D. concinna*, Costa, Bull. Ent. Ital. xv. p. 339, Sardinia; *D. flavicincta*, Von Röder, Ent. Nachr. x. p. 253, Spain (Ibiza) and Mallorca.

Dasyopogon diversipes, Kirby, Ann. N. H. (5) xiii. p. 458, Sydney. (Probably = *diversicolor*, Macq.; Osten-Sacken, Wien. ent. Z. iii. p. 316.)

Microstylum radamæ and *radabæ*, Karsch, B. E. Z. xxviii. p. 172, Madagascar.

Cyrtopogon oculiferum and *montanum*, Bigot, Bull. Soc. Ent. Fr. (6) iv. p. cxv., Simplon.

Triclis tagax, Williston, t. c. p. 9, pl. i. fig. 6 & 6a, California.

Habropogon bilineatus, id. t. c. p. 11, pl. i. fig. 8, N. California.

Cyrtopogon dasylloides, p. 11, *præpes*, Washington Territory, p. 12, *dubius*, Oregon, p. 13, and *C. (?) gibber*, pl. i. fig. 2, California, p. 14, id. t. c.

Nicocles abdominalis, figs. 14 & 14a, b, California, p. 17, *rufus*, fig. 15, pl. i. p. 18, and *N. (?) scitulus*, pl. ii. figs. 1 & 1a, Washington Territory, p. 19, id. t. c.

Lestomyia fraudiger, id. t. c. p. 21, pl. ii. fig. 5, California.

Taracticus brevicornis, id. t. c. p. 22, pl. ii. fig. 3, Washington Territory.

Dasyllis unicolor, id. t. c. p. 26, Washington Territory.

Hyperochia atrox, id. t. c. p. 28, pl. ii. figs. 7 & 7a, b, Pennsylvania.

Laphria anthrax, California, *ferox*, p. 29, *vivax*, Washington Territory, p. 30, *canis*, Connecticut, *xanthippe*, Oregon, p. 31, and *pubescens*, Washington Territory, Oregon, p. 32, id. t. c.

Promachus floccosus, Kirby, Tr. E. Soc. 1884, p. 273, New Zealand.

Ommatius schlegelii, Van der Wulp, Notes Leyd. Mus. vi. p. 84, and Tijdschr. Ent. xxvii. pp. 140-142, pl. vii. figs. 3-12, Waigion.

Laparus oralis, id. C.R. ent. Belg. xxviii. p. cclxxxix., Guinea.

Maira lauta, id. t. c. p. ccxc., New Caledonia.

MIDAIDÆ.

Leptomydas fulviventris, sp. n., Bigot, Bull. Soc. Ent. Fr. (6) iv. p. lvi., Barka, E. Soudan.

NEMESTRINIDÆ.

Hirnoneura obscura, Meig. Transformations described and figured; the larva is parasitic on that of *Rhizotrogus solstitialis*, Linn.: Brauer, SB. Ak. Wien, lxxxviii. pp. 865-875, pl. i., and SB. z.-b. Wien, xxxix.

BOMBYLIIDÆ.

Anthrax erythrocephalus, Fabr., noticed; Sorensen, Ent. Tidskr. v. p. 18.

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Bombylius pictipennis, Loew, noticed from Sardinia; Von Röder, Wien. ent. Z. iii. p. 41.

Systoechus nitidulus, Fabr. (parasitic on *Orthoptera* of the genus *Stauronotus*). Transformations described; Chinkevitch, Hor. Ent. Ross. xviii. pp. 11-16.

Usia taeniolata, sp. n., Costa, Bull. Ent. Ital. xv. p. 339, Sardinia.

THEREVIDÆ.

Thereva bicinctella, sp. n., Costa, Bull. Ent. Ital. xv. p. 339, Sardinia.

EMPIDÆ.

Hilara lurida, Fall. Transformations described; Brauer, Denk. Ak. Wien, xlvii. pp. 44 & 45.

Dysaletria (*Tachypeza*) *atriceps*, Boh., = *melanocephala*, Loew (*nec* Boh.); Von Röder, Wien. ent. Z. iii. p. 291.

Empis anfractuosa, sp. n., Mik, Wien. ent. Z. iii. p. 4, Lower Austria.

Tachydromia nigricoxa and *eumelana*, spp. nn., *id. t. c.* p. 82, Lower Austria.

DOLICHOPODIDÆ.

Psilopus. East Indian species discussed, and 11 species (4 new) tabulated, and more or less fully noticed; Van der Wulp, Tijdschr. Ent. xxvii. pp. 217-228.

Dolichopus æneus, De Geer. Transformations described; Brauer, Denk. Ak. Wien, xlvii. p. 44.

Melanostolus, g. n., Kowarz, Wien. ent. Z. iii. pp. 51 & 107. Allied to *Diaphorus*; wings oval, eyes widely separated in ♀. Type, *D. melancholicus*, Loew.

Psilopus quadratus, Morotai & Halmadeira, p. 222, *obscuratus*, Padang, *pilosulus*, p. 226, and *filatus*, Java, p. 227, Van der Wulp, Tijdschr. Ent. xxvii., spp. nn.

Gymnopternus flavipes, sp. n., Von Röder, Wien. ent. Z. iii. p. 42, Sardinia.

Teuchoporus pectinifer, sp. n., Kowarz, Wien. ent. Z. iii. p. 111, Bohemia.

SYRPHIDÆ.

BIGOT, J. M. F. Diptères nouveaux ou peu connus. 22e-24e parties, xxxii. Syrphidi. 2e partie: Espèces Nouvelles, Na. 1er. Ann. Soc. Ent. Fr. (6) iii. pp. 315-356 & 535-560, and iv. pp. 73-116.

KÜNCKEL, J. Des mouvements du cœur chez les insectes pendant la métamorphose. C.R. xcix. pp. 161-163. (Cf. Ent. Nachr. x. pp. 216 & 217.)

In the pupa of *Eristalis* and *Volucella*, the heart pulsates during most of the time that the phenomena of histolysis and histogenesis are taking

place, but ceases to pulsate for the short period during which it is itself undergoing histological modification.

RITZEMA BOS, J. Mededeelingen omtrent de Narcisvlieg (*Merodon equestris*). Haarlem: 1884 (?), 8vo, pp. 23, 15 woodcuts.

VIALLANES, H. Sur un nouveau type de tissu elastique, observé chez la larve de l'*Eristalis*. C.R. xviii. pp. 1552 & 1553; translated, Ann. N. H. (5) xiv. pp. 151 & 152.

The retractile respiratory tube of the larva of *Eristalis* is shortened by special muscles, and by elastic bands lodged in its interior. Each of these elastic bands consists of a single cell constructed in such a way as to perform the part of a thread of india-rubber, each cell containing an elastic fibre (similar to those observed in the cervical ligament of a mammal, for example), which is coiled many times round the nucleus.

Note on the neuration of *Syrphidæ*; Bigot, Ann. Soc. Ent. Fr. (6) iii. p. 559.

Girschner, Wien. ent. Z. iii. pp. 197-200, pl. iii., describes the following Thuringian *Syrphidæ*:—*Syrphus arcuatus*, Fall., var. *bipunctatus* (fig. 1), *S. (Catabomba) pyrastris*, Linn., var. *flavoscutellatus*, and *S. letus*, Fabr., and notices the transformations (especially the pupa) of *Spilomyia (Caliprobola) speciosa*, Rossi (figs. 2 & 2a-c).

Captures of *Syrphidæ* near Philadelphia in the summer of 1884; Keen, Canad. Ent. xvi. pp. 145-147.

Molinia cærulea is a plant very attractive to *Syrphidæ*; they are sometimes found on it in large numbers, dying of the attacks of an *Entomophthora*, perhaps *E. muscæ*: Ludwig, Bot. Centralbl. xviii. pp. 122 & 123.

Cryptineura, Big., is a good genus, and *C. hieroglyphica*, Big., is not *Chrysogaster nitidus*, Wied., as supposed by Osten-Sacken; *Syrphus propinquus*, Macq., inhabits Nubia, not Tasmania; *Melanostoma mellina*, Schin., = *Syrphus gracilis*, Rond.: Bigot, Ann. Soc. Ent. Fr. (6) iii. pp. 315 & 316.

Microdon mutabilis and *devius*, Linn. Note on larvæ; Poujade, Bull. Soc. Ent. Fr. (6) iii. p. xcix. Transformations of the former described; Gadeau de Kerville, *Mél. ent. ii. pp. 7-12.

Pipiza radicum, Riley, noticed and figured; W. Saunders, Rep. Fruit-Grower's Ass. Ont. 1882, p. 270, fig. 5.

Syrphus sp. noticed and figured; *id. t. c.* p. 282, figs. 39 & 40. *S. ortas*, Walk.: habits and transformations described; Hudson, Ent. xvii. pp. 170 & 171. *S. ribesii*, Linn.: aberration; Jacobs, C.R. ent. Belg. xxviii. pp. cxxxvii. & cxxxviii.

* *Scæg. sordidus*, Stæg. Larva noticed; Malm, Förhandl. vid 12te Skand. Naturforsamling i Stockholm, 1880 (Stockholm: 1883), pp. 540-544.

Somula decora, Macq., noticed; Van der Wulp, Tijdschr. Ent. xxvii. p. 208.

Plagiocera hamorrhœa, Gerst., = *Dolichomerus nigratus*, Bigot; Karsch, B. E. Z. xxviii. p. 172.

New genera and species :—

Euceratomyia, Williston, Wien. ent. Z. iii. p. 185. *Allied to Eulicera*. Type, *E. pergandei*, sp. n., t. c. p. 186, Columbia. [Bigot states that this genus = *Merapioides*, Big., though the types are not identical; t. c. p. 217. Cf. also pp. 282 & 320, and Bull. Soc. Ent. Fr. (6) iv. pp. xcvii. & xcvi.]

Nausigaster, id. Tr. Am. Ent. Soc. xi. p. 33. Allied to *Paragus*. Type, *N. punctulata*, sp. n., t. c. p. 34, pl. ii. fig. 15, New Mexico.

Sphymorpha nigra, p. 317, *rufibasis*, Mexico, and *anchorata*, Sarawak, p. 318, Bigot, Ann. Soc. Ent. Fr. (6) iii.

Chrysotoxum villosulum, id. t. c. p. 323, Washington Territory.

Microdon opulentum, Brazil, p. 319, *cothurnatum*, Washington Territory, *marmoratum*, California, and *gracile*, Mexico, p. 320, id. t. c.

Salpingogaster anchoratus, p. 328, *cothurnatus*, Mexico, and *nigriventris*, Monte Video, p. 329, id. t. c.

Ascia nasuta, *quadrinotata*, p. 327, and *albipes*, p. 328, id. t. c., N. America.

Sphagina (P) *macropoda*, id. t. c. p. 331, Burmah.

Ocyptamus infuscatus, *fraternus*, Mexico, p. 324, *rufiventris*, Cuba, and *albimanus*, Chili, p. 325, id. t. c.; *O. fuscicolor*, id. op. cit. iv. p. 116, New Caledonia.

Spazigaster (Rond., = *Spatigaster*, Schin.) *bacchoides*, id. op. cit. iii. p. 326, Rocky Mountains.

Baccha punctum, Senegal, p. 332, *tricincta*, Washington Territory, *marmorata*, p. 333, *luctuosa*, Mexico, *apicalis*, Brazil, p. 334, *nigrifrons*, Chili, and *gratiosa*, Sarawak, p. 335, id. t. c.

Doros insularis, id. t. c. p. 330, Cuba.

Sphyxza fulvipes, Java, and *fulvifrons*, Georgia, id. t. c. pp. 340 & 341.

Doliosyrphus scutellatus, Panama, p. 342, *hirtipes*, p. 343, Panama, and *geniculatus*, Buenos Aires, id. t. c.

Eristalis nitidus, Van der Wulp, C.R. ent. Belg. xxviii. p. cexci., Java; *E. opulentus*, Bigot, t. c. p. 336, Cuba.

Eristalomyia calomera, S. America, p. 337, *laticornis*, p. 338, *quadri-oculata* and *caledonica*, New Caledonia, p. 339, id. t. c.

Merodon trochantericus and *rubidiventris*, Costa, Rend. Acc. Nap. xxiii. p. 173, Sardinia; *M. atripes*, Bigot, Bull. Soc. Ent. Fr. (6) iv. p. cxvi., Simplon.

Lepidomyia cincta, id. Ann. Soc. Ent. Fr. (6) iii. p. 345, Mexico.

Dolichogyna nigripes, id. t. c. p. 346, Chili.

Tigridiamyia pictipes, id. t. c. p. 348, Java.

Prionotomyia tarsata, id. *ibid.*, Senegal.

Eumerosyrphus indicus, id. t. c. p. 349, India.

Asemosyrphus bicolor, *oculiferus*, p. 350, *flavicornis*, id. pp. 351 and *nigroscutatus*, p. 351, id. t. c., Mexico.

Mesembrius ruficauda, id. t. c. p. 344, Australia.

Helophilus flavifacies, id. *ibid.*, Baltimore.

Kirinyia eristaloides, id. t. c. p. 347, Japan.

Didea fulvipes, id. Bull. Soc. Ent. Fr. (6) iv. p. cxvi., Simplon.

Romaleosyrphus villosus, id. Ann. Soc. Ent. Fr. (6) iii. p. 356, Mexico.

- Eumerus crassitarsis*, Costa, t. c. p. 173, Sardinia; *E. ruficauda*, Bigot, t. c. p. 539, Algeria.
- Brachypalpus morissoni*, id. t. c. p. 355, Washington Territory.
- Ortholophus notatus*, id. t. c. p. 535, Chili.
- Syritha rufifacies*, Pondicherry, and *mexicana*, Mexico, id. t. c. pp. 538 & 539.
- Spilomyia pallipes*, id. t. c. p. 352, Mexico.
- Calliprobola area*, p. 352, *calorhina*, Washington Territory, p. 353, and *pictipes*, Carolina, p. 354, id. t. c.
- Xylota cærulifrons*, locality unknown, p. 542, *calopus*, Java, *rubbiginigaster* [sic], p. 543, *coloradensis*, p. 544, *metallifera*, Colorado, *annulifera*, N. America, p. 545, *satanica*, *flavitibia*, California, p. 546, and *bivittata*, Chili, p. 547, id. t. c.
- Brachyopa cinereo-vittata*, id. t. c. p. 537, California.
- Myolepta fairmairii*, French Alps, and *lunulata*, N. America (Mount Hood), id. t. c. pp. 536 & 537.
- Graptomyza vittigera*, Natal, and *atripes*, Moluccas, id. t. c. p. 321.
- Ptilostylomyia triangulifera*, id. t. c. p. 322, Sierra Leone.
- Volucella nigropicta*, Portschinsky, Hor. Ent. Ross. xviii. p. 127, Amur.
- Temnocera* (?) *fulvicornis*, Buenos Aires, and *T.* (?) *andicola*, Chili, Bigot, t. c. pp. 547 & 548.
- Glaurotricha* (?) *volucelloides*, id. t. c. p. 548, Mexico.
- Endiasimyia indiana*, id. t. c. p. 549, India.
- Ischyrosyrphus tricolor*, id. op. cit. iv. p. 73, California.
- Triglyphus fulvicornis*, id. op. cit. iii. p. 558, Australia.
- Paragus latecinctus*, Sierra Leone, *auricaudatus*, California, p. 540, *ruficaudatus*, Brazil, and *P.* (?) *pachypus*, Sydney, p. 541, id. t. c.
- Pipiza crassipes*, id. t. c. p. 557, N. America.
- Penium dubium*, id. ibid., Chili.
- Patycheirus ciliatus*, id. op. cit. iv. p. 74, California.
- Syrphus trilineatus*, p. 86, *erythropygus*, [East ?] Indies, *berber*, p. 87, *rufinasutus*, Morocco, p. 88, *pfeifferi*, Mauritius, Bourbon, *maculifrons*, Mount Hood, p. 89, *perpallidus*, N. America, p. 90, *quinguelimbatus*, California, *eupeltatus*, p. 91, *agilis*, Mexico, p. 92, *pallipes*, Chili, *pallidus*, p. 93, *jacksoni*, Australia, p. 94, *canaqueus*, p. 95, *ruficauda*, p. 96, *melanurus* and *noumeæ*, New Caledonia, p. 97, id. t. c.
- Mesograpta* (?) *saphiridiceps*, M. (?) *mu*, p. 105, M. (?) *pallipes*, p. 106, M. (?) *circumduta*, Mexico, p. 107, M. (?) *lucrymosa*, Brazil, Mexico, p. 108, M. (?) *heraldica*, M. (?) *trilobata*, p. 109, M. (?) *bistriga*, Mexico, p. 110, M. (?) *maculata*, Mexico, Cuba, Brazil, p. 111, M. (?) *bicincta*, Mexico, M. (?) *jaguarina*, p. 112, M. (?) *maculipes*, Brazil, p. 113, M. (?) *cuprina*, Cuba, p. 114, M. (?) *quinquevittata*, and M. (?) *pallida*, New Caledonia, p. 115, id. t. c.
- Syrphophora* [East ?] Indies, *pyrrura*, Senegal, p. 99, *borbonica*, Bourbon, p. 100, *pyrrhina* and *dubia*, California, p. 101, *rostrata*, *picticauda*, p. 102, *nasuta*, p. 103, *pachypyga* and *fulvicauda*, Mexico, p. 104, id. t. c.
- Melanostoma* (?) *octonotata*, Algeria, p. 75, M. (?) *parhyalinata*, Madeira, M. (?) *annulata*, Sierra Leone, p. 76, M. (?) *mauritiana*, Mauritius,

M. (?) *quadrinotata*, Mexico, p. 77, *M.* (?) *pictipes*, p. 78, *M.* (?) *pruinosa*, *M.* (?) *bicruciatata*, p. 79, *M.* (?) *rostrata*, *M.* (?) *pachytarsis*, California, p. 80, *M.* (?) *cruciata*, Mexico, p. 81, *M.* (?) *anthracoides*, Panama, *M.* (?) *eucrata*, Bogota, p. 82, *M.* (?) *ruficornis*, Australia, p. 83, *M.* (?) *annulifera*, Mexico, p. 84, *M.* (?) *cingulata*, Mysol, Moluccas, and *M.* (?) *apicalis*, New Caledonia, p. 85, Bigot, *t. c.*

Orthoneura sinuosa, Washington Territory, and *O.* (?) *annulifera*, Brazil, *id. op. cit.* iii. p. 556.

Cartosyrphus hirtiventris, *albibarbis*, p. 550, *castaneiventris*, Brussa, *pilipes*, India, p. 551, *lamprurus*, N. America, *hoodianus*, p. 552, *infumatus*, Mount Hood, N. America, *lævis*, Washington Territory, and *frontosus*, Mexico, p. 553, *id. t. c.*

Melanogaster (?) *rufipes*, N. America, and *M.* (?) *ochripes*, Mount Hood, N. America, *id. t. c.* pp. 554 & 555.

Chrysogaster (?) *notata*, *id. t. c.* p. 554, New Zealand.

CONOPIDÆ.

WILLISTON, S. W. North American *Conopidæ*: *Stylogaster*, *Dalmannia*, *Oncomyia*. Tr. Conn. Ac. vi. pp. 91-98.

The following species are fully described, in addition to 4 new ones:—*Stylogaster biannulata*, Say (= *Stylomyia confusa*, Westw., and ? *Conops stylatus*, Fabr.), *Dalmannia nigriceps*, *Oncomyia abbreviata* and *lovaria*, Loew.

Conops bulbinus, Walk., = *aureorufus*, Macq., = *aurosus*, Newm.; *C. costatus*, Fabr., and *segethi*, Rond. (= *costatus*, Schin.), differentiated: Von Röder, Wien. ent. Z. iii. pp. 292 & 293 (cf. also Van der Wulp, Tidschr. Ent. xxvii. p. xviii. *C. vitellina*, Loew, and *quadrifasciatus*, Deg., differentiated; Mik, Wien. ent. Z. iii. p. 206.

Stylogaster neglecta, sp. n., Williston, *t. c.* p. 91, Connecticut.

Dalmannia picta, sp. n., *id. t. c.* p. 94, New Mexico.

Oncomyia modesta, Washington Territory, California, and *baroni*, California, Colorado, spp. nn., *id. t. c.* pp. 96 & 97.

ÆSTRIDÆ.

Cephalemyia maculata, Wied., *Æstrus purpureus*, Brauer, and *ovis*, Linn., discussed; Portschinsky, Hor. Ent. Ross. xviii. pp. 129-131.

Æstrus and *Dermatobia*. Larvæ infesting patients returned to Europe from America; Jacobs, C.R. ent. Belg. xxviii. p. cl. Laboulbène, Bull. Soc. Ent. Fr. (6) iii. p. xcii., and Jousseaume, Bull. Soc. Z. Fr. ix. pp. 114-116.

Hypoderma bovis, Linn. Mischief caused by it to hide; Oncomyia and others, P. E. Soc. 1884, p. xxi.

Gastrophilus pallens, sp. n., Bigot, Bull. Soc. Ent. Fr. (6) iv. p. lviii. Suakin (?).

Hypoderma albofasciata, sp. n. [sic; recte, *albofasciata*], Portschinsky, Hor. Ent. Ross. xviii. p. 128, Amur.

TACHINIDÆ.

Microcephalus neugebaueri, Portsch., *Echinomyia maculosa*, Wied., ♀ and *Sarcotachina subcylindrica*, Portsch., ♀, noticed; Portschinsky, Hor. Ent. Ross. xviii. pp. 128, 131, & 132.

Alophora aurigera, Egger. Sexes and anatomy described; the following names are synonyms:—*Hyalomyia bonapartei*, Rond., *H. helleri*, Palm., *Alophora krieckbaumeri*, Schin., and *Phasia urnifera*, Roser. (?): Laboulbène, Ann. Soc. Ent. Fr. (6) iv. pp. 17–27, pl. i. figs. 5 & 6.

Apostrophus anthophilus, Loew. Amended description; Von Röder, Ent. Nachr. x. p. 255.

Tachina sp. Larvæ infesting the tracheal system of the imagines of *Carabus cancellatus* and *glomeratus*; Cholodkowsky, Zool. Anz. vii. pp. 316–319, and Ann. N. H. (5) xiv. pp. 74–76.

Tachina sp. noticed and figured; W. Saunders, Rep. Fruit-Growers' Ass. Ont. 1882, p. 282, fig. 38: parasitic upon larvæ of *Selandria barda*, Say; Osborne, Canad. Ent. xvi. p. 151. *T. zelica*, Walk., = *lupina*, Swed.: Kirby, Tr. E. Soc. 1884, p. 274.

Miltogramma sp. parasitic in the burrows of *Dasypodu hirtipes*; Müller, Verh. Ver. Rheinl. xli. pp. 16–20.

Udschimyia sericaria, Rond. (destructive to silkworms in Japan). Life-history; Sasaki, Nature, xxx. pp. 435 & 436.

New genera and species:—

Ancylogaster, Bigot, Bull. Soc. Ent. Fr. (6) iv. p. lxix. Allied to *Uromyia*. Type, *A. armatus*, sp. n., t. c. p. lxx., Mexico.

Sphyromyia, id. t. c. iii. p. cviii. Allied to *Echinomyia*. Type, *S. malleola*, sp. n., t. c. p. cix., California.

Hystricia cyaneiventris, Van der Wulp, C.R. ent. Belg. xxviii. p. ccxci., Guanajuato.

Echinomyia tricondyla, Costa, Bull. Ent. Ital. xv. p. 339, Sardinia; *E. micado*, Kirby, Ann. N. H. (5) xiii. p. 459, Japan.

Exorista tamara, Portschinsky, Hor. Ent. Ross. xviii. p. 132, Transcaucasia.

Leskia tricolor, Mik, Verh. z.-b. Wien, xxxiii. p. 257, figs. 1–3 (details), Lower Austria.

Fabricia magnifica, id. t. c. p. 260, fig. 4 (antenna), Carinthia.

Scopolia sequax, Williston, Cook's Pract. Ent. p. 5, figs. 6 & 7 (details). Parasitic on *Agrotis fennica*, Tausch., Michigan.

DEXIDÆ.

Phorostoma latum, Egger (= *pectinata*, Schin.; ? = *Dexia pectinata*, Meig.). Transformations described; the larva is parasitic on that of *Rhizotrogus stitialis*, Portsch., SB. Ak. Wien, lxxxviii. pp. 875–877, pl. ii.

Cholomyia, g. n., Bigot, Bull. Soc. Ent. Fr. (6) iv. p. xxxvii. *Dexidæ*. Type, *C. inaquipes*, sp. n., t. c., Mexico.

Semitachina, g. n., Portschinsky, Hor. Ent. Ross. xviii. p. 133. Allied to *Oplisa* and *Tricogena*, Rond. Type, *S. hylemyieformis*, sp. n., t. c., Transcaucasia.

SARCOPHAGIDÆ.

PORTSCHINSKY, J. *Sarcophilæ wohlfahrti monographia*. Hor. Ent. Ross. xviii. pp. 247-314, woodcuts.

An important paper on medical Entomology, but entirely in Russian. The figures represent the insect in various stages; details, &c., and supplementary notices are added on *Sarcophila meigeni*, Schin. (= *ruralis*, Meig.), *S. latifrons*, Fall., and *Sarcophaga ruralis*, Fall.

Sarcophaga magnifica, Schin. (= *Sarcophila wohlfahrti*, Portsch.). Observations on myiasis caused by this fly, which is redescribed and figured; Laboulbène, Ann. Soc. Ent. Fr. (6) iv. pp. xcii. & 28-44, pl. i. fig. 7.

Onesia polita, sp. n., Mik, Verh. z.-b. Wien, xxxiii. p. 255, Lower Austria.

MUSCIDÆ.

SCHOCH, G. Die Tsetsefliege Afrikas. MT. schw. ent. Ges. vi. pp. 685 & 686.

Two similar flies are confounded under the name of Tsetse. The symptoms do not point to an animal poison, and the flies probably convey some miasmatic influence.

Notes on the proboscis of the Blow-Fly; Wright and others, J. R. Microsc. Soc. (2) iv. pp. 1003 & 1004.

Musca violacea, Walk., and *Calliphora auronotata*, Walk., = *Calliphora quadrimaculata*, Swed., and *hortona*, Walk., respectively; Kirby, Tr. E. Soc. 1884, p. 275.

Abstract of Kræpelin's paper on the proboscis of *Musca* [cf. Zool. Rec. xx. *Ins.* p. 248]; Am. Nat. xviii. pp. 1234-1244, figs.

Glossina [Tsetse]. Notices by various writers discussed and criticised, with short appended bibliography; Van der Wulp, Tijdschr. Ent. xxvii. pp. xci., xcii., & 143-150.

Hæmatobia ferox, Desv., = *Stomoxys melanogaster*, Meig.; Von Röder, Wien. ent. Z. iii. p. 293.

Compsonymia (*Lucilia*) *macellaria*, Fabr. Some of the cases of myiasis attributed to this species are probably due to the attacks of other species as well; Bigot, Bull. Soc. Ent. Fr. (6) iii. pp. cix. & cx. Arribalzaga's account translated; Williston, Psyche, iv. pp. 112-114.

Cyrtoneura stabulans, Fall. Larvæ ejected by a patient suffering from bronchitis; Laboulbène, Bull. Soc. Ent. Fr. (6) iii. pp. lxxxix.-xcii.

Tricyclea, g. n., Van der Wulp, C.R. ent. Belg. xxviii. p. ccxciii. Placed after *Calliphora*. Type, *T. ferruginea*, sp. n., t. c. p. ccxciv. figs., S. Africa.

Calliphora floccosa, sp. n., id. t. c. p. ccxcii., S. Africa.

ANTHOMYIDÆ.

Mydæa ancilla, Meig., noticed from Switzerland, and Zetterstedt's description quoted; Von Röder, MT. schw. ent. Ges. vi. pp. 687 & 688.

Anthomyia spinacia [? *betæ*, auct.] attacking beetroot in Scania; Nature, xxx. p. 494.

Hematomyia sp. destructive to colewort; specimen with 7 legs noticed; Billups, P. E. Soc. 1884, p. xxix.

Pegomyia bicolor, Wiedem., recorded as new to Canada, and redescribed; Fyles, Canad. Ent. xvi. pp. 69 & 70.

Spathipheromyia, g. n., Bigot, Bull. Soc. Ent. Fr. (6) iv. p. lxxxix. Allied to *Dialyta*; antennæ shorter, palpi short, nearly orbiculate, tibiæ with a few rather long bristles on the outer side; ♀ with oviduct small, soft, sulcidate. Type, *S. stellata*, sp. n., t. c., Chili.

CORDYLURIDÆ.

Scotophaga ostiorum, Hal., and *borealis*, Zett., = *oceanæ*, Macq.; Von Röder, Wien. ent. Z. iii. pp. 290 & 291.

Hydromyza tieffi, sp. n., Mik, Verh. z.-b. Wien, xxxiii. p. 252, Salzburg, Carinthia.

HELOMYZIDÆ.

Leria casia, Meig., attacked by a parasitic fungus; De Kerville, Bull. Soc. Ent. Fr. (6) iv. pp. xxviii. & xxix.

SCIOMYZIDÆ.

Limnia halensis, Loew, discussed; Mik, Wien. ent. Z. iii. pp. 203 & 204. *L. zelleri*, Loew, var. noticed from Mallorca; Von Röder, Ent. Nachr. x. p. 257.

ORTALIDÆ.

[Cf. also Trypetidæ.]

Epicausta, Löw. *Stonopterina femorata* and *immaculata*, Macq., from Bourbon, probably belong to this genus; Van der Wulp, C.R. ent. Belg. xxviii. p. cxcv., note.

Mikimyia, g. n., Bigot, Bull. Soc. Ent. Fr. (6) iv. p. xxix. *Ortalides*. Type, *M. furcifera*, sp. n., t. c. p. xxix., Brazil.

Epicausta metallica, S. Africa, and *nigra*, Zanzibar, spp. nn., Van der Wulp, C.R. ent. Belg. xxviii. p. cxcv.

PLATYSTOMIDÆ.

Platystoma pubescens, Loew, discussed; Mik, Wien. ent. Z. iii. pp. 204 & 205.

TRYPETIDÆ.

Trypeta injuriosa toasters; Sutter, JB. schles. Ges. lxi. pp. 316 & 317.

Trypeta alternata, Fall, probably not bred from *Impatiens*, as supposed by Hodgkinson; Fletcher, Ent. M. M. xx. p. 275.

Tephritis onopordinis, Curt. Celery maggot, discussed and figured; Gard. Chron. (2) xxii. pp. 406, 470, & 501. *T. tristis*, Loew: amended description; Von Röder, Ent. Nachr. x. pp. 255 & 256.

Dacus ferrugineus, Fabr. (= *Bactrocera maculipennis* and *conformis*, Dol.), noticed; Van der Wulp, C.R. ent. Belg. xxviii. p. ccxevi.

Rhachiptera, Bigot, may belong rather to the *Trypetidae* than to the *Ortalidae*; it may = *Percnoptera*, Phil., but is distinct from *Icaria*, Schin. *Pterocella*, Rond. (which belongs to the *Ortalidae*), and *Strobelia*, Rond.: a table of these four genera is added. Bigot, Bull. Soc. Ent. Fr. (6) iii. pp. lxxxviii. & lxxxix.; cf. also p. cxxix.

Icaria, Schin., is preoccupied in *Hymenoptera*, and should be renamed; André, Bull. Soc. Ent. Fr. (6) iii. p. xciv.

HETERONEURIDÆ.

Clusia flava, Meig., *Heterochroa picta*, Schin., and *Heteroneura pictipes*, Zett., noticed, and wings figured; Handlirsch, Verh. z.-b. Wien, xxxiv. pp. 140-142, pl. v. figs. 10-12.

Clusia milkii, sp. n., *id. t. c.* p. 137, pl. v. fig. 9, Moravia [= *C. (Heteroneura) decora*, Loew; Von Röder, Wien. ent. Z. iii. pp. 291 & 292].

CELYPHIDÆ.

Celyphus. Table of species in the Berlin Museum; Karsch, B. E. Z. xxviii. pp. 172 & 173.

Celyphus aurora, Java (?), *hyalinus*, *lucidus*, *cognatus*, *bigoti*, Ceylon, *signatus*, Bintang, and *anisotomoides*, Bengal, spp. nn., Karsch, B. E. Z. xxviii. p. 173.

Paracelyphus sumatrensis, sp. n., Van der Wulp, C.R. ent. Belg. xxviii. p. ccxevi., Sumatra.

EPHYDRIDÆ.

Ephydra californica, Pack. (?). Imago described and larva figured from the Soda Lakes of Nevada; the larvæ are cast up in vast quantities on the shore, and are used by the Indians for food; Williston, Tr. Conn. Ac. vi. pp. 87-90, woodcut.

DROSOPHILIDÆ.

Iulus surrounded by a swarm of small *Diptera* (*Drosophilidæ*?), probably attracted by the odour of the fluid secreted by its lateral glands; Lintner & Dimmock, Canad. Ent. xvi. pp. 80 & 100.

OSCINIDÆ.

Meromyza americana, Fitch. Life-history, ravages &c.; Forbes, Rep. Ins. Illin. xiii. pp. 13-29, pl. i. figs. 1-8.

Chlorops teniopus, Meig., and *Oscinis frit*, Linn. Ravages, parasites, &c., noticed; Larsson, Von Post, & Spångberg, Ent. Tidskr. v. pp. 53, 90, 203, 204, & 231.

Chlorops fuscipennis, sp. n., Costa, Bull. Ent. Ital. xv. p. 339, Sardinia.

PHYTOMYZIDÆ.

Phytomyza aquifolii, Goureau. Habits; Gadeau de Kerville, *Mél. ent. i. pp. 39 & 40.

HIPPOBOSCIDÆ.

Hippobosca sudanica, sp. n., Bigot, Bull. Soc. Ent. Fr. (6) iv. p. lix., Soudan.

(APHANIPTERA.)

PULICIDÆ.

KRAEPELIN, K. Ueber die systematische Stellung der Puliciden. Festschrift zum 50-jähr. Jubiläum des Realgymnasiums des Johanneums Hamburg. Hamburg: 1884, 4to, pp. 17, plate. [Cf. Wien. ent. Z. iii. p. 189; translated by Dallas, Ann. N. H. (5) xiv. pp. 36-54, pl. iii.]

The author discusses the various characters of the *Pulicidæ*, and regards them as more nearly related to the *Rhynchota* than the *Diptera*, although they cannot be properly classed with either Order. He divides the entire series of suctorial insects into two groups, the first, including *Hymenoptera* and *Lepidoptera*, being characterized by having the lower parts of the mouth, maxillæ, and labrum employed in the formation of a sucking apparatus; while in the second it is almost exclusively the upper parts (labrum and mandibles) that are implicated in the formation of the true food-canal. The second group includes the Orders *Diptera*, *Siphonaptera*, and *Rhynchota*. The name *Siphonaptera*, used by Latreille, is employed for the *Pulicidæ*, the more usual name, *Aphaniptera*, being rejected as inadmissible; and its characters are given as follows: "Insects with perfect metamorphosis. Head attached to the thorax by a wide surface; no faceted eyes. Buccal organs suctorial. Rostrum formed by a dorsal and two lateral channels (labrum and mandibles), its anterior section only more or less enclosed laterally by the multiarticulate terminal palpi of the labium, and at the base, besides the latter, by the lamelliform palpigerous maxillæ. Salivary efferent ducts paired, developed as a channel along the inner surface of the mandibles. No 'sucking stomach.' Thoracic segments free, without wings or halteres, with pleural processes upon the last two segments."

Description of the anatomy of the flea; Tyrrell, Tr. Ottawa Nat. Club, i. (1) pp. 86-90.

Fleas eaten by earwigs; Dimmock, Psyche, iv. p. 186.

Sarcopsylla penetrans, Westw. Schimkewitch describes the changes which take place in the abdomen of the ♀ after it has become parasitic; Zool. Anz. vii. pp. 673-676.

NEUROPTERA.

BY

ROBERT McLACHLAN, F.R.S., F.L.S., &c.

THE GENERAL SUBJECT.

BLACKBURN, T. Notes on Hawaiian *Neuroptera*, with descriptions of new species. Ann. N. H. (5) xiv. pp. 412-421.

Supplementary to McLachlan's papers [*cf.* Zool. Rec. xx. *Ins.* p. 252], with notes on the habits, &c., of some of the already described species.

BOLIVAR, IGNACIO. [Vide *Orthoptera*, The General Subject.]

COSTA, A. Nota intorno i Nevrotteri della Sardegna. Rend. Acc. Nap. xxiii. pp. 20 & 21.

Consists of diagnoses of 4 spp. nn., apparently in anticipation of the author's more extended notice of a second visit to Sardinia in 1883, which appears in Atti Acc. Nap. (2) i., where a list of all the species noticed is given, and the descriptions are also republished in the same memoir. [Of this latter a separate copy has alone been seen by the Recorder.]

KIRBY, W. F. On the *Neuroptera* collected during the recent Expedition of H.M.S. 'Challenger.' Ann. N. H. (5) xiii. pp. 453-456.

A list of 2 *Termitidæ*, 9 *Odonata* (1 new), and 1 *Myrmeleon*, from various localities.

KOLBE, H. J. *Neuroptera* aus Marocco, gesammelt von Herrn Prem.-Lieut. M. Quedenfelt. B. E. Z. xxviii. pp. 132-136.

A list of 3 *Odonata* and 4 *Myrmeleonidæ*, with remarks.

McLACHLAN, R. Recherches Névroptérologiques dans les Vosges. Rev. d'Ent. iii. pp. 9-20.

Enumerates the species collected during an excursion made in July, 1883, to the districts of Gérardmer, Retournemer, and Remiremont, and includes other species collected by Puton, &c., with notes. The list includes about 77 *Trichoptera*, 32 *Planipennia*, and 57 *Pseudo-Neuroptera*.

A list of species found in the vicinity of Bitche is given by J. J. Kieffer, Bull. Soc. Metz, xvi. (separate copy only seen), pp. 82-88.

TRICHOPTERA.

KING, J. J., and MORTON, KENNETH J. The *Trichoptera* of Scotland. Scot. Nat. (2) i. pp. 235-240 & 285-288.

Part of the "Insecta Scotica" series of lists. Preceded by general remarks. The list extends to the genus *Leptocerus*, according to McLachlan's arrangement.

KOLBE, H. J. Vorläufige Mittheilungen über ein neues, dem Gange der Naturschöpfung entlehntes, System der *Trichoptera*, nebst einem Hinweise auf die vermuthliche Abstammung der *Lepidoptera*. B. E. Z. xxviii. p. 186.

Calls attention to a special character in the neururation of the wings of *Leptoceridae*, *Sericostomatidae*, *Limnophilidae*, and *Phryganeidae*, not existing in the other families, and considers that the *Leptoceridae* were the earliest *Trichoptera*, and the *Lepidoptera* (e.g., certain *Tineina*, such as *Adela*, &c.) lead to them, and were derived from a common "Basis der Hauptstämme."

MCLACHLAN, R. A Monographic Revision and Synopsis of the *Trichoptera* of the European Fauna. First Additional Supplement. London: 1884, royal 8vo, pp. 1-76, pls. i.-vii.

Embodies the information received since the publication of the original work in 1880. Nearly 50 species are added (most of them here described for the first time), some genera are revised, and much additional local information is given. The plates are occupied by details, as before. The general plan of the original work is maintained. Reviewed (by Kolbe) in Ent. Nachr. x. pp. 212-214, and in Nature, xxx. p. 434.

— On a Small Collection of *Trichoptera* from Unst, North Shetland. Ent. M. M. xxi. p. 153.

A list of 12 species (cf. also t. c. p. 91). Small size and dark coloration are the prevailing characteristics.

— Notes on the Entomology of Portugal. VIII. *Trichoptera*. Ent. M. M. xxi. pp. 46-53.

A list of over 65 species collected by A. E. Eaton in 1880, with local and other information. The new species are described in the author's 1st Additional Supplement [vide *suprà*].

PATTEN, WILLIAM. The Development of Phryganids, with a preliminary Note on the Development of *Blatta germanica*. Q. J. Micr. Sci. (2) xxiv. pp. 549-602, pl. xxxvi. A, B, & C.

Observations on *Neophylax concinnus*, McLach., almost entirely embryological, excepting some introductory notes on the use of the gelatinous medium in which the eggs of *Trichoptera* are enveloped when deposited. The note on *Blatta* is very short (pp. 595 & 596).

SCHOCH, G. Ueber ein neues Phryganeengehäuse. MT. schw. ent. Ges. vii. pp. 50-52.

Concerns larvæ (which the author refers to *Philopotamus*) found in an aquarium, and in the Limmat, at Zürich, living in a horn-shaped, fine

net, attached at the mouth-end, which is about 4 cm. wide. The whole net is very long, and floats out in the stream. If the larvæ are deprived of their nets, they form new ones in the course of twenty-four hours. The larva is described.

WALLENGREN, H. D. J. Förteckning å de *Limnophilidæ*, *Apataniidæ*, och *Sericostomatidæ* som hittills blifvit Fauna på skandinaviska halfön. Ent. Tidskr. v. pp. 115-138.

A list of 78 species, with local remarks (no new species described). All but 7 belong to the *Limnophilidæ* as generally accepted; but a new family or subfamily, *Apataniidæ*, is indicated, which absorbs 4 species (*Apatania*), but no reasons for this subdivision are given. The sequence and nomenclature followed is usually that adopted by McLachlan, but with a few exceptions, and notably concerning certain Linnean species, into a discussion of which the author re-enters at length, in opposition to McLachlan and Hagen; the remarks occupy pp. 129-138, and a full translation in French is given at pp. 211-222. As a result of his arguments, the author maintains his former position, viz., that *Phryganea grisea*, L., is *Limnophilus stigma*, Curt. (the arguments occupying pp. 211-216); *P. bimaculata*, L., is *L. griseus*, auct.; and *P. flava*, L., is *L. centralis*, Curt. The paper is announced as preliminary to a monograph of Scandinavian *Trichoptera*.

Trichoptera attracted by the electric light; McLachlan, Ent. M. M. xxi. p. 91.

Notes on a few species from the Jura are given by F. Riggenbach-Stehlin, in MT. schw. ent. Ges. vii. p. 47.

Vosges. For list of species collected in part of this mountain chain, see McLachlan, Rev. d'Ent. iii. pp. 10-15. All the important information is reproduced by same author in his 1st Add. Suppl. [vide *suprà*].

Orthophlebia megalopolitana, Geinitz, Arch. Ver. Mecklenb. xxxvii. p. 31, pl. v. fig. 3, and *Phryganidium minium*, id. *ibid.* fig. 5, fossil in Lias of Mecklenberg, spp. nn.

Phryganeidæ.

McLachlan, Rev. & Synops., 1st Add. Suppl., pp. 1 & 2, remodels this family on Wallengren's plan [cf. Zool. Rec. xvii. *Ins.* p. 197], but, in the case of *Phryganea* and *Neuronia*, adopts that author's subdivisions as subgenera only, and on somewhat different characters.

Phryganea striata, L. A unicolorous pale form occurs at great elevations on the Alps; id. t. c. p. 4.

Agrypnia pagetana, C., var. n. *hyperborea*, id. t. c. p. 4, Finnish Lapland and N.W. Siberia.

Limnophilidæ.

MORTON, K. J. Notes on the larva, &c., of *Asynarchus canosus*, Curt. Ent. M. M. xxi. pp. 125 & 126.

Limnophilus marmoratus, Curt., and *lunatus*, C. Notes on variation in Italian specimens presumably of these species; McLachlan, 1st Add.

Suppl. p. 5. *L. flavo-spinosus*, Stein, occurs in Italy, and *L. correptus*, McLach., in Japan; McLachlan, *t. c.* p. 5.

Acropolyx varberus, Brauer. A form with abbreviated wings occurs in Switzerland; *id. t. c.* p. 8.

Asynarchus cænosus, Curt., is subdivided into 3 scarcely distinct varieties, viz., *cænosus*, C., *arcticus*, Kol., and *paludum*, Kol.; *id. t. c.* p. 8.

Stenophylax mucronatus, McLach. Female described; *id. t. c.* p. 9, pl. i.

Platyphylax frauenfeldi, Brauer, from Naples; *id. t. c.* p. 12.

Halesus ligonifer, McLach., redescribed in both sexes from the Vosges; *id. t. c.* p. 13, pl. i.

Chilostigma præteritum, Walk., in abundance from Eastern Arctic Siberia, partly redescribed; *id. t. c.* pp. 15 & 16, pl. i.

Chetopteryx obscurata, McLach., from the Vosges: female described; *id. t. c.* p. 16, pl. i. In Finland; Sahlberg, *Tidskr. Ent.* v. p. 169.

Chetopterygopsis macclachlani, Stein, occurs in the Vosges; *id. t. c.* p. 16.

Enoicyla amana, Hag., redescribed from Swiss examples; *id. t. c.* p. 17, pl. ii.

New species, &c. :—

Limnophilus centralis, Curt., var. n. *italicus*; McLachlan, 1st Add. Suppl. p. 6, pl. i., Apennines.

→ *Anabolia nervosa*, Leach, varr. nn. *excisa* (Hag.), France, and *putoni* (McLach.), Vosges; *id. t. c.* p. 7, pl. i.

Stenophylax crossotus, *id. t. c.* p. 9, pl. i., Corsica.

Mesophylax impunctatus, *id. t. c.* p. 10, pl. i., Switzerland, Scotland, &c.; var. n. *zetlandicus*, *id. Ent. M. M.* xxi. p. 153, Shetland Islands.

Micropterna muehleni, *id.* 1st Add. Suppl. p. 11, pl. i., North Persia.

Catadice estrellensis, *id. t. c.* p. 13, pl. i., Portugal.

Monocentra improvisa, *id. t. c.* p. 15, pl. i., Apennines.

Sericostomatidæ.

Sericostoma. McLachlan, 1st Add. Suppl. p. 18, revises the species of this genus, and subdivides them primarily on the amount of prominence of the maxillary palpi of the ♂, and secondly on the penis-sheaths, and refigures the latter for nearly all the species (pl. ii.), showing the variation to which these structures are liable. Some slight changes in synonymy occur. *S. memorabile*, McLach., is considered a condition of *S. pedemontanum* (p. 21), for which 22 figures are given (including 3 that perhaps pertain to a distinct species from the Tyrol).

Schizopolex festiva, Rambur. Notes on variation in examples from Portugal; *id. t. c.* p. 23.

Silo rufescens, Rambur, redescribed from a specimen from Corsica; *id. t. c.* p. 24, pl. iii.

Micrasema, McLach. Additional notes on several species (including one possibly new from Switzerland and Belgium); *id. t. c.* pp. 25 & 26.

Helicopsyche. Lengthy notes on this genus are given, and new species described, with indications of others, and details as to cases, &c. The supposed cases from the Valais belong to *Psyche helia*. The case of

H. sperata, McLach., is *Valvata agglutinans*, Tassinari (described as a shell); McLachlan, *t. c.* pp. 27-30.

Lepidostoma hirtum, F. Additional notes and figures of the anal parts; *L. fimbriatum*, E. Pict., noticed from examples from Portugal: *id. t. c.* p. 31, pl. ii.

Dinarthrum pugnax, McLach. Anal parts redescribed and refigured; *id. t. c.* p. 31, pl. ii.

New species :—

Sericostoma maclachlanianum, Costa, Rend. Acc. Nap. xxiii. p. 20, and McLachlan, *t. c.* p. 22, pl. ii., Sardinia.

Silo mediterraneus, McLachlan, *t. c.* p. 23, pl. ii., Italy and Sardinia.

Micrasema scissum, *id. t. c.* p. 26, pl. iii., Behring Straits.

Thremma sardoum, Costa, *t. c.* p. 20, and McLachlan, *t. c.* p. 27, Sardinia.

Helicopsyche lusitanica, McLachlan, *t. c.* p. 28, pl. iii., Portugal, and *revelieri* (= *shuttleworthii*, case only), p. 29, pl. iii., Corsica.

Leptoceridæ.

MORTON, K. J. On the Larva, &c., of *Beræodes minuta*, Linné. Ent. M. M. xxi. pp. 27-29.

The author describes the case, larva, and manner of life; the observations proving that the position of the insect and its allies is in the *Leptoceridæ*.

Beræa. Additional notes on the European species, with figures; McLachlan, 1st Add. Suppl. pp. 32 & 33, pl. iv.

Leptocerus braueri, E. Pict., restored as a species, and redescribed; *id. t. c.* p. 35, pl. iv. *L. commutatus* (Rostock), McLach.: a character in the antennæ of female noticed; p. 36.

Tricnoides ochreella, McLach., redescribed from examples from Portugal; *id. t. c.* p. 37, pl. iv.

Adicella filicornis, Pict., found in Scotland; K. J. Morton, Ent. M. M. xxi. p. 91.

Setodes. The European species divided into two groups; McLachlan, *t. c.* p. 40.

Calamoceras. Additional generic notes, and *C. volxemi*, McLach., redescribed from Portugal; *id. t. c.* pp. 41 & 42, pl. iv.

New species :—

Leptocerus inequalis and *cuneorum*, McLachlan, *t. c.* p. 34, pl. iv., Portugal.

Mytacidæ leucoptera, *id. t. c.* p. 37, Lago di Garda.

Erotesis (?) *melanella*, *id. t. c.* p. 38, pl. iv., Portugal.

Setodes lusitanica, *id. t. c.* p. 40, pl. v., Portugal.

Hydropsychidæ.

Additional critical remarks on many known species, especially from Portugal and Italy, are given by McLachlan, 1st Add. Suppl. pp. 42-59.

Lyte reducta, Hag., found in England on the Thames, with notes; McLachlan, Ent. M. M. xxi. p. 113.

New species, &c. :—

Hydropsyche consanguinea, p. 42, pl. v., North Persia, *lobata*, p. 43, pl. v., Portugal, *saxonica* (= *fulvipes*, McLach., partim, olim), *ibid.* pl. v., Saxony, (?) *tibialis*, p. 45, pl. v., Portugal, McLachlan, *t. c.*

Philopotamus perversus, *id. t. c.* p. 46, pl. v., and *amphilectus*, p. 48, pl. v., Portugal; *P. montanus* var. *cesareus*, *id. t. c.* p. 47, Jersey, and var. *chrysopterus*, Morton, Ent. M. M. xx. p. 273 (McLachlan, *t. c.* p. 47), Scotland.

Dolophilus corvinus, McLachlan, *t. c.* p. 49, pl. v., Portugal.

Plectrocnemia inflata, p. 50, pl. v., Portugal, *præstans*, p. 51, pl. v., North Italy, *conspersa* (Curt.) var. n. *breviuscula*, *ibid.* pl. v., North Italy, *apennina*, p. 52, pl. v., Central Italy, *id. t. c.*

Polycentropus corniger, *id. t. c.* p. 53, pl. vi., Portugal and French Pyrenees, *telifer*, p. 54, pl. vi., Portugal.

Cyrnus cintranus, *id. t. c.* p. 54, pl. vi., Portugal.

Ecnomus deceptor, *id. t. c.* p. 55, pl. vi., Portugal and Belgium.

Tinodes fædella, *id. t. c.* p. 57, pl. vi., Portugal.

Lyte auripilis, *id. t. c.* p. 58, pl. vi., Portugal.

Psychomyia ctenophora, *id. t. c.* p. 59, pl. vi., Portugal.

Rhyacophilidae.

Rhyacophila. Additional local notes on many European species are given by McLachlan in 1st Add. Suppl. pp. 60-65; new figures for the anal parts of *R. meyeri*, McLach., from N. Italian examples, are given on pl. vii. A male of *R. rougemonti*, McLach., from Corsica, is noticed at p. 63.

Glossosoma nylanderi, McLach. Notes and figures; *id. t. c.* p. 66, pl. vii.

Agapetus laniger, Pict., and *pactus*, McLach. Errors in former synonymy pointed out; *id. t. c.* p. 67.

Ptilocolepus. Additional generic and specific notes, and the anal parts of *P. granulatus*, Pict., refigured; *id. t. c.* pp. 69 & 70, pl. vii.

New genus :—

Cutagapetus, McLachlan, 1st Add. Suppl. p. 68. Allied to *Agapetus*; differs from all other genera of the group in having a closed discoidal cell in posterior wings. *C. nigrans*, sp. n., p. 69, pl. vii., Portugal (a second species from Central Italy indicated, *ibid.*).

New species :—

Rhyacophila vestispina, McLachlan, *t. c.* p. 61, pl. vii., North Italy, *adjuncta* and *lusitanica*, p. 63, pl. vii., Portugal.

Glossosoma privatum, *id. t. c.* p. 65, pl. vii., Portugal.

Agapetus incertulus; *id. t. c.* p. 66, pl. vii., Portugal, *delicatulus* (= *laniger*, McLach., nec Pict.), p. 67, Pyrenees.

Pseudagapetus diversus, *id. t. c.* p. 67, pl. vii., Portugal.

Ptilocolepus extensus, *id. t. c.* p. 70, pl. vii., Portugal.

Hydroptilidæ.

Agraylea pallidula, McLach., from Lago di Garda, noticed; McLachlan, 1st Add. Suppl. p. 70.

Allotrichia pallicornis, Eaton, from Portugal and Central Italy; *id. t. c.* p. 70.

Stactobia fuscicornis, Schnd., from many additional localities; *id. t. c.* p. 72.

Orthotrichia atra, Hag., is a *Stactobia*, and is redescribed; *id. t. c.* p. 71.

Hydroptila femoralis, Eaton, in Scotland; J. J. King, Ent. M. M. xxi. p. 39.

New species:—

Hydroptila longispina, McLachlan, *t. c.* p. 71, pl. vii., England.

Oxyethira spinosella, *id. t. c.* p. 72, Madeira, *unidentata*, p. 73, Portugal.

NEUROPTERA-PLANIPENNIA.

GERSTÆCKER, A. Vier Decaden von Neuropteren aus der Familie *Megaloptera*, Burm. MT. Vorpomm. xvi. pp. 1-49 (1885, but separate copies dated 1884).

Panorpidæ.

Boreus hyemalis captured in the forest of Villers-Cotterets (France); notes on pairing: Poujade, Bull. Soc. Ent. Fr. (6) iv. p. cxl.

Sialidæ.

KRAUSS, W. C. On the Nervous System of the Head of the Larva of *Corydalus cornutus*, Linn. Psyche, iv. pp. 179-184, pl. ii.

The nervous system consists of (1) the supra-oesophageal ganglia or cerebrum, (2) the crura cerebri, (3) the sub-oesophageal ganglia or cerebellum and nerves, (4) the commissures, (5) the vagus nerve, each sending off its special branches to the cephalic appendages, &c. The plate is occupied by 7 outline figures of explanatory details.

WOOD-MASON, J. Description of an Asiatic species of the Neuropterous genus *Corydalus*. P. Z. S. 1884, p. 110, pl. viii.

Describes both sexes of *C. asiatica*, sp. n., from the Naga Hills (with figures), the first record of the occurrence of the genus in the Old World.

Rhaphidiidæ.

Rhaphidia. A probably new species from the Vosges indicated; McLachlan, Rev. d'Ent. iii. p. 16.

Myrmeleonidæ.

MCLACHLAN, R. *Acanthaclisis occitanica* and *A. batika*; a differential essay. Ent. M. M. xx. pp. 181-184.

Tabular characters of the two species are given, together with local and bibliographical notes.

[McLACHLAN, R.] Concerning *Tomateres pardalis*, F., and *T. clavicornis*, Latr., two very closely allied species of *Myrmeleonida*. *T. c.* pp. 184 & 185.

Points out that these two supposed species, from India and Senegal respectively, are distinguishable only by the slightest characters, and that *clavicornis* also occurs in Abyssinia.

MOFFAT, J. A. Notes on Ant Lions. *Canad. Ent.* xvi. pp. 121 & 122.

Popular notes on Canadian species.

REDTENBACHER, J. Uebersicht der Myrmeleoniden-Larven. *Denk. Ak. Wien*, xlviii. pp. 335-368, pls. i.-vii.

This memoir was foreshadowed in *Zool. Rec.* xx. *Ins.* p. 255. It commences with prefatory notes, followed by bibliographical record to date. Then follows a dissertation on the systematic position and form of Ant Lion larvæ, in the course of which a remark is made that the presence or absence of certain hairs on and between the teeth of the mandibles appears to be a tolerably safe guide as to whether the larvæ form pits or not. The modes of life form another chapter. It appears that the majority of the larvæ that do not form pits move backwards and forwards, whereas the pit-forming larvæ usually move only backwards. A few words are devoted to Hymenopterous parasites. An attempt at grouping the larvæ into seven divisions is made. In all, 36 species are noticed, some few second hand, and many not determined. The following larvæ are figured, either wholly or in detail only, viz.:—Pl. i., *Dendroleon pantherinus*, *Palpares cephalotes* (?), and *P. libelluloides*; pl. ii., *Acanthacclisis occitanica* and *batica*, and *Formicaleo tetragrammicus*; pl. iii., *Creagris plumbeus* (?), *Myrmecaelurus trigrammus*, and *M. sp.*; pl. iv., *Macrone-murus appendiculatus* (?) and *bilineatus* (?), and *Megistopus flavicornis* (?); pl. v., two doubtful species of *Myrmecaelurus*, and two others not determined; pl. vi., *Myrmeleon erberi*, and four doubtful; pl. vii., *Myrmeleon europæus* and *formicarius*.

Formicaleo tetragrammicus, F., occurs in Switzerland; McLachlan, *Ent. M. M.* xx. p. 185.

New genera :—

Protoplectron, Gerstæcker, *MT. Vorpomm.* xvi. p. 15. Allied to *Formicaleo*; especially distinguished by the dentate claws. *P. venustum*, sp. n., p. 16, Rockhampton.

Episalus, id. *t. c.* p. 19. Near *Glenurus*; differs especially in the form of the wings, tarsi, &c. *E. zephyrinus*, sp. n., *t. c.* p. 20, Duke of York Island.

New species :—

Acanthacclisis rufescens, Gerstæcker, *t. c.* p. 10, Cameroons, *inquinata*, p. 11, Congo.

Formicaleo somnolentus, id. *t. c.* p. 13, Gayndah, *perlatus*, p. 14, Transvaal.

Glenurus heteropteryx, id. *t. c.* p. 17, Chiriqui.

Myrmeleon polyzonus, id. *t. c.* p. 21, Cameroons, *eurystrictus*, p. 22,

Rangoon, *trivialis*, p. 23, Himalaya, *polyspilus*, p. 24, Amur, *meteoricus*, p. 25, Peak Downs, *dissolutus*, p. 26, Australia, *osmyloides*, p. 27, Australia, *uniseriatus*, p. 29, Sydney, *simplicissimus*, *ibid.*, Cameroons, *croceicollis*, p. 30, Australia, *filiformis*, p. 31, Cameroons, *trivirgatus*, p. 32, Transvaal; *M. quedenfeldti*, Kolbe, B. E. Z. xxviii. p. 134, Morocco.

Gymnocnemis pentagramma, Gerstæcker, t. c. p. 34, Peak Downs.

Ascalaphidæ.

New genus :—

Dicolpus, Gerstæcker, MT. Vorpomm. xvi. p. 7. Eyes divided. Antennæ simple, shorter than the posterior wings. Anterior wings twice deeply sinuate on the inner margin. Abdomen of the ♂ linear, the cerci exserted, dilated towards the base. *D. volucris*, sp. n., *ibid.*, Cameroons.

New species :—

Haploglenius pictus, Gerstæcker, t. c. p. 3, Upper Amazons.

Uula præcellens, *id.* t. c. p. 3, and *immersa*, p. 4, Chiriqui.

Suphalasca bacillus, *id.* t. c. p. 5, and *euryptera*, p. 6, Cameroons.

Ascalaphus radians, *id.* t. c. p. 8, Amur, *expansus*, p. 9, Asia Minor.

Nemopteridæ.

An undescribed species from Coquimbo, Chili, noticed by McLachlan, P. E. Soc. 1884, p. xxviii.

Mantispidæ.

Mantispa styriaca taken near Berlin; Kolbe, Ent. Nachr. x. p. 287.

New genus :—

Theristria, Gerstæcker, MT. Vorpomm. xvi. p. 43. Vertex tumid. Pronotum short, setulose. Anterior legs pilose, the tarsi slightly dilated, tarsi biunguiculate. All the wings with one series of oblique cellules. *T. felina*, sp. n., p. 44, Peak Downs.

New species :—

Mantispa phthisica, *id.* t. c. p. 35, Ega, *limbata*, p. 36, Chiriqui, *nuchalis*, p. 38, Sydney and Rockhampton, *manca*, p. 39, Amboina, *imbecilla* and *pavida*, p. 41, Rockhampton, *tenuistriga*, p. 42, Rockhampton.

Nymphidæ.

Nesydrium, g. n., Gerstæcker, MT. Vorpomm. xvi. p. 47. Antennæ rather strong, attenuate towards the apex. Wings obtusely lanceolate, postal area broad, towards the apex closely reticulate, first sector furcate far before the second, one row of cellules between the posterior cubitus and the margin. Tibiæ shortly spurred internally. *N. fuscum*, sp. n., p. 48, Australia.

Myodactylus placidus, sp. n., *id.* t. c. p. 49, Peak Downs.

Osmylidæ.

Osmylus perspicillaris, sp. n., Gerstæcker, MT. Vorpomm. xvi. p. 46, Darjiling.

Sisyra iridipennis, sp. n., Costa, Rend. Acc. Nap. xxiii. p. 20, and Atti Acc. Nap. (2) i., Sardinia.

Hemerobiidæ.

Observations on the manner in which the larvæ of *Hemerobius* (and *Chrysopa*) are able to walk on the smooth under sides of leaves, and on glass, &c., by means of a secretion from the feet, are given by H. Dewitz, in Ent. Nachr. x. pp. 133 & 134.

Chrysopidæ.

Chrysopa dorsalis, Burm., *nigricostata*, Brauer, *viridana*, Schnd., and *flava*, Scop., recorded from Switzerland; McLachlan, Ent. M. M. xx. p. 185. *C. venosa*, Rambur, occurs in Persia; *id. t. c.* p. 274. *C. vulgaris*, Schnd., in great abundance at Lowestoft, England; W. C. Boyd, Ent. M. M. xxi. p. 21.

New species :—

Chrysopa ypsilon, Costa, Rend. Acc. Nap. xxiii. p. 20; renamed *bifidilinea*, in Atti Acc. Nap. (2) i., Sardinia.

Anomalochrysa maculachlani, Blackburn, Ann. N. H. (5) xiv. p. 418, montana, p. 419, and *ornutipennis*, p. 420, Hawaiian Islands.

Ancylopteryx splendidissima, Gerstæcker, MT. Vorpomm. xvi. p. 45, Cameroons.

PSEUDO-NEUROPTERA.

THYSANURA.

GRASSI, B. Intorno all' Anatomia dei Tisanuri. Nat. Sicil. iii. pp. 203-208 & 236-241.

Observations made principally on *Japyx*. Parona replies to certain personal statements by the author, at *t. c.* pp. 252 & 253.

PARONA, C. Materiali per lo studio della Fauna Tunisina raccolti da G. e L. Doria. iv. Sopra alcune *Collembola* e *Thysanura* di Tunisi. Ann. Mus. Genov. xxi. pp. 425-438, pl. ii.

Enumerates (and in part redescribes) 4 species of *Sminthurus* (2 new), 1 *Lepidocyrtus*, 3 *Lepisma*, 2 *Lepismina*, and 3 *Machilis*.

REUTER, O. M. Etudes sur les Collemboles. Act. Fenn. xii. pp. 1-21, pl. i.

Divided into 3 parts. Pt. i. is "Sur l'accouplement du *Sminthurus*" (pp. 3-9). The author confirms the observations of Tullberg, &c., that the animals couple back to back, and remain in this position several days, by means of a singular formation of the male antennæ, which are coiled round the simple antennæ of the female; but in the (new) species on which the observations are principally based, such coupling only takes

place between young and small individuals, and the curious formation disappears in the antennæ of large males; the male lies back to back with the female, the former being uppermost, but they jump often; notwithstanding repeated and prolonged observation, he was never able to see any direct genital action. Pt. ii. (pp. 10-19) is occupied by a very lengthy memoir "Sur la fonction du tube ventral du *Sminthurus*," and, as a result of his observations, he is of opinion that the essential aim of this tube is to cause to enter (conjointly with the mouth) into the body of the animal the drop of water which, by aid of the claws constructed for the purpose, is obtained by friction from the surface of the body, where the moisture is collected from the atmosphere by the hygroscopic action of the hairs. Pt. iii. (p. 20) is occupied by diagnoses of two new species.

*SOMMER, A. Ueber *Microtoma plumbea*. Beiträge zur Anatomie der Poduriden. (Inaug. Diss.) Göttingen: 1884, 45 pp. Z. wiss. Zool. xli. [1885] pp. 683-718, pls. xxxiv. & xxxv.

Sminthurus luteus, Lubbock, is found on vine leaves in Hungary, and is often mistaken for *Phylloxera*; E. Tömösváry, Rov. Lapok, i. pp. 139-141, woodcut, & p. xviii.

Podura aquatica, L., and *Achorutes armatus*, in numbers on snow and puddles of water in Hungary; *id. t. c.* pp. 230 & xxix.

Lepisma saccharina. Notes on the habits (in Hungarian); *id. t. c.* pp. 19 & 20.

Sminthurus apicalis, Reuter, Act. Fenn. p. 20, pl. i. figs. 1-12 (details), and *elegantulus*, *ibid.* pl. i. fig. 13 (antennæ of young male), Finland; *S. bicolor*, Parona, Ann. Mus. Genov. xvi. p. 429, pl. ii. fig. 1, and *doriae*, p. 430, pl. ii. fig. 2, Tunis: spp. nn.

MALLOPHAGA.

OSBORN, H. Notes on *Mallophaga* and *Pediculidæ*. Canad. Ent. xvi. pp. 197-199.

Concerns species apparently common to Europe and N. America, with the names of the hosts.

Menopon consanguineum, sp. n., Piaget, Notes Leyd. Mus. vi. p. 111.

THYSANOPTERA.

Phlaothrips albosignata, sp. n., Reuter, Rev. d'Ent. iii. p. 290, Algeria.

TERMITIDÆ.

HAGEN, H. A. Ueber Termitenschaden. S. E. Z. xlv. pp. 167-172.

A translation of a popular article on the ravages of White Ants in general, and of *Termes flavipes* in particular, that appeared in the "Boston Evening Transcript" for November 15th, 1883, with prefatory note by C. A. Dohrn.

SØRENSEN, W. Træk af nogle sydamerikaniske Insecters Biologi. Ent. Tidskr. v. pp. 1-25, pl. i.

— Principally concerns *Termitidæ*; 3 supposed new species are described.

Notes on the Hawaiian species; T. Blackburn, Ann. N. H. (5) xiv. p. 413.

Destruction of printed books by White Ants at Calcutta; McLachlan, Ent. M. M. xx. p. 185.

Porotermes chilensis, Gay, redescribed; Bolivar, Viaje al Pacifico, p. 3.

Geinitz notices the occurrence of *Clathrotermes geinitzi*, Heer., and some other forms in the Lias of Mecklenburg; Arch. Ver. Mecklenb. xxxvii.

New species :—

Termes strunckii, Sørensen, t. c. pp. 2, 3, & 18-20, Argentine Republic, *christiernsonii*, pp. 3-11 & 20-22, figs. 1-12, Argentine Republic, *orensis*, pp. 11-13, 22, & 23, figs. 13-16, Argentine Republic, *lucus-sancti*, p. 23, Minas Geraes.

EMBIIDÆ.

Oligotoma insularis, McLach., feeds in numbers in old wooden roofs of houses in the Hawaiian Islands; T. Blackburn, Ann. N. H. (5) xiv. p. 413.

Wood-Mason's memoir [cf. Zool. Rec. xx. Ins. p. 259] noticed and abstracted in Am. Nat. xviii. p. 1154.

PSOCIDÆ.

KOLBE, H. J. Der Entwicklungsgang der Psociden im Individuum und in der Zeit. B. E. Z. xxviii. pp. 35-38.

An amended sketch of a previous paper [cf. Zool. Rec. xix. Ins. p. 262] on the phylogenetic classification of the family, which the author divides into 5 groups, thus :—*Atropidæ*, *Psoquillidæ*, *Empheriidæ*, *Caciliidæ*, and *Psocidæ-genuina*.

— Zur Frage über die Quintessenz des Characters im Habitus einer zoologischen Species. T. c. pp. 39-42.

Principally concerns *Stenopsocus immaculatus*, Steph., and *S. lachlani*, Kolbe, which the author maintains are distinct, and for which he gives tabulated diagnostic and comparative characters.

— Das Tracheensystem des Kopfes der Bücherlaus (*Atropos pulsatoria*, L.). T. c. pp. 177 & 178, woodcut.

— Ueber die von Herrn Ludy in Ober-Bayern, Kärnthen, und im Littorale gessammelten Psociden. T. c. pp. 380-382.

A list of 20 species (some new), with comparative local notes.

— Ueber *Hyperetes* in biologischer und systematischer Beziehung, nebst einer Studie über die phylogenetische Stellung dieser Gattung. Ent. Nachr. x. pp. 84-87.

On the distribution of *H. guesfalicus*, Kolbe, with an examination of characters tending to maintain its position as a perfect insect of the

Atropide, with an historical and biographical sketch. Allusion is made to certain spines on the maxillary palpi similar to those on the legs, and as *Hyperetes* maintains its primary form, it is considered that such spines indicate that palpi were originally leg-like appendages in the prototypes of insects. The author disagrees with Hagen's supposition that *Termes fatidicus*, Linné, was a *Hyperetes*, and considers it was the larva of *Cecilius pedicularius*.

[KOLBE, H. J.] Beitrag zur Kenntniss der Psocidenfauna der Berliner Umgegend. *T. c.* pp. 287-290.

Especially concerns *Kolbia quisquiliarum*, Bertkau, which the author found in rubbish near Berlin. A re-examination of the characters of the insect was made, and some additional points are given.

McCook, H. C. On a Web-spinning Neuropterous Insect. *P. Ac. Philad.* 1883 (1884), pp. 278 & 279.

Calls attention to web-spinning by *Psocus sexpunctatus* and *P. purus* in America, as confirming previous statements, and with speculations as to progressive or retrogressive evolution in connection with web-spinning in spiders, in larvæ, and in perfect insects.

G. R. Websdale, *Ent.* xvii. p. 236, expresses his belief that *Atropos* is one cause of the sound known as the "death-watch."

Cecilius atricornis, McLach., and *Stenopsocus stigmaticus*, Imh., at Chertsey, in England; McLachlan, *Ent. M. M.* xxi. p. 113.

Cerastipsocus, g. n., Kolbe, *B. E. Z.* xxviii. p. 38 (= *Cerastis*, Kolbe, 1882, preoccupied).

Psocus montanus, sp. n., *id. t. c.* p. 383, Upper Bavaria.

Cecilius oculatus, sp. n., *id. t. c.* p. 381, Görz.

PERLIDÆ.

YUTAKA, ARTAKE. Great Swarms of a Pseudo-Neuropterous Insect in Japan. *Am. Nat.* xviii. p. 1266.

Concerns an insect, stated by Hagen to be a species of *Capnia*, that swarmed in Feb., 1878 (and in Dec., 1877), near Hakodaté, to such an extent as to darken the air.

EPTHEMERIDÆ.

EATON, A. E. A Revisional Monograph of Recent *Ephemeroide* or May-flies. Part ii. *Tr. L. S.* (2) iii. pp. 77-152, pls. xxv.-xliv. [*Cf. Zool. Rec.* xx. *Ins.* p. 262.] Part i. is noticed at length in *Am. Nat.* xviii. pp. 630-632.

Comprises three series of Group II. of the genera, extending from *Potamanthus* to *Prosopistoma*, thus:—*Potamanthus*, *Rhoënanthus*, *Atalophlebia*, *Leptophlebia*, *Blasurus*, *Choroterpes*, *Thraulus*, *Adenophlebia*, *Hagenulus*, *Habrophlebia*, *Calliarctus*, *Ephemerella*, *Teloganodes*, *Tricorythus*, *Leptohyphes*, *Cenis*, and *Prosopistoma*, all previously described. The following plates in Part i. refer to the text in Part ii., viz.:—Pl. ix., *Potamanthus* and *Rhoënanthus*; x., *Atalophlebia*; xi., *Leptophlebia* and

Blasturus; xii., *Choroterpes* and *Thraulius*; xiii., *Thraulius*; *Adenophlebia*, *Habrophlebia*, and *Calliarcys*; xiv., *Calliarcys* and *Ephemerella*; xv., *Hagenulus*, *Teloganodes*, *Tricorythus*, *Leptohyphes*, *Cænis*, and *Prosopistoma*, all consisting of details of the perfect insects. The plates in Part ii. represent the nymphs and innumerable anatomical details, as follows:—Pl. xxv., *Palingenia*; xxvi., *Oligoneuria rhenana*; xxvii., *Jolia roeseli*; xxviii., *Polymitarcys virgo*; xxix., *Hexagenia* and *Euthyplocia*; xxx., *Ephemera vulgata*; xxxi., *Potamanthus luteus*; xxxii., *Leptophlebia cincta*; xxxiii., *Blasturus* sp.; xxxiv., *Choroterpes picteti*; xxxv., *Thraulius bellus*; xxxvi., *Habrophlebia fusca*; xxxvii., *Ephemerella ignita*; xxxviii.—xl., unnamed nymphs allied to *Ephemerella* (pp. 131–134); xli., *Tricorythus* (?) and *Cænis maxima* (Joly, MS.); xlii., *Cænis halterata* and *maxima*, and one other; xliii., *Prosopistoma*; xliv., *Bætis rhodani*; xlv., unnamed ally of *Centropilum* (xliv. & xlv. are in advance of the text).

PALMÉN, J. A. Ueber paarige Ausführungsgänge der Geschlechtorgane bei Insecten; eine morphologische Untersuchung. Helsingfors: 1884, pp. 1–107, with 5 pls.

An extension of the paper by the same author published in 1883, and noticed in Zool. Rec. xx. *Ins.* p. 262. The author has taken *Ephemeridæ* in particular as subjects for investigation. After reviewing the works of previous authors, he enters minutely into the anatomy of the sexual organs in both sexes, with the morphological results and deductions therefrom. These insects form the exception in having the male sexual organs double from beginning to end. The plates are entirely anatomical, and the details are drawn from the genera *Palingenia*, *Hep-tagenia*, *Potamanthus*, *Bætis*, *Ephemerella*, *Polymitarcys*, &c. Pl. v. is also occupied by partly hypothetical figures from other insects, *Crustacea*, &c. An extended abstract appears in Am. Nat. xviii. pp. 1152 & 1153.

SCHOCH, G. *Ephemerella ignita*, Poda, eine pædogenetische Eintagsfliege. MT. schw. ent. Ges. vii. pp. 48–50.

A nymph found in an aquarium at Zürich was placed on a microscopic slide, and on the application of glycerine it was discovered that the abdomen contained about 100 eggs, which were apparently fertile. Hence the author concludes that pædogenesis occurs.

In July, 1884, enormous swarms of *Ephemeridæ* occurred on the American Lakes. On the morning of July 7th, at Lake Erie, under an electric lamp, a mass of dead insects covered a space of 25 square feet to a depth of six inches. Ent. Nachr. x. p. 265.

Leptophlebia pallipes, Hag., renamed *memorialis*; Eaton, t. c. p. 98.

Potamanthus cinctus, Pict., renamed *Habrophlebia lauta*; id. t. c. p. 120.

Bætis fusca, Walk., renamed *Ephemerella walkeri*; id. t. c. p. 129.

Cænis lactea, Pict., renamed *lacteella*; id. t. c. p. 144.

New species:—

Atalophlebia chilensis, Eaton, t. c. p. 91, pl. x., Chili, *tabularis*, *ibid.* pl. x., Cape of Good Hope.

Leptophlebia meyeri, id. t. c. p. 95, pl. xi., Switzerland, *racina*, p. 97,

pl. xi., Oregon, *gregalis*, p. 98, Oregon, *rufivenosa*, p. 99, Oregon, Washington Territory and California, *præpedita*, p. 99, pl. xi., Massachusetts.

Blasturus gravastellus, Eaton, t. c. p. 102, Montana.

Thraulius exiguus, id. t. c. p. 108, pl. xiii., Lahat, *mexicanus*, p. 109, pl. xiii., Mexico, *lepidus*, *ibid.*, Chiriqui, *lætus*, p. 110, pl. xiii., New Granada.

Habrophlebia nervulosa, id. t. c. p. 117, Portugal, *umbratilis*, p. 119, Central Italy.

Ephemerella inermis, id. t. c. p. 127, Colorado, *grandis*, p. 128, pl. xiv., Colorado.

Teloganodes major, id. t. c. p. 136, Ceylon.

Cenis dimidiata, Steph., var. n. *rivulorum*, id. t. c. p. 143, England, *robusta*, p. 145, Holland.

ODONATA.

BORMANS, A. DE. Notes sur quelques Odonates. C.R. ent. Belg. 1884, pp. cclxxvi.-cclxxix.

A list of 17 species captured in July and August at Ixelles, near Brussels. *Diplax fonscolombii*, Selys, was abundant, and a single example of *Anax parthenope*, Selys, new to Belgium, was taken.

McLACHLAN, R. The British Dragon-flies annotated. Ent. M. M. xx. pp. 251-256.

Of the 46 species in the British list, 8 are considered as only casual visitors or otherwise doubtful, and some others are apparently becoming rare or extinct.

MEYER-DÜR, L. R. Seltene Libellen der schweizerischen Fauna. MT. schw. ent. Ges. vii. pp. 52-55.

Principally concerns *Æschna borealis*, Zett. (the distinctive characters of which the author details), *Cordulia arctica*, Zett., *Gomphus uncatus*, Chp., and *G. flavipes*. Ends with comparative notes on the Swiss species with those of Europe generally.

VIALLANES, H. Le ganglion optique de la *Libellula* (*Æschna maculatissima*). Ann. Sci. Nat. (6) xviii. pp. 1-34, pls. xiv.-xvi.

Purely anatomical.

—. Anatomie et dissection de la larve de Libellule. Feuille. Nat. xiv. pp. 81-87, pl. ii.

An original and apparently careful essay from observations made on the larva (or "nymph") of probably an *Æschna*.

Migration. Van Bemmelen notes on a swarm in the Rotterdam Zoological Garden in June, 1880; Tijdschr. Ent. xxvii. Verslag, p. xci. C. Chyzer gives notes on a swarm in Hungary on May 8th, 1880; it was composed exclusively of *Libellula depressa* and *Agrion pulchellum*; Rov. Lapok, i. pp. 125 & xv.

Dragon-flies at sea off the coast of S. America; Fromont & Selys, C.R. ent. Belg. 1884, p. lxxxv.

A local list of 13 species occurring near Worcester is given by J. E. Fletcher, Ent. M. M. xx. p. 273.

Larvæ of some species of Dragon-fly destructive in a piscicultural establishment in Hungary; 50,000 young fish were placed in a pond in spring, and in September only 54 remained, but there were immense quantities of Dragon-fly larvæ: L. Biró, Rov. Lapok, i. pp. 251-253 & xxx.

Bolivar, Viaje al Pacifico [vide *Orthoptera*, The General Subject], notes and describes the following:—*Phyllopetalia apollo*, Selys, p. 4, Chili, *Æschna bonariensis*, F., p. 5, Chili, *Euthore plagiata*, Selys, p. 6, Napo, *Megaloprepes carulatus*, Drury, p. 7, S. America, and *Lestes undulata*, Say, p. 8, Baeza.

Libellulina.

SELYS-LONGCHAMPS, E. DE. Révision des *Diplax* paléarctiques. Ann. Ent. Belg. xxviii. pp. 29-45.

The author includes Japan in the palæarctic region. 25 species are noticed, divided into 4 groups, viz., (1) that of *trivialis*, Ramb., (2) that of *vulgata*, L., (3) that of *erotica*, Selys, and (4) that of *corrupta*, Hag., the latter placed by Hagen in *Mesothemis*, which, however, should be limited to *simplicicollis*, Say, and its immediate allies. *D. elota*, Selys, is given as only a Japanese race of *pedemontanum*, All.; *D. striolata*, Chp., forms only a doubtful race of *vulgata*, L. Tables of the different groups are given; in that for group 4 a species (undescribed?) from Washington Territory, named *chrysoptera* (p. 42) is included. *D. frequens*, Selys, var. *darwiniana*, is identical with *D. sinensis*, Selys.

Sympetrum fonscolombii, Selys, captured at Deal (the third British example); C. G. Hall, Ent. M. M. xxi. p. 21. Notes on a British specimen of *S. meridionale*; McLachlan, *ibid.*

New species, &c. :—

Diplax vulgata, race *nigrifemur*, Selys, t. c. p. 35, Madeira and Canaries, race *decolorata*, *ibid.*, Armenia; *D. armeniaca*, *id.* t. c. p. 36, Armenia, *hypomelas*, p. 37, Khasia Hills, *commixta*, p. 38, N. India, *kunckeli*, p. 39, N. China, *baccha*, p. 40, China; *D. pacificus*, Kirby, Ann. N. H. (5) xiii. p. 455, Tongatabu.

Æschnina.

Anax strenuus, Hag. Notes on an example probably belonging to this species are given by T. Blackburn in Ann. N. H. (5) xiv. p. 413.

Anax longipes, Hag. Notes on the capture of this rare species in Massachusetts, and on its habits and colour when living, &c., are given by Hagen in Ent. M. M. xx. pp. 169 & 170; which notes are followed by McLachlan, t. c. p. 171, by remarks, and by observations on *A. speratus* and *rutherfordi* from information furnished by Hagen.

Æschna pratensis preying upon *Cordulia flavomaculata*; D. Kuthy, Rov. Lapok, i. pp. 186 & xxiv.

Gomphina.

McLACHLAN, R. Description de deux espèces nouvelles de Gomphines orientales. C.R. ent. Belg. 1884, pp. vii.-x..

Macrogomphus thoracicus, McLachlan, *t. c.* p. vii., Pérek, *abnormis*, Selys, *t. c.* p. x., Borneo ?, spp. nn.

Gomphus abdominalis, sp. n., McLachlan, *t. c.* p. viii., N. China.

Agrionina.

Ischnura maroccana, sp. n., Kolbe, B. E. Z. p. 133 (and var. ♀, *fluvistyla*, p. 134), Morocco.

Agrion (?) *satelles*, p. 414, (?) *oahuense* and (?) *nigro-hamatum*, p. 415, and (?) *koelense*, p. 417, spp. nn., Blackburn, Ann. N. H. (5) xiv. Hawaiian Islands.

ORTHOPTERA.

BY

ROBERT McLACHLAN, F.R.S., F.L.S., &c.

THE GENERAL SUBJECT.

BOLIVAR, I. Observations sur les Orthoptères d'Europe et du bassin de la Méditerranée, et description de cinq espèces nouvelles. C.R. ent. Belg. 1884, pp. cii.-cvii.

The descriptions are preceded by critical remarks, chiefly on some points of nomenclature, &c., adopted by Brunner von Wattenwyl in his "Prodrömus."

— Artrópodos del Viaje al Pacifico, verificado de 1862 á 1865 por una comision de Naturalistas enviada par el Gobierno Español. Insectos. Neuropteros y Ortópteros. Madrid: 1884, 4to, pp. 1-114, pls. i.-iii.

Twenty years appear to have elapsed since the materials noticed in this memoir were collected. All the species are described in detail (and several are figured); but, with one or two exceptions, those that were new seem to have been already noticed by the author in An. Soc. Esp. for 1881. A few new forms, not strictly pertaining to the "voyage," are noticed in footnotes.

BORMANS, A. DE. Le Crociere dell' Yacht ' Corsaro,' del Cap. E. d'Albertis. vi. Ortoteri. Ann. Mus. Genov. xx. pp. 176-181.

A list of 19 species (2 *Forficulariæ*, 3 *Blattodea*, 10 *Acridiodea*, 2 *Locustodea*, and 2 *Gryllodea*) from the Canary Islands.

— Note sur les Orthoptères recueillis par M. Weyers à Aguilas, Province de Murcie (Espagne). C.R. ent. Belg. 1884, pp. clxxix. & clxxx.

A list of 17 species of all families, with remarks.

FINOT, A. Nouveau Catalogue des Orthoptères de la France. Rev. d'Ent. iii. pp. 21-39.

166 species are enumerated (6 for the first time), viz., 17 *Forficulaires*, 11 *Blattaires*, 6 *Mantides*, 2 *Phasmides*, 62 *Acridiens*, 51 *Locustaires*, and 17 *Grillons*. Diagnostic tables of some of the more extensive genera are given.

[FINOT, A.] Notes sur la préparation des Orthoptères. Feuill. Nat. xiv. pp. 98-100 & 110-114.

KIRBY, W. F. On the *Orthoptera* collected during the recent Expedition of H.M.S. 'Challenger.' Ann. N. H. (5) xiii. pp. 476-479.

A list of 5 *Blattidæ*, 1 *Mantidæ*, 4 *Phasmidæ* (1 new), and 2 *Gryllidæ*, from various localities.

RILEY, C. V. Article "*Orthoptera*," in "The Standard Natural History," ii. pp. 167-204. Boston, Mass.: 1884.

A general account, based on the classification most usually followed. Profusely illustrated with (for the most part not original) woodcuts of the leading forms.

SANTOS, F. MATTOZO. Contributions pour la Faune du Portugal. J. Sci. Lisb. [Separate copy only seen.]

A continuation of the series noticed, as commenced, in Zool. Rec. xix. *Ins.* p. 266. This part is occupied by *Dermaptères* and *Orthoptères*, s. str. 84 species are enumerated, and there is a comparative table of distribution.

W. Macleay, P. Linn. Soc. N. S. W. ix. p. 710, gives a list of 1 species of *Mantidæ*, 2 (both new) of *Phasmatidæ*, and 2 of *Gryllidæ*, from the Macleay Coast, New Guinea.

Costa, Atti Acc. Nap. (2) i., gives a list of species met with in the Island of Sardinia.

FORFICULIDÆ.

BORMANS, A. DE. Six Forficulaires nouveaux de Sumatra. Notes Leyd. Mus. vi. pp. 183-196.

—. Description des deux sexes de la *Labia gravidula*, Gerst. T. c. pp. 197 & 198.

—. Description de deux variétés nouvelles du *Chelisoches ludekingi*, Dohrn. T. c. p. 199.

BORMANS, A. DE, & MARQUET, C. Etude sur le genre *Typhlolabia*, Scudder, et description d'une espèce nouvelle. Bull. Soc. Toulouse, xvii. pp. 33-40.

Gives an analytical description of the genus as Chilian, and adds that of a species from the South of France found under a large embedded stone.

Forficula auricularia as an enemy of *Pulex*. G. Dimmock, Psyche, iv. p. 186, has some curious remarks on this subject. A specimen confined in a small enclosure about 5 cm. in diameter, devoured a large number of fleas and other insects. No notice was taken of a flea unless it touched the earwig, when the latter would excitedly chase the flea and capture it by the mouth parts.

Bolivar, Viaje al Pacifico, enumerates and describes the following known species:—*Labidura livida*, Durieu, p. 9, pl. i. fig. 1, *Anisolabis*

chilensis, Blanch., p. 10, *Sparatta rufina*, Stål, p. 11, *Opisthocosmia luctuosa*, Stål, p. 11.

New species :—

Typhlolabia subterranea, Bormans & Marquet, Bull. Soc. Toulouse, xvii. p. 36, Cette.

Sparatta semifulva, Bormans, Notes Leyd. Mus. vi. p. 183, Sumatra.

Chelisochea ritsemae, id. t. c. p. 185, ? *sobrius*, p. 188, Sumatra.

Opisthocosmia minuscula, id. t. c. p. 190, Sumatra.

Forficula ornata, id. t. c. p. 192, Sumatra ; *F. mabillii*, Rochebrune, Bull. Soc. Philom. (7) vii. p. 175 (1883), Senegambia.

Sphingolabis furcifera, Bormans, t. c. p. 194, Sumatra.

BLATTIDÆ.

BRONGNIART, C. Sur la découverte d'une empreinte d'Insecte dans les grès siluriens de Jurques (Calvados). C.R. xcix. pp. 1164 & 1165. [Cf. also Bull. Soc. Ent. Fr. (6) iv. pp. clviii. & clix.]

A true Silurian fossil insect is here noticed, belonging to the *Blattidæ*, and the author proposes to term it *Palæoblattina douvillei* (g. & sp. nn.).

MIALL, L. C., & DENNY, A. The Natural History of the Cockroach. Sci. Goss. xx.

A series of four papers:—(1) general, pp. 59–63, in which figures are given of *Periplaneta orientalis* and *americana*, and *Blatta germanica*; (2) pp. 106–111, treats of the exoskeleton; (3) pp. 203–210, deals with the organs of respiration and circulation; and (4) pp. 244–252, expounds the nervous system. There are many illustrative woodcuts.

PATTEN, W. On the Development of *Blatta germanica*. Q. J. Micr. Sci. (2) xxiv. [Vide *Trichoptera*, Ins. p. 269.]

SCUDDER, S. H. Triassic Insects from the Rocky Mountains. Am. J. Sci. xxviii. pp. 199–203. Reprinted in Ann. N. H. (5) xiv. pp. 254–259.

Concerns certain fossil insects found near Fairplay, Colorado, by Prof. Lakes. All but two or three are Cockroaches, of which there are 17 species. 11 species (and 5 genera) belong to the *Palæoblattariæ*, and the others resemble Jurassic forms. From these premises the author concludes the deposit to be Triassic, although the plant remains give little support to the idea. 2 new genera (*Spiloblattina*, with 4 species, and *Poroblattina*, with 3 species) are indicated on p. 200.

— The Species of *Mylacris*, a Carboniferous genus of Cockroaches. Mem. Bost. Soc. iii. pp. 299–309, part of pl. xxvii.

10 species enumerated, half of which are new. A tabular key is given. *M. pennsylvanicum*, Scudd., is redescribed (p. 302) from better materials. and a figure given.

An abstract of K stler's paper on the nervous system of *Periplaneta* [cf. Zool. Rec. xx. *Ins.* p. 270] is given in J. R. Micr. Soc (2) iv. p. 223.

Bolivar, Viaje al Pacifico, redescribes the following :—*Blatta germanica*, p. 12, *Phyllodromia nigrita*, B., p. 12, *Ischnoptera unicolor*, Scud., p. 14, *I. consobrina*, Saus., p. 14, *Periplaneta americana*, L., p. 15, *P. australasiae*, F., p. 16, *Panchlora viridis*, Burm., and *maderae*, F., p. 17, *surinamensis*, L., p. 18, *Nauph ta circumvagans*, Burm., p. 19, *Zetobora martinensis*, B., p. 20, pl. i. fig. 2, *Parasph ria ovata*, Blanch., p. 22, *Hormetica tuberculata*, Dalm., p. 23, *Blabera  quatoria*, B., p. 24, pl. i. fig. 3, *B. clara-ziana*, Sauss., p. 26.

Ectobia germanica. Notes on distribution in N. America ; T. W. Fyles, Canad. Ent. xvi. pp. 168 & 169.

Blatta americana imported into the East of England in a cargo of cotton-seed cake from Texas ; E. A. Atmore, Ent. M. M. xx. p. 259, Ent. xvii. p. 95.

Blatta orientalis and its use in medicine. An extract from a paper on this subject by T. Bogomolow, published in the St. Petersburg med. Wochenschrift, appears in Psyche, iv. pp. 119 & 120.

Blatta. Bolivar is of opinion that this generic name should be limited to *B. germanica* amongst European species, which should be separated from *Phyllodromia* ; C.R. ent Belg. 1884, p. civ.

New species :—

Aphlebia betica, Bolivar, C.R. ent. Belg. 1884, p. cv., Spain.

Phyllodromia carsiphila, Rochebrune, Bull. Soc. Philom. (7) vii. p. 175 (1883), Senegambia.

Oxyphaloe kilensis, id. t. c. p. 175, Senegambia.

Gyna colini, id. t. c. p. 176, Senegambia.

Myiacris antiquum, Scudder, Mem. Bost. Soc. iii. p. 300, Mazon Creek, Lucifugum, p. 301, pl. xxvii. fig. 8, Pennsylvania, *carbonum*, p. 304, figs. 6, 7, & 10, Pennsylvania, *priscovolans*, p. 307, fig. 9, Pennsylvania, *ovale*, p. 308, fig. 5, Pennsylvania ; all Carboniferous fossils.

Blattina mathildae, Geinitz, Arch. Ver. Mecklenb. xxxvii. p. 29, pl. vi. fig. 1, *nana*, p. 30, pl. vi. fig. 2, fossil in Lias of Mecklenburg.

MANTIDÆ.

POTTS, T. H. Notes on a native species of *Mantis* ; with a descriptive note by Prof. Hutton. Tr. N. Z. Inst. xvi. pp. 114–118.

Detailed notes on the habits of a New Zealand species, with a short description (by Hutton, p. 118), but the insect is left unnamed.

WOOD-MASON, J. On the *Mantis metallica* of Westwood. Ann. N. H. (5) xiii. pp. 34–37.

Notes on a second example of this species from the North Cachar Hills. The insect belongs to St l's family *Harpagid *, and forms a new genus allied to *Odontomantis* and *Antissa* ; the author proposes the generic term *Nemolha* (p. 35), and characterizes both genus and species in detail.

Mantis religiosa in captivity. Notes on this subject are given by Wat-

tebled, Feuill. Nat. xiv. p. 55 : the food was raw meat, pieces of fruit, &c. ; it was excessively fond of milk ; it also caught flies. Frey-Gessner, t. c. p. 20, found that specimens held by the wings greedily devoured other *Orthoptera* if presented to them ; in captivity they fight greatly, the strongest example killing all the others.

New genera and species :—

Discothera, g. n., Bonnet & Finot, Bull. Soc. Ent. Fr. (6) iv. p. xxvi. Between *Paraoxyphilus* and *Amorphoscelis*. *D. tunetana*, sp. n., *ibid.*, Tunis.

Nemotha, g. n., Wood-Mason [*vide supra*].

Necrosia moderata, sp. n., Kirby, Ann. N. H. (5) xiii. p. 477, woodcut, Amboina.

Oxyophthalmus savatieri, sp. n., Rochebrune, Bull. Soc. Philom. (7) vii. p. 176 (1883), Senegambia.

Polyspilota gasconi, sp. n., *id. op. cit.* viii. p. 29, Senegambia.

PHASMATIDÆ.

BRONGNIART, C. Sur un gigantesque Neurorthoptère provenant des terrains houillers de Commentry (Allier). C.R. xviii. pp. 832 & 833.

Concerns the discovery of an enormous Carboniferous fossil insect to which the author gives the name of *Dictyoneura goldenbergi*, and another termed *D. fayoli*. The author considers that the "Phasmiens" were represented in the Carboniferous epoch by enormous insects of analogous type, but differing in the wings, the "Protophasmiens," and of a group already designated *Palaodictyoptera* by Goldenberg. These ancient insects were not less than 50 cm. long, with 70 cm. of expanse of wings.

The subject is also alluded to in Bull. Soc. Ent. Fr. (6) iv. pp. cli.-cliiv., and *Archaeoptilus ingens*, Scudder, is there transferred by Brongniart to *Dictyoneura* according to more perfect materials (*cf.* also Le Nat. ii. p. 474).

Bolívar, Viaje al Pacífico, redescibes the following :—*Bacunculus spatulatus*, Burm., *Phocylides tithonus*, Gray, p. 27, and *Phasma perezii*, B., p. 28.

Bacillus rossii. Horváth, Rov. Lapok, i. pp. 126 & xvi., gives notes on this species.

McCoy, Prodr. Z. Vict. dec. viii., figures *Acrophylla violasceus*, Leach, pl. lxxix., and *Podacanthus typhon*, Gray, pl. lxxx. (1883).

Cyphocrania maclayi, p. 710, and *lobiceps*, p. 711, spp. nn., Macleay, P. Linn. Soc. N. S. W. ix., Macleay Coast, New Guinea.

GRYLLIDÆ.

AYERS, H. On the Development of *Æcanthus niveus* and its parasite *Teleas*. Mem. Bost. Soc. iii. pp. 225-281, pls. xviii.-xxv. [Abstr. in J. R. Micr. Soc. (2) iv. pp. 553 & 554.]

1834. [VOL. XXI.]

BRUNER, L. Two new *Myrmecophilæ* from the United States. *Canad. Ent.* xvi. pp. 41-43, woodcuts.

Commences with notes on the habits of the genus, &c.

HORVÁTH, G. Sur l'évolution de l'*Æcanthus pellucens*. *Rev. Lapok*, i. pp. 8-14 (Hungar.), pl. i., & p. ii. (Fr.).

This insect is an enemy of the vine; the author discovered the eggs laid in the pith of the shoots, their presence being indicated by a series of holes externally; they hatch the beginning of June; there is one brood in the year. The observation confirms that made by Salvi in 1750. At pp. 60 & 61 the same author gives notes on the eggs as laid in the pith of *Syringa vulgaris*, with a list of Hungarian vernacular names.

Bolivar, Viaje al Pacifico, redescrives *Scapteriscus didactylus*, Scudd., p. 106, *Nemobius fasciatus*, D. G., p. 107, *Hemigryllus krieckbaumeri*, Saus., p. 108, *Gryllus capitatus*, Saus., p. 109, *fulvipennis*, Blanch., p. 110, *Eneopterus surinamensis*, D. G., p. 111.

New species :—

Lissoblemmus praticola, Bolivar, C.R. ent. Belg. 1884, p. cvi., Tangier.

Miogryllus argyropterus, Rochebrune, Bull. Soc. Philom. (7) vii. p. 176 (1883), Senegambia.

Gryllotalpa colini, *id. op. cit.* viii. p. 30, Senegambia.

Myrmecophila pergandei, Bruner, *Canad. Ent.* xvi. p. 42, Atlantic States, *oregonensis*, p. 43, Oregon.

LOCUSTIDÆ.

BORMANS, A. DE, & MARQUET, C. Note complémentaire sur une espèce du genre *Dolichopoda* (Bolivar), de la famille des Locustaires. *Bull. Soc. Toulouse*, xvii. pp. 225-228.

Includes a synopsis of this cave-frequenting genus, with remarks on the special habits and affinities. All the species, and the male of *D. bormansi*, Brunner, in detail, p. 229.

CHIMKÉVITSCH, V. Métamorphose de *Systachus nitidulus*, parasite des Orthoptères du genre *Stauronotus*. *Hor. Ent. Ross.* xviii. pp. 11-16 (in Russian).

LUCAS, H. Note sur deux nouvelles espèces du genre *Eugaster*, Orthoptères sauteurs de la famille des Locustides. *Ann. Soc. Ent. Fr.* (6) iv. pp. 156-164, pl. vii.

The descriptions are preceded by a list of 11 previously known species.

Copiophora cornuta in hothouses in Britain. J. O. Westwood notices several instances of the occurrence of this Brazilian insect, and figures both sexes; *Gard. Chron.* (2) xxii. p. 212.

Phaneroptera fulcata, Scop., in England; P. B. Mason, *Ent. M. M.* xx. p. 186 [*cf. Zool. Rec.* xx. *Ins.* p. 274].

Dinarchus dasypus, Illiger. Remarks on specimens from Bulgaria; Lucas, Bull. Soc. Ent. Fr. (6) iv. p. xxxvi.

Saga serrata in Hungary; C. Chyzer, Rov. Lapok, i. pp. 172 & xxiii., and G. Entz, t. c. pp. 251 & xxx.

Ocnerodes brunneri, Bolivar. The male described; Bormans, Bull. Soc. Toulouse, xvii. p. 229.

Antaxius kraussi, Brunner (nec Bolivar), renamed *hispanicus*; Bolivar, C.R. ent. Belg. 1884, p. civ.

Conocephalus. Bolivar, Viaje al Pacífico, pp. 87-93, gives a tabular, and in part diagnostic, list of nearly 40 described species. Those indicated by Walker are omitted as being indeterminable.

Bolivar, Viaje al Pacífico, enumerates and describes the following:—*Cosmophyllum olivaceum*, Blanch., p. 52, *Parableta integricauda*, Brunn., p. 53, *Olenophlebia difformis*, Brunn., p. 54, *Phylloptera famula*, Brunn., p. 55, *ovalifolia*, Burm., p. 56, *Syntechna olivaceo-viridis*, Brunn., p. 57, *Peucestes striolatus*, Brunn., p. 58, *Possidippus brunnerii*, B., p. 59, *Brisilis gladius*, B., p. 60, pl. ii. fig. 2, *Platyphyllum consanguineum*, Serv., p. 62, *Acanthodis speculifera*, B., p. 63, *Cratonotus* (genus redescribed) *armatus*, B., p. 67, pl. i. fig. 8, *isernii*, B., p. 68, pl. ii. fig. 3, *Cocconotus* (redescribed) *amorii*, B., p. 72, pl. iii. fig. 2, *differens*, B., p. 74, pl. iii. fig. 1, *adustus*, B., p. 75, pl. ii. fig. 5, *Jminezia* (redescribed) *elegans*, B., p. 79, pl. ii. fig. 6, *Leptotettix pubiventris*, B., p. 80, *Martinezia* (redescribed) *cuspidata*, B., p. 84, pl. ii. fig. 7, *Bucrates cocanus*, B., p. 85, pl. iii. fig. 4, *Conocephalus rugosicollis*, B., p. 93, *heteropus*, B., p. 94, *occidentalis*, Saus., p. 96, *cocanus*, B., p. 97, *scudderi*, B., p. 98, *subulatus*, B., p. 99, pl. iii. fig. 5, *pichinchæ*, B., p. 100, *irroratus*, Burm., p. 101, *crassus*, B., p. 102, pl. iii. fig. 6.

New genus :—

Pseudancistrus, g. n., Bolivar, Viaje al Pacífico, p. 82, footnote. Differs from *Polyancistrus*, Serv., by the brevity and form of the elytra, the robust femora, and the disposition of the spines, &c. *P. gundlachii*, sp. n., *ibid.* pl. iii. fig. 3, Cuba.

New species :—

Conocephalus gracilipes, Bolivar, Viaje al Pacífico, p. 87, footnote, Surinam, *sobrinus*, p. 88, Java, *ensiferus*, p. 88, pl. ii. fig. 9, Peru, *javanicus*, p. 88, Java, *princeps*, p. 89, Java, *australis*, p. 90, New Caledonia, *ichneumoneus*, p. 90, pl. ii. fig. 10, Brazil, *puiggarii*, p. 91, pl. ii. fig. 8, Brazil.

Agracia bipunctata, *id.* t. c. p. 103, pl. iii. fig. 7, Rio Napo, *nigrovittata*, p. 105, pl. iii. fig. 8, Ecuador.

Rhacocleis parvula, Costa, Atti Acc. Nap. (2) i., Sardinia.

Eugaster revoili, Lucas, Ann. Soc. Ent. Fr. (6) iv. p. 157, pl. vii. figs. 1-7, Somali country, *durandi*, p. 161, pl. vii. figs. 8-15, Zambesi.

Ephippiger oudryanus, Bonnet & Finot, Bull. Soc. Ent. Fr. (6) iv. p. 27, Tunis; *E. balearica*, Bolivar, C.R. ent. Belg. 1884, p. cvi., Mallorca; *E. coronata*, Costa, Atti Acc. Nap. (2) i., Sardinia.

ACEYDIIDÆ.

BETTA, E. DE. La Cavalette in provincia di Verona nel 1883. *Atti Ist. Venet.* (6) ii. pp. 106-108.

Chiefly statistical, showing the times of appearance in different communes, the approximate number seen and destroyed, &c.

BOLIVAR, I. Monografía de los Pirgomorfinos. *AN. Soc. Esp.* xiii. pp. 1-73 & 420-500, pls. i.-iv.

The introductory portion enters into an examination of the *Pyrgomorphidæ* (Brunner, = *Phymatidæ*, Stål.) as regards structural characters, bibliography, distribution, &c. The author tabulates 11 "sub-tribes," viz. :—*Ommexechæ*, *Chrotogonæ*, *Systellæ*, *Atractomorphæ*, *Pyrgomorpha*, *Sphenarice*, *Pacilocerce*, *Phymatæ*, *Petusiæ*, *Pamphagodæ*, and *Aspidophymæ*, which include 121 species in 37 genera. Nearly all the species are diagnosed, and also tabulated under each genus. The memoir concludes with a list of species, and explanation of the plates, on which the numbering of the figures is continuous, and many of the figures are from already described species, mostly in details of external anatomy.

BRUNER, L. Observations on the Rocky Mountain Locust during the summer of 1883. *Bull. Dep. Agric. Ent.* iv. pp. 51-62.

Many "native" species are alluded to in addition to *Caloptenus spretus*.

SAUSSURE, H. DE. *Prodromus Œdipodiorum, insectorum ex ordine Orthopterorum.* *Mém. Soc. Phys. Genève.* xxviii. No. 9, pp. 1-254, 1 pl. and woodcuts.

Pp. 5-38 are occupied by generalities on the external anatomy of the insects, including a minute discussion of the organs of flight (explained by woodcuts), and a comparative table of the nomenclature of nervures, &c., as used by different authors. Then follows (pp. 39 & 40) a discussion of the "tribe" *Œdipodii*, which is considered very closely allied to the *Tryxalii*, the two forming the "family" *Œdipodidæ*. Pp. 41-63 (with some corrections and emendations at pp. 154 & 192) consist of a generic table in which the "tribe" is divided into 3 "stirpes," viz. :—*Œdipoda*, *Thrinacus*, and *Eremobia*. The rest of the memoir (excepting the concluding bibliography and index) concerns the details of genera and species, many in both categories being new, and tables of species are given under each genus. All the species noticed either briefly or in detail by characters, with synonymy, &c.; space will only allow of those being noticed here that are indicated as new. The plate is chiefly occupied by neural details. The method of classification adopted is that of Stål, but with important modifications.

TOWNSEND, C. H. T. On the courtship of the sexes in *Œdipoda carolina*. *Canad. Ent.* xvi. pp. 167 & 168.

Pachytylus cinerascens, F., captured in Kerry, Ireland; H. N. Ridley, *Ent. M. M.* xx. p. 215. *P. migratorius*, L., in Finland, lat. 62° 40' N., on October 6th, 1883; Sahlberg, *Ent. Tidskr.* v. p. 169.

A large species of this family from the Kalahari Desert, S. Africa,

said to be used as food by the natives, noticed by J. J. Weir, P. E. Soc. 1884, p. xxvii.

Many species of this family destructive to cranberries in the United States are noticed by J. B. Smith, in Bull. Dep. Agric. Ent. iv. pp. 30 & 31. It is recommended to turn in a flock of turkeys where the insects abound.

Bolívar, Viaje al Pacifico, redescribes the following:—*Mastax personata*, B., p. 30, *minuta*, B., p. 31, *Tropidonotus discoideus*, Serv., p. 32, *Eleochochloa viridicincta*, Serv., p. 33, *picticollis*, Gerst., p. 34, pl. i. fig. 4, *Rhomalea speciosa*, Thbg., p. 35, *Zonipodu tarsata*, p. 36, *picta*, B., p. 37, *Thrasysderes* (genus redescribed) *leprosus*, p. 40, pl. i. fig. 5, *Lophacris humboldtii*, Scud., p. 42, *cristata*, L., p. 43, *Antandrus viridis*, Blanch., p. 44, *Pezotettix antisanae*, B., p. 45, *Teratania surinama*, L., 49, *Leptysmu filiformis*, Serv., p. 50, *celopterna*, D. G., p. 51.

New genera, &c. :—

Chortophaga, Saussure, t. c. p. 72, = *Trigocephala*, Harris, preocc., = *Chimarocephala*, Scud., *partim*. Includes *Acryd. viridifasciata*, D. G., *C. brevipennis*, Scud., and *T. cubensis*, Scud.

Pardalophora, subg. of *Hippiscus*, id. t. c. p. 83. Includes *Æ. haldmanni*, Scud., *H. (P.) nanus*, sp. n., p. 86, Colorado, *H. lineatus*, Scud., *Æ. phænicopterus*, Burm., and *Acryd. tuberculatum*, P. d. B.

Xanthippus, id. t. c. p. 88. Allied to *Hippiscus*; differs in the form of the antennæ of the ♂, and by the suppression of the pronotal keel in the ♀. Includes *Æ. corallipes*, Hald., *pardalina*, Sauss., ? *Leprus ingens*, Scud., *Æ. neglecta*, Th., and the following spp. nn.: *zapotecus* (*pardalina* var. ?), p. 91, *toltecus*, *ibid.*, and *leprosus*, p. 92, all from Mexico, *lateritius*, p. 92, *calihulus*, p. 93, and *vitellinus*, p. 94, all from Nevada.

Phrynotettix, id. t. c. p. 99 (cf. table at p. 47 for generic details). For *P. rana*, sp. n., *ibid.*, Chili.

Pappus, id. t. c. p. 100 (cf. pp. 11, 12, & 48 for details). For *P. patagonus*, sp. n., *ibid.*, Patagonia.

Papipappus, id. t. c. p. 101 (cf. pp. 11, 12, & 48). For *P. clarazianus*, sp. n., *ibid.*, Patagonia.

Gastrimargus, subg. of *Edaleus*, id. t. c. p. 110. For *Æ. (G.) verticalis*, sp. n., p. 111, Natal, *Gryllus marmoratus*, Thbg. (divided into *marmoratus* and *sundaeus* as forms), *Æ. wahlbergii*, Stål, *acutangulus*, Stål, *sarasini*, sp. n., p. 114, New Caledonia, *Ædip. subfasciatus*, Haan, and *madecassus*, sp. n., p. 115, Madagascar.

Scimtharista, id. t. c. p. 121. Allied to *Pachytylus*. For *S. brunneri*, sp. n., p. 121, Persia and Armenia, *Æ. venusta*, Fieb., and *Æ. wagneri*, Eversm.

Entlopternis, id. t. c. p. 125 (cf. table, p. 52). For *D. coulöniana*, p. 125, Guinea, *ceylonica*, p. 126, Ceylon, and *zebrata*, *ibid.*, India, spp. nn.

Pternoscirta, id. t. c. p. 127, = *Prionidia*, Stål, preoccupied.

Celes, id. t. c. p. 131 (cf. table, p. 53). For *Gryllus variabilis*, Pallas.

Chlæbora, id. t. c. p. 132. Between *Edaleus* and *Pynodictya*. For *C. grossa* and *bramina*, p. 133, India, spp. nn.

Pietica, id. t. c. p. 133. For *P. cristulata*, *ibid.*, sp. n., Turkestan.

Conistica, subg. of *Dissoteria*, Saussure, *t. c.* p. 135. For *D. saucia*, Stål.

Scirtetica, subg. of *Dissoteria*, *id. ibid.* For *Æ. marmorata*, Uhler, and *Trimerotropis picta*, Scud.

Lactista, *id. t. c.* p. 142. Between *Dissoteria* and *Ædipoda*. For *Æ. punctatus*, Stål, and *L. gibbosus*, p. 143, California, *pulchripennis*, *ibid.*, Columbia, and *pellepidus*, p. 144, Yucatan, spp. *nn.*

Tmetonotu, *id. t. c.* p. 159 (*cf. table*, p. 56). For *Triloph. rugosa*, Stål.

Conozoa, *id. t. c.* p. 164. Between *Psnidia* and *Trimerotropis*. For *P. sulcifrons* and *wallula*, Scud., and *C. behrensi*, sp. *n.*, p. 165, California.

Rhodorrhipis, subg. of *Bryodema*, *id. t. c.* p. 179. For *Æ. gebleri*, Fisch.

Thalpomenus, *id. t. c.* p. 184. Much allied to *Sphingonotus*. For *Æ. algeriana*, Lucas, and *T. persa*, p. 185, Persia, and *ledereri* (Brun.), *ibid.*, Asia Minor, spp. *nn.*

Conipoda, *id. t. c.* p. 192. Between *Acrotylus* and *Sphingonotus*. For *C. calcarata*, sp. *n.*, p. 193, Madagascar, and var. from Senegal.

Helioscirtus, *id. t. c.* p. 194. Allied to *Sphingonotus*. For *H. moseri*, sp. *n.*, p. 195, Turkestan, and var. from Persia.

Leptopternis, subg. of *Sphingonotus*, *id. t. c.* p. 209. For *Æ. gracilis*, Eversm., *S. imitans*, Brun., and *Æ. clausii*, Kittary.

Heliasius, *id. t. c.* p. 212 (*cf. p.* 193). For *Æ. sumichrasti*, Saus., and *H. venezuelæ*, p. 213, Venezuela, Panama, *aztecus*, p. 214, Mexico, and *obesus*, *ibid.*, Brazil?, spp. *nn.*

Pycnostictus, *id. t. c.* p. 215 (*cf. p.* 193). For *P. seriatus*, sp. *n.*, *ibid.*, New Holland.

Demonea, *id. t. c.* p. 217. An abnormal genus for the stirps *Ædipoda*. For *D. arieticeps*, sp. *n.*, p. 218, Peru.

Eremoplana, *id. t. c.* p. 232. Very closely allied to *Eremobia*. For *E. cinerascens*, Stål.

Eremocharis, *id. t. c.* p. 233. Allied to *Eremoplana*. For *E. subsulcata*, Stål.

Batrachornis, *id. t. c.* p. 234. With the facies of *Prisopus*. For *B. perloides*, sp. *n.*, p. 235, Cape of Good Hope.

Spathalium, Bolivar, An. Soc. Esp. xiii. p. 30 (*Ommexechæ*). Includes *Ommexecha sommeri*, Burm., *audouini*, *macropterum*, and *cyanopterum*, Blanch., *Gryllus serrulatus*, Thunb., and *S. stalii*, p. 32, fig. 2, San Leopoldo, sp. *n.*

Caconda, *id. t. c.* p. 36 (*Chortogonæ*). *C. fusca*, *id. t. c.* p. 37, Angola, sp. *n.*

Desmoptera, *id. t. c.* p. 57 (*Systellæ*). For *Acridium novæ-guinææ*, Haan, and *D. judicata*, p. 58, fig. 5, Moluccas, sp. *n.*

Deraspis, *id. t. c.* p. 61 (*Atractomorphæ*). *D. volxemi*, p. 62, fig. 6, America?, sp. *n.*

Phymaptera, *id. t. c.* p. 62 (*Atractomorphæ*). *P. jucunda*, *ibid.*, Porto Cabello, sp. *n.*

Parasphena, *id. t. c.* p. 436 (*Pyrgomorphæ*). For *Sphenarium pulchripes*, Gerst., and *P. pictu*, p. 437, fig. 10, Massana, sp. *n.*

Orthacris, *id. t. c.* p. 433 (*Sphenariæ*). *O. filiformis*, *ibid.*, Ceylon, sp. *n.*

Sphenacris, Bolivar, *t. c.* p. 441 (*Sphenariæ*). *S. crassicornis*, *ibid.*, locality unknown, sp. n.

Xyronotus (Saussure, MS.), *id. t. c.* p. 442 (*Sphenariæ*). *X. aztecus* (Sauss.), *ibid.* fig. 12, Mexico, sp. n.

Prospheua, *id. t. c.* p. 446 (*Sphenariæ*). *P. scudleri*, p. 447, Guatemala, sp. n.

Peristegus, *id. t. c.* p. 469 (*Phymateæ*). For *Gryllus squarrosus*, L.

Parapetasia, *id. t. c.* p. 484 (*Petusiæ*). *P. femorata*, p. 485, fig. 28, Gaboon, sp. n.

Aspidophyma, *id. t. c.* p. 491 (*Aspidophymæ*). For *A. indica*, *ibid.*, Ceylon, and *americana*, p. 492, fig. 32, Ecuador, spp. nn.

Finotia, Bonnet, Le Nat. ii. p. 548 (*Pamphagidæ*). *F. spinicollis*, sp. n., *ibid.*, Tunis.

New species :—

Arphia granulata, Saussure, *t. c.* p. 67, Florida, *fallax*, p. 69, Guatemala, *infernalis*, p. 70, Texas, *behrensi*, p. 71, California and Mexico.

Leprus corpulentus, *id. t. c.* p. 96, Mexico.

Tomonotus orizabæ, *id. t. c.* p. 98, Texas, Mexico, Guatemala.

Edaleus (B.) *infernalis*, *id. t. c.* p. 116, Amur.

Pachytylus capensis, *id. t. c.* p. 119, Cape of Good Hope, *capito* (= *migratoroides* var. ?), p. 120, Madagascar ; *P. mlokoziowitzcki*, Bolivar, C.R. ent. Belg. 1884, p. cv., Tiflis.

Dissoteira (D.) *spurcata*, Saussure, *t. c.*, California, *D. (Sphragemon) texensis*, p. 140, Texas.

Edipoda miniata var. n. *cærulea*, *id. t. c.* p. 150, locality uncertain, *fedtschenki*, p. 150, Turkestan, *schochii* (Brun.), p. 153, Syria.

Derotmena brunnerianum, *id. t. c.* p. 155, Colorado, *rileyianum*, p. 156, Idaho.

Psinidia (*Trachyrhacis*) *pardalina*, *id. t. c.* p. 162, Colorado, *maculosa*, *ibid.*, N. America.

Trimerotropis laticincta, *id. t. c.* p. 169, Texas, *monticola*, p. 170, Mexico, *fallax*, *ibid.*, California, *pristrinaria*, p. 173, Texas.

Circotettix thalassinus, *id. t. c.* p. 177, Nevada.

Bryodema (B.) *brunneriana*, *id. t. c.* p. 180, Hong Kong, *inda*, p. 181, India.

Acrotylus crassus, *id. t. c.* p. 187, Africa ?, *hottentotus* (= *concinna*, Serv. ?), p. 188, Cape of Good Hope, *humbertianus*, p. 189, Ceylon and S. Africa, *blondeli*, p. 191, Senegal.

Sphingonotus (S.) *sutrapes*, *id. t. c.* p. 199, Turkestan and Persia, *capensis*, p. 201, S. Africa, *jamaicensis*, p. 202, Jamaica, *longipennis*, p. 203, no locality, *indus*, p. 204, Himalaya, *persæa*, p. 205, Persia, *amaranthinus*, p. 206, Aden, *brunneri*, *ibid.*, Asia Minor ?, *apicalis*, *ibid.*, Persia, *kittaryi*, p. 207, Turkestan, *savignyi*, p. 208, Egypt, &c.

Eremobia tartara, *id. t. c.* p. 229, Turkestan, *cyanipennis*, p. 232, Central Asia.

Batrachotettix elephas and *hottentotus*, *id. t. c.* p. 237, Cape of Good Hope, *loricatus*, p. 238, uncertain, *pistrinarius*, p. 238, S. Africa, *stolii*, p. 239, S. Africa.

Ommexecha brunneri, Bolivar, An. Soc. Esp. xiii. p. 28, Peru.

Chortogonus bormansi, *id. t. c.* p. 39, Schoah, *micropterus*, p. 40, Angola, *fumosa*, p. 42, "Monomotapa," *scudderi*, p. 43, Nile, *savignyi* (Blanch.), *ibid.*, Egypt, *incertus*, p. 45, China, *saussurei*, p. 47, India.

Atractomorpha gerstaeckeri, *id. t. c.* p. 66, Gaboon, Zanzibar, Calcutta, *aurivillii*, p. 67, fig. 8, Caffraria and Formosa, *similis*, p. 68, Moluccas and Andamans, *bedeli*, p. 69, Japan.

Pyrgomorpha squalina (Sauss.), *id. t. c.* p. 423, India, *tricarinata*, p. 424, Brazil, *dispar*, p. 425, Mexico, *brachyptera*, p. 427, Aleppo and Tiflis.

Sphenarium borrei, *id. t. c.* p. 445, Guanajuato.

Phymateus brunneri, *id. t. c.* p. 464, Benguela, *hillebrandti* (Brun.), p. 466, Somali.

Taphronota stali, *id. t. c.* p. 473, Transvaal.

Maura apicalis, *id. t. c.* p. 479, Massaua, *rugulosa* (and var. *brevipennis*, fig. 27), p. 480, Angola.

Arcyptera tornosi (= *variegata*, Bol., partim), Bolivar, C.R. ent. Belg. 1884, p. civ., Spain.

Bryodema capsitana, Bonnet, Le Nat. ii. p. 548, Tunis.

Ctyhippus assumptio, Santos, J. Sci. Lisb., Portugal.

Dericorys millieri (Finot), Bonnet & Finot, Bull. Soc. Ent. Fr. (6) iv. p. xxvii., Tunis.

RHYNCHOTA.

BY

W. F. KIRBY, F.E.S., &c.

THE GENERAL SUBJECT.

BERG, C. Addenda et Emendanda ad *Hemiptera* Argentina. Bonariæ : 1884, 8vo, pp. 213.

Reprinted from An. Soc. Arg. xvi. & xvii.; the portion published for the first time in 1884 includes supplement and index (An. Soc. Arg. xvii. pp. 97-118 & 166-176).

*FAIRMAIRE, L. Histoire naturelle de la France. 2^e partie : Hémiptères (Punaises, cigales, pucerons, cochenilles). Paris : 8vo, pp. 206, pls. ix. [Cf. Le Nat. vi. pp. 535 & 536.]

FERRARI, P. M. Materiali per lo studio della Fauna Tunisina raccolti da G. e L. Doria. v. Rincoti. Ann. Mus. Genov. (2) i. pp. 439-522.

191 species enumerated, of which only the few new and the more important known can be mentioned here. Notes on the geographical distribution of some of the species are prefixed to the paper.

Short notes on the localities and synonymy of various *Hemiptera*; Puton, Rev. d'Ent. iii. pp. 147-149.

Various *Hemiptera-Heteroptera* which prey upon *Coccidæ* noticed and figured; Goethe, JB. nass. Ver. xxxvii. pp. 129 & 130, pl. iii. figs. 68-75.

List of *Hemiptera* taken near Hastings; Collett, Ent. M. M. xx. p. 190.

Additions to the list of Belgian do.; Lethierry, C.R. ent. Belg. xxviii. pp. cxxvi., cxxvii., cclix., & cclx.

List of *Hemiptera* collected at Aguilas, Spain, by Weyers; *id. t. c.* p. ccliv.

List of 12 *Rhynchota* (2 new) collected by the late W. A. Forbes on the Lower Niger; Distant, P. Z. S. 1884, pp. 458-461.

HEMIPTERA-HETEROPTERA.

DISTANT, W. L. Biologia Centrali-Americana [*vide* Godman & Salvin, *Insecta*, General Subject]. *Rhynchota Heteroptera*, pp. 265-304, pls. xxiv.-xxviii.

Extends from *Paralocoris* to the conclusion of *Capsidæ*, and one page of Supplement.

FOKKER, A. J. F. Catalogus der in Nederland voorkomende *Hemiptera*. Eerste Gedeelte: *Hemiptera-Heteroptera*, No. 2. Tijdschr. Ent. xxvii. pp. 113-133.

Extends from *Lygæidæ* to *Saldidæ*. Several species are noticed as new to Holland.

KORSCHULT, E. Die Bildung des Chorions bei einigen Wasserwanzen. Zool. Anz. vii. pp. 500-504.

A supplement to a more general paper [cf. *anted*, p. 4].

LUCY, W. A. Observations on the pulsating organs in the legs of certain *Hemiptera*. Am. Nat. xviii. pp. 13-19, pl. i.

These organs were observed in *Corisa*, *Notonecta*, *Gerris*, *Belostoma*, *Penthostoma*, and *Ranatra*. They are separate from the muscular system of the legs, and influence circulation.

PARFITT, E. The Fauna of Devon. *Hemiptera-Heteroptera*, or Plant Bugs. Tr. Devon. Ass. xvi. pp. 749-774.

160 species enumerated. The introductory remarks relate to marine and fossil insects; economic importance of *Heteroptera*; pupa-cases of *Notonecta glauca*; maternal affection of *Acanthosoma griseum*; introduction of *Cimex lectularius* from America, &c.

REUTER, O. M. Finlands och den Skandinaviska Halföns *Hemiptera-Heteroptera*. Ent. Tidskr. v. pp. 173-185.

Includes *Phymatidæ*, *Reduviidæ*, and commencement of *Acanthiidæ*.

—. Ad cognitionem Heteropterorum Africæ occidentalis. Öfv. Fin. Soc. xxv. pp. 1-43.

83 species mentioned; many new genera and species described. The short notes on known species are generally unimportant.

WESTHOFF, F. Verzeichniss bisher in Westfalen aufgefundenen Arten aus der Gruppe *Hemiptera-Heteroptera*. 3ter Artikel. JB. westf. Ver. xii. pp. 33-46.

Includes the families *Lygæidæ* to *Macropeltidæ*, the usual order being reversed. A comparative table of the number of species of each family found in Westphalia and in the Netherlands is prefixed; the total number of *Heteroptera* from Westphalia is 301, and from the Netherlands 278. The list of species includes remarks on localities.

Podiscus crocatus, Uhl. (MS.), and *Neides muticus*, Say, destructive to *Pieris menapia*, Feld.; Hagen, Canad. Ent. xvi. p. 40.

Hebrus ruficeps, Thoms., *Mesovelia furcata*, Muls., and *Gerris lateralis*, Schumm., noticed as new to Hungary; Horváth, Rov. Lapok, i. pp. 187, 188, & xxiv.

Bug destructive to the honey-bee in S. Brazil; Breitenbach, Ent. Nachr. x. p. 42.

Additions to the list of *Hemiptera-Heteroptera* of Dulwich; Wood & Pim, Rep. Dulwich Soc. vi. p. 54.

List of do. captured at Babia in 1879 & 1880, with tables of distribution; Stobieckiego, Sprawozd. Kom. fizyogr. xvii. pp. 8-15.

Additions to the list of *Hemiptera-Heteroptera* of Galicia; Lomnicki, Sprawozd. Kom. fizyogr. xviii. pp. 204-206.

List of do. of the Balkans and the Dobrudscha; Horváth, C.R. ent. Belg. xxviii. pp. cxiv.-cxvi.

PENTATOMIDÆ.

JACOVLEFF, W. *Hemiptera-Heteroptera* des Astrachanischen Gebietes. Hor. Ent. Ross. xviii. pp. 141-243.

This paper includes a full monograph of the families *Plataspidae*, *Scutelleridae*, and *Pentatomidæ*, in Russian, with Latin diagnoses; but only one new genus is added. The following synonymy occurs:—*Coptosoma dilatata*, Motsch. (= *Cimex globus*, Fabr.), *Arctocoris lunatus*, Pall. (*Prachycoris maculiventris*, Germ., *Irochrotus hirtus*, Fieb., and *A. villosus*, Herr.-Schäff.), *Odontoscelis fuliginosa*, Linn. (= *Cimex litura*, Fabr., and *O. dorsalis*, Fieb.), *O. dorsalis*, Fabr. (= *Arctocoris plagiatus*, Germ., and *O. komaroffi*, Jak.), *Odontotarsus grammicus*, Linn. (= *Bellocoris purpureolineatus*, Hahn), *Psacasta neglecta*, Herr. Schäff. (= *Tetyra granulata*, Costa), *P. exanthematica*, Scop. (= *Tetyra pedemontana*, Fabr., and *P. allioni*, Fieb.), *Eurygaster maura*, Linn. (= *Tetyra picta*, Fabr.), *E. hottentota*, Fabr. (= *Cimex fuscus*, Gmel.), *E. dilaticollis*, Dohrn (= *brevicollis*, Fieb.), *Graphosoma lineatum*, Linn. (= *Scutellera nigrolineata*, Herr.-Schäff.), *Tholagmus flavolineatus*, Fabr. (= *Tetyra strigata*, Herr.-Schäff.), *Tarisa virescens*, Herr.-Schäff. (= *pallescens*, Jac.).

SIGNORET, V. Groupe des Cydnides. 11^e-13^e parties. Ann. Soc. Ent. Fr. (6) iii. pp. 357-374, & 517-534, pls. ix., x., xv., & xvi., and iv. pp. 45-62 & 117-128, pls. ii. & iii.

Extends from *Brachypeltus* to end, with index of genera and species. The following known species are redescribed and figured:—*Brachypeltus aterrimus*, Forst. (= *niger*, De Geer, *tristis*, *sanguinicollis* and *brunni-pennis*, Fabr., *carbonarius*, Fourcr., *spinipes*, Schrank, and *clavata*, Uhl.), fig. 196, *Cydnopeltus horvathi*, Sign., fig. 187, *Hiverus torridus*, Er. (= *hirtus*, A. & S.), fig. 188, pl. ix., *Pachymerus bolivari*, Sign., fig. 191, *Amnestus spinifrons*, Say, fig. 192, *glabratus*, Stål, fig. 195, *lautipennis*, Stål (neo Berg), fig. 196, *pusillus*, Uhl., fig. 197, *subferrugineus*, Hope, fig. 198, pl. x., and *pusio*, Stål, fig. 199, *Chilocoris nitidus*, Mayr, *ritzema*, Sign., fig. 200, *Peltoxys brevipennis*, Fabr. (= *pubescens*, Sign.), fig. 203, *Macrhymenus membranaceus*, Sign., fig. 204, *Microrhynchus beccarii*, Sign., fig. 205, pl. xv., *Amaurocoris laticeps*, Stål (= *Eurycoris niger*, Sign.), fig. 206, *Lobonotus anthracinus*, Uhl., fig. 208, *Gnathoconus albomarginatus*, Fabr., fig. 209, *melaleucus*, Thunb., fig. 210, *tibialis*, Stål, fig. 211, pl. xvi., and *picipes*, Pall. (= *fumigatus*, Cast., *costalis*, Fieb., *picipes* and *concolor*, Muls. & Rey, and *cyaneonitens*, Ferr.), fig. 212, *Croci-stethus wulfilii*, Fieb. (= *areus*, ♂, and *Ochetostethus basalis*, Fieb.), fig. 213, *Adomerus biguttatus*, Linn., fig. 214, *Tritomegas bicolor*, Linn. (= *nubilosa*, Harr.), fig. 217, *sexmaculatus*, Ramb. (= *rotundipennis*, Dohrn), *Sehirus morio*, Linn. (= *affinis* and *ovatus*, Herr.-Schäff., and *parvus* and *luctuosus*, Muls. & Rey), fig. 218, *cypriacus*, Dohrn, fig. 219,

pl. ii., *maculipes*, Muls. & Rey (^p = congener, Jak.), fig. 120, *Canthophorus dubius*, Scop. (= *albomarginatus*, Schrank, *albomarginellus*, Burm., nec Fabr., and *melanopterus*, Herr.-Schäff.), fig. 221, *impressus*, Horv., fig. 222, *niveimarginatus*, Scott, fig. 223, *3-guttatus*, Motsch., fig. 226, *cinctus*, Beauv. (= *lygatus*, Say, and var. *albonotatus*, Dall.), fig. 227, and *Ochetostethus nanus*, Herr.-Schäff. (= *pygmaeus*, Ramb., *tarsalis*, Muls. & Rey, and *caduthus*, Amyot), fig. 228, pl. iii.

Reuter, Öfv. Fin. Soc. xxv. pp. 4-9, notes the following synonyms:—*Spheroecoris annulus*, Fabr. (= *argus*, Stål), *testudo-grisea*, De Geer (= *punctarius*, Stål), *Eusarcocoris inconspicuus*, Herr.-Schäff. (= *misella*, Stål), *Afrius purpureus*, Westw. (= *Canthecona yolofo*, Stål, and var. *marginella*, Dall).

Linospa (allied to *Amaurocoris*: type, *Cydmus hirtus*, Thunb., re-described and figured, p. 528, pl. xvi. fig. 207) and *Lalervis* (type, *Adomerus expansa*, Sign., figured, pl. ii. fig. 216), Signoret, fully characterized by him; Ann. Soc. Ent. Fr. (6) iii. p. 527, & iv. p. 148.

Berg, An. Soc. Arg. xvii. pp. 97-103, notes the following synonymy:—*Geotomus bergi*, Sign. (= *americanus*, Berg, nec Stål), *Amnestus lateralis*, Sign. (= *lautipennis*, Berg, nec Stål, and *subferrugineus*, Berg, nec Westw.), *Mutycia grandis*, Dall. (= *phymatophora*, Guér.), *Macropygium reticulare*, Fabr. (= *atrum*, Spin., *bifida*, Westw., *subsulcatus*, Amyot & Serv., *spinola*, Stål, and *guttipes*, Walk.), *Thyanta perditor*, Fabr. (= *fuscifera*, Beauv., *collaris*, Westw., *transversalis* and *dimidiatus*, Herr.-Schäff., *rubiginosus*, Dall., *fasciatus* and *adjunctor*, Walk.), and *Ditomotarsus gayi*, Spin. (= *punctiventris*, Spin., and *sanguiniventris*, Stål).

Clinocoris griseus, Linn. (= *Elasmostethus fieberi*, Jak.), and *interstinctus*, Linn. (= *Cimex betule*, De Geer, *alni*, Ström, *agathinus*, Fabr., *Acanthosoma griseum*, Flor. and *Elasmostethus griseus*, Fieb.), differentiated; Reuter, Rev. mens. Ent. i. pp. 131 & 132.

Odontarsus. Table of Russian species; Jakovleff, Bull. Mosc. lviii. (3) pp. 118 & 119.

Sternodontus obtusus, Muls. & Rey, var. *debilicostis* from Goritz, described; Puton, Rev. d'Ent. iii. p. 85.

Arma spinosa, Dall., destructive to larvæ of *Selandria barda*, Say; Osborne, Canad. Ent. xvi. p. 151.

Podisus modestus, Dall., destructive to larvæ of *Nematus erichsonii*, Hart.; Moffat, Canad. Ent. xvi. p. 215.

Cyrtomenus excavatus, Sign., and *teter*, Spin., are sexes; Distant, Biol. Centr. Am. Rhynch. Het. p. 304.

Carpocoris nigricornis, Fabr., var. from Tunis noticed; Ferrari, Ann. Mus. Genov. (2) i. p. 453.

Eurydema. Reuter, Rev. d'Ent. iii. pp. 68 & 69, gives the following synonymy:—*E. festiva*, Linn. (= *Cimex festivus*, Linn. & Müll., ? Fabr.; *Pentatoma picta*, Herr.-Schäff., and *Strachia picta*, Fieb. & Put.) *E. dominulus*, Scop. (= *Cimex dominulus*, Scop., *C. cordiger*, Goeze; *C. festivus*, Petagna, Don., Wolff); *E. ornata*, Sahlb., *E. daurica*, Motsch., and *S. festiva*, Fieb. & Put.), *E. fieberi*, Schumm. (= *Cimex dominulus*, Harrer, *Pentatoma fieberi*, Schumm., and *S. dominula*, Fieb. & Put.).

Rhaphigaster hilaris, Say, very injurious to cultivated trees and plants in Florida; Franklin, Bull. Dep. Agric. Ent. iv. pp. 81-83.

New genera and species :—

Asaroticus, Jacovleff, Hor. Ent. Ross. xviii. p. 227. Allied to *Leprosoma*. Type, *L. solskyi*, Jac.

Mesocricus, Horváth, Term. füzetek, viii. p. 315. Allied to *Pangæus*. Type, *M. cribripennis*, sp. n., *ibid.*, Syria.

Dearcla, Signoret, Ann. Soc. Ent. Fr. (6) iii. p. 363. Affinities doubtful, but with a superficial resemblance to *Brachypeltus* and *Cydnopeltus*. Type, *D. opercularis*, sp. n., t. c. p. 364, pl. ix. fig. 190, Simon's Bay.

Oncozygidea, Reuter, Öfv. Fin. Soc. xxv. p. 4. Allied to *Melanophora* and *Oncozygia*. Type, *O. flavitarsis*, sp. n., t. c. p. 5, Addah.

Cyclogastridea, *id.* t. c. p. 9. Allied to *Cyclogaster*. Type, *C. nigromarginalis*, sp. n., *ibid.*, Ashanti.

Agabotus, Distant, P. Z. S. 1884, p. 459. Intermediate between *Caystrus*, Stål, and *Anarrops*, Gerst. Type, *A. brunescens*, sp. n., t. c. p. 460, Lower Niger.

Odontotarsus angustatus, Turkestan, p. 120, *rugicollis*, Orenburg, p. 121, and *robustus*, Caucasus, p. 123, Jakovleff, Bull. Mosc. lviii. (3).

Brachyplatys incertus, Reuter, Öfv. Fin. Soc. xxv. p. 2, Addah.

Cydnus pallidipennis, *id.* t. c. p. 3, Addah.

Hiverus æneus, Signoret, Ann. Soc. Ent. Fr. (6) iii. p. 362, pl. ix. fig. 189, Albany, Australia.

Amnestus lateralis (= *lautipennis*, Berg, nec Stål). Buenos Aires, and *brunneus*, Mexico, *id.* t. c. pp. 369 & 370, pl. x. figs. 193 & 194.

Chilocoris piceus and *parumpunctatus* (Fieb., MS.), *id.* t. c. pp. 518 & 520, East Indies.

Adomerus marginatus, *id. op. cit.* (6) iv. p. 48, pl. ii. fig. 215, Syria.

Canthophorus steini, Sarepta, and *variegatus*, Japan, *id.* t. c. pp. 58 & 59, pl. iii. figs. 224 & 225.

Eusarcoris purpurissatus, Reuter, t. c. p. 6, Ashanti.

Durmia nigrispina, Addah, and *vittiventris*, Ashanti, *id.* t. c. pp. 7 & 8.

Eurydema nigriceps, *id.* Rev. d'Ent. iii. p. 67, Algeria.

Æthemenes forbesi, Distant, P. Z. S. 1884, p. 460, Lower Niger.

Banasa pulchella, Berg, An. Soc. Arg. xvii. p. 101, Uruguay.

Aspongopus annulatus, Reuter, Öfv. Fin. Soc. xxv. p. 10, Ashanti.

COREIDÆ.

HORVÁTH, G. v. Ueber *Centrocoris variegatus*, Kol., und seine Verwandten. Wien. ent. Z. iii. pp. 111-115.

Centrocoris, Fieb., = *Vilga*, Stål, and *Centrocarenus*, Fieb., = *Centrocoris*, Kol. *C. spiniger*, Fabr. (= *pallescent*, Kol.), and *variegatus*, Kol. (= *spiniger* var. *nigricans*, Fieb.), are redescribed, and the thoraces figured; and these and 4 allied species are tabulated.

Bardistus crenulatus, Stål, and *Sethenius testacea*, Spin. (= *Gonocerus angulatus*, Westw., and *latus*, Herr.-Schäff.), noticed; Berg. An. Soc. Arg. xvii. p. 104.

Enoplops bos, Dohrn, noticed from Tunis; Ferrari, Ann. Mus. Genov. (2) i. pp. 456 & 457.

Alydus calcaratus, Linn. (= *hirsutus*, Kol., and *atratus*, Motsch.) noticed; Reuter, Rev. mens. Ent. i. p. 132.

Mevanidea, g. n., Reuter, Öfv. Fin. Soc. xxv. p. 11. Allied to *Mevania* and *Clavigralla*. Type, *M. granulifera*, sp. n., t. c. p. 12, Addah.

Mevaniomorpha, g. n., id. t. c. p. 13. Next to last. Type, *M. annulipes*, sp. n., *ibid.*, Addah.

LYGÆIDÆ.

Pamera gracilis, Ramb. (= *Plociomera proxima*, Stål), and *Dieuches armipes*, Fabr. (= *Beosus albostrigatus*, Stål), noticed; Reuter, Öfv. Fin. Soc. xxv. pp. 17 & 26.

Nysius angustatus, Uhl. (= *destructor*, Riley), noticed as injurious to the strawberry; Forbes, Rep. Ins. Illin. xiii. pp. 104-106, pl. x. fig. 5.

Lygeus leucopterus, Goeze (= *Cimex familiaris*, Fabr., *stellifer*, Fourcr., *L. venustus*, Boeb., and *cruciger*, Motsch.), noticed; Reuter, Rev. mens. Ent. i. pp. 132 & 133. *L. (Hamobaphus) concinnus*, Dall.: malformation noticed; Ferrari, Ann. Mus. Genov. (2) i. p. 462.

Dinia, Stål, recharacterized, and species tabulated; Reuter, Öfv. Fin. Soc. xxv. pp. 22-24.

Emblethis, Fieb. Table of species; Horváth, Term. füzetek, viii. p. 13, note; Jakovleff, Bull. Mosc. lviii. (3) pp. 126 & 127.

Eremocoris, Fieb. European species noticed; Horváth, Math. Nat. Ber. Ung. i. pp. 173 & 174.

Micropus leucopterus, Say (Chinch Bug). Remarks on life-history and ravages, with figures of various stages; W. Saunders, Rep. Fruit-Growers' Ass. Ont. 1883, pp. 329-332, figs. 30 & 31, and Rep. E. Soc. Ont. 1883, pp. 5-62, figs. 30 & 31; Forbes, Rep. Ins. Illin. xiii. pp. 32-63, figs. 6 & 7; Lintner & Riley, Am. Nat. xviii. pp. 79 & 80.

|| *Anepsius*, Puton, renamed by him *Anepsiocoris*; Rev. d'Ent. iii. p. 79.

New genera and species :—

Hormopleurus, Horváth, Term. füzetek, viii. p. 9. Allied to *Graptostethus*, but forming a transition to *Lygæosoma*. Type, *H. nysioides*, sp. n., *ibid.*, Syria.

Alampes, id. t. c. p. 10. Allied to *Rhyparochromus*. Type, *A. longiusculus*, sp. n., *ibid.*, Morea.

Homoscelis, id. t. c. p. 11. Allied to *Tropistethus*. Type, *H. ruficollis*, sp. n., *ibid.*, Corfu.

Mesostates, Reuter, Öfv. Fin. Soc. xxv. p. 14. Apparently intermediate between *Nysius* and *Orsillus*. Type, *M. maculatus*, sp. n., t. c. p. 15, Addah.

Opistostenus, id. t. c. p. 16. Allied to *Cymophyes*. Type, *C. ochreipennis*, sp. n., t. c. p. 17, Addah.

Anepsiodes, id. t. c. p. 21. Allied to *Anepsius*. Type, *A. nitidus*, sp. n., t. c. p. 22, Addah.

Lamproceps, Reuter, *t. c.* p. 27. Placed after *Pœantius*. Type, *L. apicalis*, sp. n., *ibid.*, Addah.

Metastenothorax, *id.* Wien. ent. Z. iii. p. 1. Allied to *Pterotmetus*. Type, *M. punctatipennis*, sp. n., *t. c.* p. 2, fig., Greece.

Lygæus gibbicollis, Costa, Bull. Ent. Ital. xv. p. 338, Sardinia.

Lethæus fulvovarius, Puton, Rev. d'Ent. iii. p. 142, Syria.

Rhyparochromus longipilis, *id. t. c.* p. 312, Bône.

Piezoscelis pilosus, Signoret, Bull. Soc. Ent. Fr. (6) iv. p. lvi., Bahr-es-Salaam and Abyssinia.

Pionosomus heterotrichus, Horváth, Term. füzetek, viii. p. 11, Tauria.

Emblethis denticollis, *id. t. c.* p. 12, Hungary, S. Russia, Transcaucasia ; *E. tenellus*, Jakovleff, Bull. Mosc. lviii. (3) p. 124, Shahrud.

Peritrechus pusillus, Horváth, *t. c.* p. 12, Syria.

Notochilus (Thaumastopus) cinnamomeus, *id. t. c.* p. 316, Syria.

Tropisthetus [sic] australis, Berg, An. Soc. Arg. xvii. p. 105, Buenos Aires.

Pamera spinicrus and *dubia*, Reuter, Öfv. Fin. Soc. xxv. pp. 17 & 18, Addah.

Diplonotus horvathi and *vicinus*, *id. t. c.* pp. 19 & 20, Addah.

Dinia nitida and *lævicollis*, *id. t. c.* pp. 24 & 25, Addah.

Pœantius gracilicornis, *id. t. c.* p. 26, Addah.

Plinthisus lævigatus, Puton, *t. c.* p. 142, Carthagera.

Gastrodes (Orsillodes) longirostris, *id. t. c.* p. 143, Algeria.

MICROPHYSIDÆ.

Teratophylina, subfam. n., Reuter, Wien. ent. Z. iii. p. 218. "Hæc subfamilia a *Microphysina*, Reut., cui proxima, ♀ oblongo-obovali hemielytris completis prædita structuraque eorum nec non tarsis distincte triarticulatis divergit." Formed for *Teratophylum*, g. n., *ibid.* Type, *T. insigne*, sp. n., *ibid.*, fig., Egypt.

PYRRHOCORIDÆ.

Dermatius apicalis, sp. n., Reuter, Öfv. Fin. Soc. xxv. p. 28, Addah.
Cenæus luridus, sp. n., *id. ibid.*, Ashanti.

TINGITIDÆ.

Gargaphia lunulata, Mayr. Larva described ; Berg, An. Soc. Arg. xvii. p. 108.

Dictyonota (Kalama) putonii, Stål, var. *brevicornis* from Tunis described ; Ferrari, Ann. Mus. Genov. (2) i. p. 474.

Orthostira finitima, sp. n., Puton, Rev. d'Ent. iii. p. 313, Bône, St. Martin Lantosque.

Galeatus cellularis and *semilucidus*, spp. nn., Jakovleff, Rev. mens. Ent. i. p. 121, Turkestan.

ARADIDÆ.

REUTER, O. M. Ad cognitionem Aradidarum palæarcticarum. Wien. ent. Z. iii. pp. 129-137.

A descriptive table of the species known to the writer. A few new species are described, and *Aradus betulæ*, Linn., var. *simulans* from *Ætolia* and the Amoor is noticed. The following synonymy occurs:—*A. corticalis*, Linn. (= *Cimex depressus betulæ*, De Geer), and *A. varius*, Fabr. (= *pictus*, Bärenspr.).

Aradus krueperi, *Ætolia*, p. 130, *brenskæi*, Morea, p. 131, and *hahni*, Breslau, p. 135, spp. nn., Reuter, Wien. ent. Z. iii.

Mezira brevicornis and *orientris*, spp. nn., *id. t. c.* pp. 136 & 137, Vladivostok.

CAPSIDÆ.

REUTER, O. M. *Hemiptera Gymnocerata* Europæ: Hémiptères Gymnocérates d'Europe, du bassin de la Méditerranée et de l'Asie Russe décrites. Tome 3^{me}, pp. 317-568, pls. viii. (Cf. Von Schlechtendal, Z. Naturw. lvii. pp. 625-639.)

Has been issued with the two preceding vols. (the pagination being continuous) as Act. Fenn. xiii. For the two preceding vols., cf. Zool. Rec. xvi. *Ins.* p. 233. The present volume includes *Capsidæ*: *Nasocoraria*, *Cyllocoraria*, and *Dicypharia*, *indices, supplement, and synoptic tables of families, genera, and species to all the three parts of the work. Plates i. and v. represent generic details. The following known species are represented on the others:—*Heterocordylus tenuicornis*, Herr.-Schäff., fig. 9, *genistæ*, Scop., fig. 8, *leptocerus*, Kirschb., fig. 7, *tibialis*, Hahn, fig. 6, *Orthotylus fuscescens*, Kirschb., fig. 5, pl. iv., *Cyrtorhinus pygmeus*, Zett., fig. 4, *geminus*, Flor., fig. 5, *caricis*, Fall., fig. 3, *Mecomma ambulaus*, Flor., figs. 1 & 2, *gileipes*, Stål, fig. 6, *Globiceps sphegiformis*, Rossi, fig. 7, *picteti*, Fieb., fig. 8, pl. ii., *dispar*, Boh., fig. 1, *Cyllocoris marginalis*, Fieb., fig. 2, pl. iii., *Campyloneura virgula*, Herr.-Schäff., pl. ii. fig. 9, *Dicyphus pallidus*, Herr.-Schäff., fig. 3, *errans*, Wolff, fig. 4, *hyalinipennis*, Klug, fig. 5, *pallidicornis*, Fieb., fig. 6, *geniculatus*, Fieb., fig. 8, *globulifer*, Fall., fig. 9, *annulatus*, Wolff, fig. 7, pl. iii., *Cyrtopeltis geniculata*, Fieb., fig. 1, *Macrolophus costalis*, Fieb., fig. 2, *nubilus*, Herr.-Schäff., fig. 3, and *glaucescens*, Fieb., fig. 4, pl. iv.

Distant, Biol. Centr. Am. *Rhynch. Het.* pp. 266-283, notices and generally figures varieties, &c., of *Garganus albidivittis*, Stål, fig. 23, *Calocoris fasciiventris*, Stål, fig. 24, pl. xxv., *opacus*, Stål, pl. xxii. fig. 10, *Capsus scrupus*, Say, and varr. (?) *tetrastigma* and *externus*, Herr.-Schäff., *Lygus pratensis*, Linn. (= *Lygus umbellatarum*, Paetz, *Phyllocoris alpina*, Kol., *Capsus gemellatus*, Herr.-Schäff., *Lygus lineolaris*, *redimitus*, and *diffusus*, Uhl., and *Capsus oblineatus*, Say), figs. 4, 6, 7, & 16, *sallæi*, Stål, figs. 2 & 3, *Pærilocapsus alacer*, Stål, fig. 1, pl. xxiii., *nigriger*, Stål, pl. xxii. figs. 12 & 13, and *ornatus*, Stål (= *Capsus decoratus*, Walk.), pl. xxvii. figs. 1-4, *Falvius anthororoides*, Stål, pl. xxiii. fig. 15, *Henicocnemis albitarsis*, Stål, pl. xxvii. fig. 19, *Eccritolarsus generosus*,

Stål (= *eucosmus*, Stål), pl. xxii. fig. 24, *mundulus*, Stål, fig. 19, and *pallidirostris*, Stål, fig. 14, pl. xxiii; *Calocoris rhæticus*, Mey. (= *Phytocoris lineolatus*, Costa, and *Pucnoperla palmeni*, Reut.), noticed; Reuter, Rev. mens. Ent. i. pp. 133 & 134.

Phytocoris bonaerensis and *Ecritotarsus ruficeps*, Berg, noticed by him; An. Soc. Arg. xvii. pp. 106 & 107.

Teratocoris viridis, Dougl. & Scott (= *hyperboreus*, Sahlb.); Reuter, t. c. p. 133.

Calocoris sp. destructive to young grapes in France described; Patri-geon, C.R. xcviii. pp. 1529 & 1530, and Ent. Nachr. x. p. 182. *C. scarpunctatus*, Fabr.: several varieties, including var. n. *punica* noticed from Tunis; Ferrari, Ann. Mus. Genov. (2) i. p. 476.

Deratocoris trifasciatus, Linn., varr. *regalis* and *bipartitus*, and *olivaceus*, Fabr., varr. *fallax* and *larvatus*, from Hungary, described; Horváth, Term. füzetek, viii. pp. 14 & 317. *D. rapidus*, Say: transformations described; Forbes, Rep. Ins. Illin. xiii. pp. 135-138, pl. xiv. figs. 1 & 2.

Systellonotus albofasciatus, Luc. (?), described from Tunis; Ferrari, t. c. p. 482.

Deratocoris brachialis, Stål, really belongs to this genus, and therefore *Macrocapsus*, Reut., falls; Reuter, t. c. pp. 134 & 135.

Campitobrochis parvulus, Reuter, var. from Madeira described by him; Ent. Tidskr. v. p. 197.

Macrotylus nigricornis, Fieb., varieties from Tunis noticed; Ferrari, t. c. pp. 485 & 486.

Lygus lineolaris, Beauv. (destructive to strawberry): habits, transformations, and ravages described; Forbes, t. c. pp. 115-135, pls. xi.-xiii. *L. lucorum*, Mey. (= *nigrinasutus*, Reut., nec Stål), noticed; Reuter, Rev. mens. Ent. i. p. 134. *L. (Orthops) conspurcatus*, Reut., ♀ described; Ferrari, t. c. p. 478.

Psallus roseus, Reut. (nec Fabr., which = *salicis*, Fieb., Reut., nec Kirschb.), renamed *fallenii*; Reuter, Act. Fenn. xiii. p. 462.

Helopeltis antonii, Sign., said to have been recently imported into Ceylon from Java, and to be destructive to cacao; Distant & H. Trimen, Nature, xxx. p. 634, and xxxi. p. 172. *H. theivora*, Moore [vide Wood-Mason, ante, p. 11].

New genera and species:—

|| *Zopyrus* and || *Zacorus*, Distant, respectively renamed by him *Zoilus* and *Zacynthus*: Biol. Centr. Am., Rhynch. Het. p. 297, note.

Dolichomiris, Reuter, Öfv. Fin. Soc. xxv. p. 29. Allied to *Trigonotylus* and *Megaloceræa*. Type, *D. linearis*, sp. n., t. c., Addah.

Laurinia (Reuter, MS.), Ferrari, Ann. Mus. Genov. (2) i. p. 481. Allied to *Systellonotus* and *Myrmecoris*. Type, *L. fugax* (Reut., MS.), t. c. p. 482, Tunis.

Pappus, Distant, Biol. Centr. Am. Rhynch. Het. p. 266. Allied to *Paracalocoris*. Type, *P. sordidus*, sp. n., t. c. pl. xxv. fig. 22, Guatemala.

Calondas, id. t. c. p. 268. Allied to *Calocoris*. Type, *C. superbus*, pl. xxiii. fig. 22, Mexico, Guatemala, Panama, *fasciatus*, fig. 1, Panama, p. 268, and *testaceus*, fig. 2, pl. xxvi., Costa Rica, p. 269, spp. nn.

- Proba*, Distant, *t. c.* p. 269. Placed after *Megacolum*. Type, *P. gracilis*, sp. n., *t. c.* pls. xxvi. fig. 3, & xxv. 25, Guatemala.
- Proboscidocoris*, Reuter, *t. c.* p. 30. Placed after *Megacolum*. Type, *P. fuliginosus*, sp. n., *t. c.* p. 31, Addah.
- Paraproba*, Distant, *t. c.* p. 270. Allied to *Proba*. Types, *P. fasciata* and *pallescentis*, spp. nn., *t. c.* pl. xxvi. figs. 4 & 5, Guatemala.
- Neoproba*, *id. ibid.* Allied to *Paraproba*. Types, *N. rufescens* and *varians*, spp. nn., *t. c.* pp. 270 & 271, pl. xxvi. figs. 6 & 7, Guatemala.
- Pandama*, *id. t. c.* p. 271. Placed after *Neoproba*. Type, *P. præclara*, sp. n., *t. c.* pl. xxvi. fig. 8, Guatemala.
- Neoborus*, *id. t. c.* p. 276. Allied to *Systratiotus*. Types, *N. saxeus*, Panama, *scaber* and *hirsutus*, Guatemala, spp. nn., *t. c.* pl. xxvii. figs. 5-7.
- Eubatas*, *id. t. c.* p. 277. Allied to *Euarmosus*. Type, *E. chiriquinus*, sp. n., *t. c.* pl. xxvii. fig. 8, Panama.
- Neocapsus*, *id. ibid.* Allied to *Eubatas*. Type, *N. mexicanus*, sp. n., *t. c.* pl. xxii. fig. 19, Mexico.
- Horcias*, *id. ibid.* Allied to *Neocapsus*. To include *H. variegatus*, fig. 13, p. 277, Panama, *notatus*, fig. 14, Guatemala, *thoracicus*, fig. 15, pl. xxvi., *chiriquinus*, Panama, *scutellatus*, Guatemala, Panama, *decoratus*, pl. xxvii. fig. 9, Guatemala, p. 278, *plagiosus*, pl. xxvi. fig. 10, *plumatus*, fig. 10, *rutilus*, fig. 11, *unicolor*, fig. 12, pl. xxvii. p. 279, and *atratus*, Panama, p. 280, spp. nn.
- Calocorisca*, *id. t. c.* p. 280. Placed after *Horcias*. To include *C. villosa*, Guatemala, Panama, fig. 17, *tenera*, Guatemala, fig. 18, pl. xxvi., and *thoracica*, fig. 13, p. 280, Costa Rica, and *antennata*, fig. 14, pl. xxvii., Guatemala, p. 281, spp. nn.
- Cimatlan*, *id. t. c.* p. 281. Allied to *Calocorisca*. Type, *C. delicatum*, sp. n., *t. c.* pl. xxvii. fig. 15, Guatemala.
- Sthenaridea*, Reuter, Ent. Tidskr. v. p. 197. Allied to *Heterocordylus*, but appearance of *Sthenarus*. Type, *S. pusilla*, sp. n., *t. c.* p. 198, Bengal.
- Amixia*, *id. Act. Fenn.* xiii. p. 377. Placed after *Orthotylus*. To include *A. longiceps*, Naxos, and *bicolor* (Fieb., MS.), Parnassus, spp. nn., *t. c.* p. 378.
- Damioscea*, *id. t. c.* p. 443. Allied to *Asciodema*. Type, *Oncotylus komaroffi*, Jak.
- Pseudobryocoris*, Distant, *t. c.* p. 286. Allied to *Eccritotarsus*. Type, *P. bicolor*, sp. n., *t. c.* pl. xxviii. fig. 3, Panama.
- Monalocorisca*, *id. ibid.* Placed after *Pseudobryocoris*. Types, *M. granulata*, Guatemala, and *ravida*, Panama, spp. nn., *t. c.* pl. xxviii. figs. 4 & 5.
- Carnus*, *id. t. c.* [renamed *Carmelus* at p. 297, note] p. 287. Allied to *Monalocorisca*. Types, *C. lunatus*, fig. 6, *formosus*, Panama, and *parvus*, fig. 7, pl. xxviii., Guatemala, p. 287, *funebis*, Panama, p. 288, spp. nn.
- Pseudocarnus*, *id. t. c.* p. 288. Allied to *Carnus* [*Carmelus*]. Types, *P. lineolatus*, Panama, and *magnus*, Guatemala, spp. nn., *t. c.* pl. xxviii. figs. 8 & 9.
- Paracarnus*, *id. t. c.* p. 289. Placed after *Pseudocarnus*. Type, *P. elongatus*, sp. n., *t. c.* pl. xxviii. fig. 25, Panama.

Neocarnus, Distant, *t. c.* p. 289. Allied to *Paracarnus*. Type, *N. vitreus*, sp. n., *t. c.* pl. xxix. fig. 1, Panama.

¶ *Ania*, *id. ibid.* [renamed *Annona* at p. 297, note]. Placed after *Neocarnus*. Types, *A. bimaculata*, pl. xxvii. fig. 25, Guatemala, Panama, and *decoloris* (*Mala decoloris*, pl. xxvi. fig. 23), Panama, spp. nn., *t. c.*

Fundanius, *id. t. c.* p. 290. Placed after *Ania*. To include *F. rubricosus*, *maculatus*, fig. 10, *marginatus*, *pallescens*, fig. 11, and *albomaculatus*, fig. 12, spp. nn., *t. c.* p. 291, pl. xxviii., Guatemala.

Neofurius, *id. t. c.* p. 292. Placed after *Fundanius*. To include *N. villosus*, fig. 13, Panama, *variabilis*, Guatemala, Panama, *auratus*, fig. 14, Guatemala, *amethystus*, fig. 15, Panama, *argentatus*, Guatemala, Panama, *scriptus*, fig. 16, pl. xxviii., Guatemala, *ornandus*, Guatemala, Panama, *pictus* (*Furius pictus* var., pl. xxiii. fig. 24), p. 293, Mexico, Guatemala, *affinis*, Panama, *decoratus*, fig. 17, *infumatus*, fig. 18, *denigratus*, *hieroglyphicus*, fig. 19, p. 294, *pallidulus*, fig. 20, *linearis*, fig. 22, Guatemala, and *plagiosus*, fig. 22, pl. xxviii., Panama, p. 295.

Bibaculus, *id. t. c.* p. 295. Allied to *Neofurius*, and with a superficial resemblance to *Hyaliodes*, Reut., from which it is distinguished by the basal joint of the antennæ not being longer than the head. Type, *B. modestus*, sp. n., *t. c.* p. 296, pl. xxviii. figs. 23 & 24, Guatemala.

Mala, *id. t. c.* p. 296. Placed after *Bibaculus*. Types, *M. unicolor*, Guatemala, and *ornata*, Panama, spp. nn., *t. c.* pl. xxvi. figs. 21 & 22.

¶ *Silia*, *id. ibid.* [renamed *Neosilia* at p. 297]. To include *N. viduata*, fig. 21, *cineracea*, fig. 22, pl. xxvii., Panama, and *sororia*, pl. xxix. fig. 2, Guatemala, spp. nn., *t. c.* p. 297.

Chius, *id. t. c.* p. 297. Allied to *Neosilia*. Type, *C. maculatus*, sp. n., *t. c.* pl. xxvii. fig. 23, Guatemala.

Parachius, *id. t. c.* p. 298. Allied to *Chius*. Type, *P. luteolus*, sp. n., *t. c.* pl. xxviii. fig. 24, Guatemala.

Falconia, *id. ibid.* Placed after *Parachius*. Types, *F. poetica* and *caduca*, spp. nn., *t. c.* pl. xxix. figs. 3 & 4, Guatemala.

Antias, *id. ibid.* Placed after *Falconia*. Types, *A. subaratus*, Guatemala, and *aheneus*, Panama, spp. nn., *t. c.* p. 299, pl. xxix. figs. 5 & 6.

Fuscus, *id. t. c.* p. 299. Placed after *Antias*. Type, *F. crinitus*, sp. n., *t. c.* p. 299, pl. xxix. fig. 7, Guatemala.

Neoleucon, *id. ibid.* Placed after *Fuscus*. Type, *N. horribilis*, sp. n., *t. c.* p. 300, pl. xxvi. fig. 24, Panama.

Spartacus, *id. t. c.* p. 300. Placed after *Neoleucon*. Type, *N. albutus*, sp. n., *t. c.* pl. xxvi. fig. 25, Guatemala.

Trygo, *id. ibid.* Placed after *Spartacus*. Type, *T. imitationis*, sp. n., *t. c.* pl. xxix. fig. 8, Panama.

Jornandes, *id. t. c.* p. 301. Placed after *Trygo*. Type, *J. championi*, sp. n., *t. c.* pl. xxix. fig. 9, Guatemala.

Florus, *id. ibid.* Placed after *Jornandes*. Type, *F. insolitus*, sp. n., *t. c.* pl. xxix. fig. 10, Panama.

Pirithous, *id. t. c.* p. 302. Allied to *Dacota*; antennæ with the first joint constricted at base and longer than head; second joint a little longer than first; fourth a little longer than second. Type, *P. pallipes*, sp. n., *t. c.* pl. xxix. fig. 11, Guatemala.

- led after *Megacelum*. Type, *P. gracilis*, *Eurotas*, Distant, *t. c.* p. 302. Affig. 25, Guatemala.
- sp. n.*, *t. c.* p. 303, pl. xxix. fig. 12, Panama. Placed after *Megacelum*. Type, *Lampethusa*, *id. t. c.* p. 303. Affinities uncertain. Type, *L. anatina*, *sp. n.*, *t. c.* pl. xxix. fig. 13, Guatemala.
- Demarata*, *id. t. c.* p. 303. Affinities uncertain. Type, *D. villosa*, *sp. n.*, *t. c.* p. 303, pl. xxix. fig. 14, Guatemala.
- Lopus bimaculatus*, Jakowlew, *Rev. mens. Ent. i.* p. 122, Ordubat.
- Phytocoris abeillei*, Puton, *Rev. d'Ent. iii.* p. 85, Basses-Alpes.
- Allæonotus caspicus*, Horváth, *Term. füzetek, viii.* p. 316, Transcaucasia.
- Plagiorrhama pilosa*, Reuter, *Öfv. Fin. Soc. xxv.* p. 31, Addah.
- Rest[h]enia flavicosta*, Berg, *Ann. Soc. Arg. xvii.* p. 106, Buenos Aires.
- Paracalocoris molliculus*, *balteatus*, *lunatus*, Guatemala, and *mastrucatus*, Panama, Distant, *Biol. Centr. Am. Rhynch. Het.* p. 265, pl. xxv. figs. 18-21.
- Calocoris tinctus*, fig. 8, *semiopacus*, fig. 9, *nigricans*, fig. 22, pl. xxii, and *C. (?) inustus*, pl. xxiii. fig. 17, *id. t. c.* p. 267, Mexico.
- Megacelum apicale*, Reuter, *t. c.* p. 30, Addah; *M. (?) signatum*, Distant, *t. c.* p. 269, pl. xxiii. fig. 11, Mexico.
- Brachycoleus lineellus*, Jakowlew, *t. c.* p. 122, Ordubat.
- Charagochilus longicornis*, Reuter, *Ent. Tidskr. v.* p. 196, Nicobars.
- Lygus bengalicus* and *obtusius*, *id. t. c.* pp. 195 & 196, Bengal; *L. tactus*, fig. 9, *tribulus*, fig. 10, *championi*, *vinaceus*, fig. 11, pl. xxvi., Guatemala, p. 273, *inspersus*, fig. 8, Mexico, *scutellatus*, figs. 9 & 18, Mexico, Guatemala, and *cristatus*, fig. 10, pl. xxiii., Mexico, Guatemala, Panama, p. 274, Distant, *t. c.*
- Pæcilopsus agrarius*, Guatemala, and *frumentarius*, pl. xxvi. fig. 12, Panama, *id. t. c.* p. 275.
- Halticus minutus*, Reuter, *t. c.* p. 197, Singapore.
- Cyrtorrhinus lividipennis*, *id. t. c.* p. 199, Great Nicobar.
- Campylomma livida*, *id. ibid.*, Bengal.
- Orthotylus cupressi*, Avignou, p. 349, *propinquus*, Spain, p. 356, *alaiensis*, p. 361, *uranicus*, p. 362, *oschanini*, Turkestan, p. 363, and *pusillus*, Tunis, p. 373, *id. Act. Fenn. xiii.*
- Labops (Orthocephalus) phæniceus*, Syria, and *L. (Pachytoma) arenarius*, Hungary, Horváth, *t. c.* p. 14.
- Orthocephalus doriae* (Reut., MS.), Ferrari, *Ann. Mus. Genov. (2) i.* p. 480, Tunis.
- Tuponia brevirostris*, Reuter, *t. c.* p. 440, Hyères.
- Sthenarus syriacus*, *id. t. c.* p. 445, Syria.
- Plagiognathus bipunctatus* (Jak., MS.), Austro-Hungary, Caucasus, p. 451, and *amurensis*, Amur, p. 454, *id. t. c.*
- Criocoris longicornis*, *id. t. c.* p. 455, Hungary.
- Fulvius albomaculatus*, Panama, *fuscans* and *atratus*, Guatemala, Distant, *t. c.* p. 282, pl. xxvii. figs. 16-18.
- Henicocnemis albo-ornata*, *id. t. c.* p. 283, pl. xxvii. fig. 20, Panama.
- Ecrcritarsus nigripes*, Mexico, Guatemala, *genetivus*, pl. xxii. fig. 25, Mexico, *splendens*, fig. 1, Panama, *vestitus*, fig. 2, pl. xxviii., Guatemala, p. 284, *incurvus*, fig. 19, *gibbus*, Guatemala, and *atratus*, fig. 20, pl. xxvi., Panama, p. 285, *id. t. c.*

Neocarnus, Distant, t. c. p. 289.
vitreus, sp. n., t. c. pl. xxix. fig. 1. SCORIDÆ.

Piezostethus ~~bid.~~, [renamed], MS.), Ferrari, Ann. Mus. Genov. (2) i.
 p. 487, Tunis.

PHYMATIDÆ.

Phymata crassipes, Fabr., preying upon *Holopyga gloriosa*, Fabr.;
 Tömösvary, Rov. Lapok, i. pp. 141, 142, & xviii.

SALDIDÆ.

*SAHLBERG, J. Om högnordiska *Salda*-arter och deras utbredningsför-
 hallanden. Förh. vid. 12^{te} Skand. Naturforskäremötet i Stockholm,
 1880, Stockh. 1883, pp. 529-535.

Salda nobilis, sp. n., Horváth, Term. füzetek, viii. p. 317, Hungary.

NABIDÆ.

Allacorrhynchus elegans, sp. n., Reuter, Öfv. Fin. Soc. xxv. p. 32,
 Addah.

Phorticus pulchellus, sp. n., *id. ibid.*, Addah.

Coriscus annulicornis, sp. n., *id. t. c.* p. 33, Addah.

Nabis boreellus, *id.* Ent. Tidskr. v. p. 184, Finland.

REDUVIIDÆ.

Reduvius leucospilus, Stål (= *Harpactor dybowskyi*, Jak.), noticed;
 Reuter, Rev. mens. Ent. i. p. 135.

Hammatocerus reuteri, Berg, and *Daraxa nigripes*, Stål, noticed; Berg,
 An. Soc. Arg. xvii. pp. 108 & 109.

Reduvius (*Diphymus* ?) *loratus*, Stål, discussed; Reuter, Öfv. Fin. Soc.
 xxv. p. 35.

Oncocephalus putoni, Reut., redescribed; Ferrari, Ann. Mus. Genov. (2)
 i. p. 497.

New genera and species:—

Hediocoris, Reuter, Öfv. Fin. Soc. xxv. p. 34. Allied to *Sphedano-*
lestes. Type, *H. fasciatus*, sp. n., *ibid.*, Addah.

Anacanthiocnemis, *id. t. c.* p. 35. Allied to *Strachytropha*, &c. Type,
A. punctumnigrum, sp. n., *t. c.* p. 36, Addah.

Harpactor argenteolineatus, Costa, Bull. Ent. Ital. xv. p. 338, Sardinia.

Thodelmus addahensis, Reuter, Öfv. Fin. Soc. xxv. p. 37, Addah.

Oncocephalus paulinoi, Portugal, and *plumipes*, Algeria, Puton, Rev.
 d'Ent. iii. pp. 144 & 146.

Amphibolus kerimii (Reuter, MS.), Ferrari, Ann. Mus. Genov. (2) i.
 p. 492, Tunis.

Ectrichodia tucumana, Berg, An. Soc. Arg. xvii. p. 109, Tucuman.

Placed after *Megacelum*. Type, *P. gracilis*,
25, Guatemala.

EMESII Placed after *Megacelum*. Type,

Emesodema domestica, Scop., ♀ noticed; Girard, Bull. Soc. Ent. Fr. (6)
iv. p. xxv.

HYDROMETRIDÆ.

Breitenbach discusses pelagic *Hemiptera*, with reference to White's
Report; Kosmos, xiv. pp. 464-467.

Halobates platensis, Berg. Generic characters noticed by him; An. Soc.
Arg. xvii. p. 111.

Æpophilus bonnairei, Sign., noticed from Jersey; Puton, Rev. d'Ent.
iii. pp. 313 & 314.

Gerris lacustris, Linn., attracted by glass; Fletcher, Ent. xvii. p. 21.
G. rufoscutellata, Latr., recorded from Norwich; Edwards, Ent. M. M.
xxi. p. 21.

Lamprotechus, g. n., Reuter, Öfv. Fin. Soc. xxv. p. 40. Subgenus of
Gerris. Type, *G. (L.) leptocerus*, sp. n., *ibid.* [Addah?].

Hydrometra albolineolata, sp. n., Reuter, Öfv. Fin. Soc. xxv. p. 38,
Addah.

Microvelia gracillima, sp. n., *id. ibid.*, Addah.

Rhagovelia reitteri, sp. n., *id. t. c.* p. 39, Addah.

NAUCORIDÆ.

Aphelochira aestivalis, Fabr., noticed; De Kerville & Bellevoye, Bull.
Soc. Ent. Fr. (6) iv. pp. lxxxiii., lxxxiv., xcvi., cxxviii., & cxxix.

BELOSTOMATIDÆ.

Belostoma grande, Linn., noticed and figured; Fyles, Rep. E. Soc.
Ont. 1883, p. 65, fig. 36.

NEPIDÆ.

LUCY, W. A. Anatomy and Physiology of the Family *Nepidæ*. Am.
Nat. xviii. pp. 250-255 & 353-367, pls. ix.-xii.

Nepa cinerea, Linn., burying itself in mud; T. Wood, Ent. M. M.
xxi. p. 20.

NOTONECTIDÆ.

Enithares v-flavum, sp. n., Reuter, Öfv. Fin. Soc. xxv. p. 41, Ashanti.

PLEIDÆ.

Plea granulum, sp. n., Reuter, Öfv. Fin. Soc. xxv. p. 41, Addah.

Neocarnus, Distant, t. c. p. 289.
vitreus, sp. n., t. c. pl. xxix. fig. 1. SIDÆ.

Corisa sexlineata, sp. n., Reuter, Öfv. Fin. Soc. xxv. p. 42, Addah.
Sigara signoreti, sp. n., id. *ibid.*, Addah.

HEMIPTERA-HOMOPTERA.

* MAYR, P. M. Tabellen zum Bestimmen der Familien und Gattungen der Cicadinen von Centraleuropa, nebst Angabe der aus diesem Gebiete bekannten Arten. (Separatabdruck aus dem Programm des k. k. Gymnasiums zu Hall in Tirol für das Schuljahr 1883-84.) Innsbruck: 1884. (Cf. Ent. Nachr. x. p. 23, and Wien. ent. Z. iii. p. 315.)

Includes tables of *Cercopidæ*, *Ulopidæ*, *Paropidæ*, *Scaridæ*, and *Jassidæ*.

List of *Hemiptera-Homoptera* of Galicia; Lomnicki, Sprawozd. Kom. fizyogr. xviii. pp. 230-238.

CICADIDÆ.

Shrill notes of Brazilian species; Jones, Naturalist (2) ix. pp. 129 & 130.

Cicada grossa, Fabr., noticed; Sorensen, Ent. Tidskr. v. pp. 17 & 18.
 Waterhouse, Aid, iii., figures *Tosena splendida* and *albata*, Dist., pl. cxlvii. figs. 1 & 2, and *Platypleura signifera* and *fulviger*, Walk., pl. clii. figs. 5 & 6.

Tibicina luctuosa, sp. n., Costa, Bull. Ent. Ital. xv. p. 339, Sardinia.
Oxypleura truncaticeps, sp. n., Signoret, Bull. Soc. Ent. Fr. (6) iv. p. lvii., Metemma.

Tympanoterpes arechavaletæ, Uruguay, and *cordubensis*, Province of Cordova, spp. nn., Berg, An. Soc. Arg. xvii. pp. 111 & 113.

CERCOPIDÆ.

Tomaspis binotata, *conspicua*, *modesta*, *monteironis*, and *Sphenorhina grandis* and *bogotana*, Distant, figured by Waterhouse, Aid, iii. pls. cxlviii. figs. 1-5, & clii. fig. 2.

Aphrophora spumaria, Linn. Transformations described; Savard, Bull. Insect. Agric. ix. pp. 148-151, figs. 13 & 14.

Philænus xanthaspis, sp. n., Berg, An. Soc. Arg. xvii. p. 115, Buenos Aires.

FULGORIDÆ.

Oliarius signatus, Fieb. (= *obscurus*, Sign.), *Hyalesthes mlokosieweczii*, Sign., *Cicins pilosus*, Oliv. (= *varius*, Fabr.), *distinctus*, Sign., and *desertorum*, Beck (? = *pinicola*, Duf., var.), noticed; Signoret, Bull. Soc. Ent. Fr. (6) iv. pp. lxxviii. & lxxix.

Dictyophora europæa, Linn., and noticed from Tunis; Ferrari, Ann. Μ του των Δέμονων. (*Dactylopius citri*,

Phromnia rubicunda, Distant, Clo. 23. —, and *Phromnia chionæma*, Butler, figured by Waterhouse, Aid. iii. pl. clii. figs. 1, 3, & 4.

Dictyophara suturalis, Germ., redescribed; Berg, An. Soc. Arg. xvii. pp. 114 & 115.

Amphiscepa bivittata. Say, noticed as injurious to cranberry; Riley, Bull. Dep. Agric. Ent. U. S. iv. p. 30.

Flata, Fabr. Curious resemblance of *Cilix spinula*, Linn., to this genus; Distant, P. E. Soc. 1884, p. xx.

New species:—

Oliar[i]us furcatus, p. lxxi., *nigrofurcatus*, Turkestan, p. lxxii., and *putoni*, Sarepta, p. lxxviii., Signoret, Bull. Soc. Ent. Fr. (6) iv.

Hemitropis arcuifera [sic], Puton, Rev. d'Ent. iii. p. 86, Biskra.

Dictyophora xiphias, id. t. c. p. 87, Syria.

Cixius parumpunctatus, Signoret, Bull. Soc. Ent. Fr. (6) iv. p. lxxix., Turkestan.

Trirachus formosissimus, Costa, Bull. Ent. Ital. xv. p. 339, Sardinia.

Conosinus violantis, Ferrari, Ann. Mus. Genov. (2) i. p. 505, figs. 1-3 (details), Tunis.

Hysteropterum doriae, id. t. c. p. 507, Tunis; *H. piceum*, Puton, p. 88, Parnassus; *H. areolatum*, Costa, Bull. Ent. Ital. xv. p. 338, Sardinia.

Dicranotropis carpathica; Horváth, Term. fuzetek, viii. p. 318, Hungary.

IASSIDÆ.

FIEBER, F. X. Description des Cicadines d'Europe du groupe des *Typhlocybini*. Traduit de l'allemand sur le manuscrit original par F. REIBER, avec des additions par L. LETHIERRY. Rev. d'Ent. iii. pp. 40-67, 92-132, & 150-162.

A continuation of the series of articles commenced in R. Z.

Thamnotettix stupidula, Zett., and *Deltocephalus propinquus*, Fieb., recorded as British, and redescribed; Edwards, Ent. M. M. xx. pp. 207 & 208.

Idiocerus distinguendus, Kirschb. (= *cognatus*, Fieb.), recorded as new to Britain, and redescribed; id. op. cit. xxi. pp. 127, 128, & 162.

Typhlocyba sp. noticed as injurious to hop; Riley, Bull. Dep. Agric. Ent. iv. pp. 49 & 50. *T. stellulata*, Burm., noticed, and ♀ redescribed; Signoret, Bull. Soc. Ent. Fr. (6) iv. p. lxxxiv.

Eupteryx melissæ, Curt., and *abrotani*, Dougl., noticed; Douglas, Ent. M. M. xx. p. 215, & xxi. p. 89.

Thamnotettix opaca, Kirschb., var. *minor*, and *abalia*, ♀, Fieb., described from Tunis, and *Athysanus taniaticeps*, Kirschb., structure noticed; Ferrari, Ann. Mus. Genov. (2) i. pp. 514-517.

Orthezia urticae, Linn. Transformation to those of the male, which of pupa; Löw, Wien. ent. Z. iii.

Erythrura ~~aurantia~~ *stjerni*, Kirschb.), Fieber, Rev. d'Ent. iii. p. 46, France, Switzerland.

Notus cephalotes (= *aridellus*, Sahlb.), England, p. 48, *genalis*, S. France, p. 49, *agnatus*, locality unknown, p. 50, and *schmidtii*, Switzerland, Bohemia, Ukraine, p. 54, *id. t. c.*; *N. pulcherrimus*, Horváth, Term. füzetek, viii. p. 320, Tauria.

Chlorita validinervis, p. 56, *aurantiaca*, Lyons, p. 59, *nervosa*, S. France, Spain, p. 60, *prasina*, Sarepta, p. 62, Fieber, *t. c.*

Anomia lepida and *dubia*, *id. t. c.* pp. 129 & 130, Greece.

Typhlocyba semipunctata, Russia, p. 95, *frontalis*, Aarau, p. 111, *binotata*, S. Germany, p. 115, *id. t. c.*

Zygina eburnea, S. France, p. 151, *kru[e]peri*, Greece, p. 157, *rharnii*, Bohemia, p. 158, *id. t. c.*

Empoa albopicta, Forbes, Rep. Ins. Illin. xiii. p. 181, pl. xiv. figs. 3 & 4, Illinois.

Thamnotettix loewii, Horváth, *t. c.* p. 318, Tauria.

Athysanus lauræ and *dubius*, Ferrari, Ann. Mus. Genov. (2) i. pp. 518 & 519 (figs. of tip of abdomen), Tunis; *A. vittulatus*, Berg, An. Soc. Arg. xvii. p. 116, Uruguay.

Phlepsius multifarius, *id. t. c.* p. 117, Uruguay.

Deltocephalus quadrivirgatus, Horváth, *t. c.* p. 319, Hungary.

PSYLLIDÆ.

LÖW, F. Beiträge zur Kenntniss der Jugendstadien der Psylliden. Verh. z.-b. Wien, xxxiv. pp. 143-152.

Includes descriptions of the early stages of *Amblyrrhina cognata*, Löw, *Psylla ulmi*, *Trioza maura*, Först., *scottii* and *remota*, Löw, and a list of species of which the transformations are known.

RILEY, C. V. Notes on North American Psyllidæ. P. Biol. Soc. Wash. ii. pp. 67-79. (Cf. P. Am. Ass. xxxii. p. 319.)

17 species noticed. The following synonymy is given:—*Livia vernalis*, Fitch (= *Diraphia femoralis* and *calamorum*, Fitch), *Psylla pyricola*, Först. (= *pyri*, Harr., and *pyrisuga*, Barn.), *Trioza tripunctata*, Fitch (= *Psylla rubi*, Walsh & Riley).

New genera and species:—

Blastophysa, Riley, P. Biol. Soc. Wash. ii. p. 74. Subgenus of *Pachypsylla*. Type, *P. (B.) c. genma*, sp. n., *ibid.*, United States.

Ceropsylla, *id. t. c.* p. 76. Differs from *Trioza* in neuration. Type, *C. sideroxyli*, sp. n., *id. t. c.*, Florida.

Rhinopsylla, *id. t. c.* p. 77. Probably allied to *Bactericera*. Type, *R. schwarzii*, sp. n., *t. c.* p. 78, Florida.

APHIDID²³. του τῶν Δέμονων. (*Dactylopius citri*,

°BALBIANI, G. Le *Phylloxera* du Chêne ²³ et le *Phylloxera* de la Vigne : Etudes d'Entomologie agricole. Paris: 1884, 4to, pp. 45, 11 pls. (Cf. Bull. Ent. Ital. xvi. p. 301.)

FORBES, S. A. Recent Observations. Plant-Lice—*Aphides*. Rep. Ins. Illin. xiii. pp. 41–54.

Relates to *Chaitophorus flavus*, Forbes [vide *infra*], *Aphis maidis*, Fitch, pls. iii. fig. 5, & iv. figs. 1–3, *Siphonophora* sp., and *Schizoneura pinicola*, Thomas, pl. iv. fig. 4.

°HORVÁTH, G. v. Rapport sur la situation phylloxérique en Hongrie pendant l'année 1883. Budapest: 1884, 8vo, pp. 70, map.

KOLBE, H. J. Beitrag zur Biologie der Aphididen. B. E. Z. xxviii. pp. 343–345.

Relates chiefly to *Lachnus roboris*, Linn., and to the various insects found associated with it. It discharges honeydew spontaneously from the extremity of the abdomen.

LICHTENSTEIN, J. La Flore des Aphidiens, extrait de la Monographie des Aphidiens. Montpellier: 1884, 8vo, pp. viii. & 55. (Cf. Ent. Nachr. x. p. 329, and Bull. Ent. Ital. xvi. p. 304.)

An alphabetical list of genera of plants, with the *Aphides* which attack them, published in advance of a larger work.

— Evolution biologique des Aphidiens du genre *Aphis*, et des genres voisins. C.R. xcix. pp. 1163 & 1164.

He points out the agreement between his own observations and those of Kessler.

— Confirmation of the migration of *Aphides*. Ent. M. M. xx. pp. 178 & 180.

Relates to the observations of Horváth & Lichtenstein on the various states of *Tetraneura ulmi*, Linn., one form of which is *Pemphigus zeamidis*, Löw & Duf. (= *boyeri*, Passerini, and *radicum*, Fonsc.).

— More proofs of Aphidian Migrations. Ent. M. M. xxi. pp. 131 & 132. [Cf. also Bull. Soc. Ent. Fr. (6) iv. p. cxxii.]

Rhizobius menthae and *sonchi*, Pass., are now proved to be underground forms of *Pemphigus pallidus*, Hal., and *bursarius*, Linn.

MACCHIATI, L. Fauna e Flora degli Afidi di Calabria. Bull. Ent. Ital. xv. pp. 254–287.

— A proposito del teoria del J. Lichtenstein del titolo "L'evoluzione biologica degli Afidi in generale e della Filice in particolare." Op. cit. xvi. pp. 259–268.

* TARGIONI-TOZZETTI, A. La Fillossera e le malattie delle viti in Italia dal 1879 al 1883, secondo la relazione della r. stazione di entomologia agraria di Firenze per gli anni stessi. Firenze, Roma: 1883, 8vo, 88 pp.

Orthezia urticæ, Linn. Transformationsgeschichte der Aphiden. Z. wiss. Entom. zu denen von denen der männlichen, welche xlviii.—xxxiv. (Cf. Am. Nat. xviii. of pupa: Löw, Wien. ent. Z. iii.)

The author has selected *Drepanosiphum* (*Aphis*) *platanoides*, Schrank, as a typical species, and describes his materials and method of investigation; the development of the viviparous female in the mother; its postembryonic development; the development of the oviparous ♀ and of the ♂, and that of the viviparous ♀ from the winter egg. The observations of previous authors are noticed throughout; and a short bibliography of publications on the development of insects is appended.

— Der Polymorphismus von *Chaitophorus populi*, Linn. Denk. Ak. Wien, Math.-Nat. Cl. xlviii. pp. 387–394, pls. i. & ii.

The larvæ undergo 5 moults before arriving at maturity. The various forms of males and females differ considerably in the larval as well as in the perfect state. Intermediate forms are of occasional occurrence. Good figures are appended to the paper.

ZACHARIAS, O. Neue Untersuchungen über die Entwicklung der viviparen Aphiden. Zool. Anz. vii. pp. 292–296; translated by Dallas, Ann. N. H. (2) xiv. pp. 54–58.

The pseudovum possesses no chorion, but only a vitelline membrane. In the S-shaped germinal streak, the upper curve turned to the right represents the rudiment of the abdomen, and the intermediate part contains the material for the formation of the head and thorax; the limbs take their origin from a special superficial layer, which is a part of the blastoderm which at a very early period fuses with the true germinal streak. Besides the two vertex plates, a median plate (which is named the mandibular plate, as the mandibles are formed from it) is produced from the ventral part of the cephalic hood. From the rudiments of the mandibles and first maxillæ originate the retort-shaped bodies which are visible on each side of the head in the embryo, thus bringing the parts of the mouth of the *Aphides* into homology with the corresponding organs in other insects. Witlaczil's view, according to which the green cell-mass in the abdomen of the viviparous *Aphides* represents the Malpighian vessels of other insects, is unhesitatingly adopted by the author.

Analysis of Will's observations on the formation of the egg and of the blastoderm in the viviparous *Aphides* (Arb. Inst. Wurzb. vi.; cf. Zool. Rec. xx. Ins. p. 295); Am. Nat. xviii. pp. 168–171, and Biol. Centralbl. iii. pp. 747–750.

Note on *Aphides* in winter; Lichtenstein, Bull. Soc. Ent. Fr. (6) iv. pp. cxxii. & cxxiii.

On destroying *Phylloxera* and other *Aphidæ*; Bull. Ent. Ital. xvi. pp. 143–146 & 308.

Aphis evonymi, Fabr., and *Tetraneura ulmi*, Linn., contributions to life-history; *A. padi*, Linn., note on sexes: Lichtenstein, Bull. Soc. Ent. Fr. (6) iii. pp. cxxxvi.—cxxxviii.

On the migrations of *Aphides*; *id.* Le Nat. vi. pp. 451 & 452.

Effect of storms in destroying *A. d.* Ἰστος τῶν Δέμνονων. (*Dactylopius citri*,
p. 148.

Swarms of *Aphides* in England 1823.

p. 51.

Analytical review of Buckton's British *Aphides*; *Nature*, xxix.
pp. 288-290.

Notes on *Coccidæ* and *Aphidæ*; Cook, *Pract. Ent.* pp. 10-16, figs.
10-12.

Notes on galls of *Tetraneura ulmi*, Linn., *rubra*, Licht., and *Pemphigus pallidus*, Hal.; Lichtenstein, *Bull. Soc. Ent. Fr.* (6) iv. p. lxxi.

Tetraneura ulmi, Linn. Recent observations reviewed: *id.* *Rev. d'Ent.* iii. pp. 7 & 8, and *Bull. Soc. Ent. Fr.* (6) iii. pp. lxxxiii. & lxxxiv. [*cf.* also *Ann. N. H.* (5) xiii. pp. 228 & 229].

Aphis. A New Zealand species and its parasites described; Hudson, *Ent.* xvii. pp. 169-171. A species injurious to strawberry in America; Forbes, *Rep. Ins. Illin.* xiii. pp. 102-104, pl. x. figs. 2 & 3. *A. caryella*, Fitch, noticed; W. Saunders, *Rep. Fruit-Growers' Ass. Ont.* 1882, p. 278. *A. mali*, Fabr. (?), popularly described and figured; *id.* *Rep. E. Soc. Ont.* 1883, p. 23, fig. 3. *A. (Phorodon) humuli*, Schrank: ravages in America, with notice of remedies, &c.; Riley, *Bull. Dep. Agric. Ent. U. S.* iv. pp. 42-49.

Chaitophorus aceris, Linn. Observations completing its life-history; Lichtenstein, *C.R.* xcix. pp. 819-821.

Schizoneura sp. Abstract of Lindeman's observations [*cf.* *Zool. Rec.* xx. *Ins.* p. 295]; *Ent. Nachr.* x. pp. 152-155. *S. corni*, Fabr., destroyed in enormous quantities by spiders; Karsch, *B. E. Z.* xxviii. pp. 181 & 182. *S. lanigera*, Hausm., discussed: Girard, *Bull. Insect. Agric.* ix. pp. 119-121, fig. 11; Kessler, *Kosmos*, xv. pp. 457 & 458; Göthe, **Landwirthschaftliche Jahrbücher*, 1883 (*cf.* *Wien. ent. Z.* iii. pp. 22 & 23).

Phylloxera. Preventive laws noticed; *Gard. Chron.* (2) xxi. pp. 89, 180, 214, 215, 246, & 288, & xxii. p. 18. Ravages in Hungary; Horvath, *Rov. Lapok*, i. pp. 77-82, ix.-xi., 99-102, & xii. & xiii. Apparently unaffected by lightning; Biro, *t. c.* pp. 104 & xiv. Effect of cold; Horvath, *Math. Nat. Ber. Ung.* i. pp. 224-229; *Ent. M. M.* xx. p. 275. On destroying the winter-egg; Balbiani, *Bull. Insect. Agric.* ix. pp. 174-176; *C.R.* xcix. pp. 634-637. Correspondence relating to importation of vines into N. America; Riley, *Bull. Dep. Agric. Ent.* iv. pp. 93-95. Life-history; *Naturhistoriker*, vi. pp. 5-8, pl.; Riley, *P. Am. Ass.* xxxii. p. 320. Observations; Riley & Ragonot, *Bull. Soc. Ent. Fr.* (6) iv. pp. xciv.-xcvi. Unsited to sandy soil; Riley (quoting "The Times"), *Am. Nat.* xviii. p. 78. *P. quercus*, Fonsc., and *corticalis*, Kalt., noticed; Lichtenstein, *Bull. Soc. Ent. Fr.* (6) iv. p. cvii. *P. quercus*: life-history, &c., discussed; Lemoine, *Rev. Sci.* 1884, No. 24 (translated, *Biol. Centralbl.* iv. pp. 550-559. *P. vastatrix*, Planch.: appearance on the Ahr and Rhine; Kraatz, *Deutsche E. Z.* xxviii. pp. 7 & 8; Bertkau, *Verh. Ver. Rheinl.* xli. pp. 96 & 97: report on its appearance in the colony of Victoria; McLachlan & Fitch, *P. E. Soc.* 1883, pp. v. & vi. *P. vitifoliae*, Fitch: remedies discussed; Barnard, *Psyche*, iv. pp. 143 & 144.

Orthezia urticæ, Linn. Transformation to those of the male which indicate increase is checked by Phalanx of pupa; Löw. Wien. ent. Z. iii. 1874 (translated, Rec. Z. Suisse, i. pp. 303-312).

Toxoptera graminum, Rond., destructive to oats in Hungary; Horváth, Rov. Lapok, i. pp. 143-145 & xix.

Chermaphis, g. n., Maskell, N. Z. J. Sci. ii. p. 292. New name for the *Aphididæ* hitherto erroneously referred to *Chermes*. Type, *C. (Anisophleba) pini*, Koch (? = *corticalis*, Kalt.), an allied species to which has lately become very destructive in New Zealand (cf. pp. 291 & 292).

New species:—

Chaitophorus flavus, Forbes, Rep. Ins. Illin. xiii. p. 42, pl. iii. figs. 1-4, Illinois.

Siphonophora minor, id. t. c. p. 101, Illinois.

Aphis cucumeris, id. op. cit. xii. pp. 83-91, figs. 11-14, United States; *A. magnoliæ*, p. 254, *oxalis*, p. 255, and *verbenæ* (? g. n.), p. 258, Macchiati, Bull. Ent. Ital. xv., Calabria.

Myzocallis cyperis, id. t. c. p. 259, Reggio.

Lachnus (?) *bignoniæ*, id. t. c. p. 262, Reggio.

Phylloxera salicis, Lichtenstein, Bull. Soc. Ent. Fr. (6) iv. p. cxxii., C.R. xcix. pp. 616 & 617, Ent. Nachr. x. pp. 362 & 363, Ann. N. H. (5) xiv. p. 439, Montpellier.

COCCIDÆ.

BLANCHARD, R. Les Coccides utiles [cf. Zool. Rec. xx. Ins. p. 297]. Bull. Soc. Z. Fr. viii. pp. 217-328, woodcuts (cf. Wien. ent. Z. iii. p. 62).

Treats of the structure, habits, classification, &c., of the *Coccidæ* in general, and of the species of economic value in particular. The history, chemistry, &c., of the latter are discussed; but the paper apparently contains little original, nor are the woodcuts new. The following species are discussed in greater detail: *Ceroplastes rusci* and *ceriferus*, *Ericerus pe-la*, *Carteria lacca*, *larreæ*, *mexicana*, *Kermes vermileo*, *Gossyparia manniferus*, *Coccus cacti*, *Llaveia axinus*, *Porphyrophora polonica* and *hameli*. A bibliography is added.

GOETHE, R. Beobachtungen über Schildläuse und deren Feinde, angestellt an Obstbäumen und Reben im Rheingau. JB. Nass. Ver. xxxvii. pp. 107-131, pls. i.-iii.

Commences with general remarks, after Signoret [Ann. Soc. Ent. Fr. (4) viii. & ix.]. Then follows an account of the writer's observations on the following known species:—*Diaspis ostryæformis*, Curt., figs. 1-6, *leperii*, Sign., *rosæ*, Sandb., figs. 7-10, *Mytilaspis conchiiformis*, Gmel., *Pulvinaria ribesiae*, Sign., figs. 20 & 21, *vitis*, figs. 22-25, pl. ii. fig. 26, *pyri*, Fitch, figs. 27-29, *Lecanium juglandis*, Bouché, figs. 30-32, *persicæ*, figs. 33 & 34, *pyri*, Schrank, figs. 35-37, *rotundum*, figs. 38-40, pl. ii., and *Dactylopius vitis*, Nied. The paper concludes with a notice of various *Hymenoptera*, *Hemiptera*, and *Coleoptera* (none of them named) which feed upon or are parasitic on *Coccidæ*.

*GENNADIUS, P. *Περὶ τῆς ἐν ἑνδρωθό, φρου τῶν Δέμονων.* (*Dactylopius citri*, Boisd.) Athens: 1884, 8vo, pp. ii. 23.

MASKELL, W. M. Further notes on *Coccinea* New Zealand. Tr. N. Z. Inst. xvi. pp. 120-144, pls. i. & ii.

Amphidionus aurantii, Mask., = *coccineus*, Genn. *Mytilaspis pyri-formis*, Mask., pygidium noticed. *Lecanidæ*: characters discussed and genera tabulated; they are divided into two groups, as follows:—(1) *Lecanidæ*, presenting in all stages a cleft at the abdominal extremity, and above it on the dorsal side two more or less conspicuous and triangular lobes (this includes 3 subsections: *Lecaniodiaspidæ*, *Lecaninæ*, and *Lecanococcidæ*); (2) *Hemicoccidæ*, containing 2 subsections, *Kermetidæ* (*Kermes*) and *Cryptokermetidæ* (*Pollinia* and *Asterolecanium*). *Lecanochiton metrosideri*, M., discussed and figured, figs. 26 & 27. *Ctenochiton perforatus*, M., ♀, antennæ noticed and figured, fig. 28. *Lecanium* sp. on trees noticed. *Eriococcus araucariæ*, M., noticed. *Dactylopius glaucus*, M., ♂ noticed. *Icerya purchasi*, M. (which is quite distinct from *I. sacchari*, Sign.), rapid spread and ravages in New Zealand. *Cælostoma zelandicum*, M., ♂ noticed. The plates chiefly illustrate details, and pl. ii. figs. 22-25, represent the abdomen in the *Diaspidæ*, *Lecanidæ*, and *Coccidæ* (*Eriococcus* and *Dactylopius*).

VOYLE, J. Report on the effects of cold upon the scale insects of the orange in Florida. Bull. Dep. Agric. Ent. iv. pp. 70-75.

Notes on various *Coccidæ* from Lewisham; Douglas & Weir, P. E. Soc. 1884, p. xxx.

Cochineal and lac insects: economic importance, &c., discussed; Bull. Insect. Agric. ix. pp. 33-36, 70, 71, 100-107, & 132-134.

Coccus casti, Linn., and *Acanthococcus tomentosus*, Lam., noticed; Lichtenstein, Bull. Soc. Ent. Fr. (6) iv. pp. cv. & cvi. *C. pini-corticis*, Fitch, noticed; W. Saunders, Rep. Fruit-Growers' Ass. Ont. 1882, p. 273, and Rep. E. Soc. Ont. 1883, p. 56.

Chionaspis pinifolia, Fitch, noticed as injurious to white pine; W. Saunders, Rep. Fruit-Growers' Ass. Ont. 1883, pp. 326 & 327, fig. 26, and Rep. E. Soc. Ont. 1883, pp. 56 & 57. *C. furfurus*, Fitch, combining with *Scolytus rugulosus*, Fitch, to destroy pear-trees; Hagen, Canad. Ent. xvi. pp. 161-163. *C. vaccinii*, Bouché, noticed and figured; Goethe, JB. nass. Ver. xxxvii. p. 116.

Lecanium sp. attacking a broken branch of oak; Mellichamp, Bull. Dep. Agric. Ent. iv. p. 84. *L. asculi*, Koll. (nec Sign.), noticed; Douglas, Ent. M. M. xxi. p. 32. *L. (Pulvinaria) vitis*, Linn.: galls observed in Jersey; Pascoe, P. E. Soc. 1884, p. xix.

Pulvinaria innumerabilis, Ruthv., popularly described and figured; plants injured by it; remedies, &c.: Saunders & Mundt, Canad. Ent. xvi. pp. 141-143, fig. 5, & pp. 210, 211, & 240. Noticed as injurious to strawberry; Forbes, Rep. Ins. Illin. xiii. p. 98, pl. x, fig. 4.

Abstract of Löw's paper on the shield of *Diaspidæ* [cf. Zool. Rec. xx. Ins. p. 297]; Ent. Nachr. x. pp. 25-32.

Mytilaspis pomi-corticis, Riley, noticed and figured; W. Saunders, Rep. Fruit-Growers' Ass. Ont. 1882, p. 270, fig. 4.

Orthezia urticæ, Linn. Transformations described, with special reference to those of the male, which is remarkable as presenting two forms of pupa; Löw, Wien. ent. Z. iii. pp. 11-16.

New species :—

- Chionaspis rosæ*, Goethe, JB. nass. Ver. xxxvii. p. 116, Rheingau.
Lecanium cerasi, figs. 41-43, *variegatum*, figs. 44-46, and *L. vaccinii-macrocarpum*, fig. 47, *id. t. c.* p. 125, pl. ii., Rheingau.
Mytilaspis vitis, *id. t. c.* p. 118, pl. i. figs. 16-18, Rheingau.
Aspidiotus sophoræ, Maskell, Tr. N. Z. Inst. xvi. p. 121, pl. i. fig. 1, New Zealand.
Diaspis santali, *id. t. c.* p. 122, woodcut, New Zealand.
Fiorinia minima, figs. 2 & 3, p. 122, *grossulariæ*, fig. 4, p. 123, and *stricta*, figs. 5-9, p. 124, *id. t. c.* pl. i., New Zealand.
Ctenochiton flavus, figs. 10-21, pl. i. p. 130, *fuscus*, figs. 29 & 30, p. 131, and *depressus*, figs. 31 & 32, pl. ii. p. 132, *id. t. c.*, New Zealand.
Rhizococcus celmisicæ, figs. 33-35, and *fossor*, figs. 36-38, *id. t. c.* pp. 135 & 136, pl. ii., New Zealand.
Dactylopius alpinus, *id. t. c.* p. 138, pl. ii. figs. 39 & 40, New Zealand.
Pseudococcus asteliæ, *id. t. c.* p. 139, pl. ii. figs. 41-44, New Zealand.
Calostoma wairoense, *id. t. c.* p. 141, pl. ii. figs. 45-51, New Zealand.
Orthezia menariensis, Douglas, Tr. E. Soc. 1884, pp. 81-86, pl. ii., Monte Cristo, Italy (several stages described).

ALEURODIDÆ.

Aleurodes immaculata, Heeger, noticed as new to Britain; Douglas, Ent. M. M. xx. p. 215.

(CANOPLURA.)

PEDICULIDÆ.

Hamatopinus, Leach. Notice of Canadian species; Osborn, Canad. Ent. xvi. p. 199.

[It is not fitting that I should finally retire from the staff of the ZOOLOGICAL RECORD without expressing my thanks to my brother-in-law, Mr. A. W. Kappel, now Assistant in the Library of the Linnean Society, for the valuable assistance which he has given me during the time that he has been in London; for the amount of matter which fell to my share after Mr. Rye ceased to contribute to the Entomology was greater than I could have coped with singlehanded.—W. F. K.]

TECHNICAL REPORT

1. The purpose of this report is to provide a detailed account of the work done during the past year in the field of technical research. The work has been carried out under the direction of the Chief Engineer and has been organized into three main sections: (a) General Principles, (b) Experimental Work, and (c) Conclusions.

2. In the first section, the general principles of the subject are discussed. It is shown that the problem is one of great importance and that it has not been fully solved. The work of other investigators is reviewed and it is shown that there is still much to be learned.

3. In the second section, the experimental work is described. The methods used are explained and the results are given. It is shown that the work has been carried out in a systematic and thorough manner and that the results are of high accuracy.

4. In the third section, the conclusions are drawn. It is shown that the work has been successful in many respects and that there is still much to be learned. The work of other investigators is reviewed and it is shown that there is still much to be learned.

5. The work has been carried out in a systematic and thorough manner and the results are of high accuracy. It is shown that the work has been successful in many respects and that there is still much to be learned.

6. The work has been carried out in a systematic and thorough manner and the results are of high accuracy. It is shown that the work has been successful in many respects and that there is still much to be learned.

7. The work has been carried out in a systematic and thorough manner and the results are of high accuracy. It is shown that the work has been successful in many respects and that there is still much to be learned.

8. The work has been carried out in a systematic and thorough manner and the results are of high accuracy. It is shown that the work has been successful in many respects and that there is still much to be learned.

9. The work has been carried out in a systematic and thorough manner and the results are of high accuracy. It is shown that the work has been successful in many respects and that there is still much to be learned.

10. The work has been carried out in a systematic and thorough manner and the results are of high accuracy. It is shown that the work has been successful in many respects and that there is still much to be learned.

ECHINODERMATA.

BY

F. JEFFREY BELL, M.A., SEC. R.M.S.

1. BELL, F. J. Report on the Zoological Collections made in the Indo-Pacific Ocean during the Voyage of H.M.S. 'Alert,' 1881. London: 1884; *Echinodermata*, pp. 117-177 & 509-512, pls. viii.-xvii. & xlv.
2. —. On the Generic Position and Relations of *Echinanthus tumidus*, Woods. P. Z. S. 1884, pp. 40-43, pl. ii.
3. —. Contributions to the Systematic Arrangement of the *Asteroidea*. II. The Species of *Oreaster*. T. c. pp. 57-87.
4. —. Studies in the *Holothuroidea*. III. On *Amphicyclus*, a New Genus of Dendrochirotus Holothurians, and its bearing on the Classification of the Family. T. c. pp. 253-258.
5. —. Studies, &c. IV. On the Structural Characters of the Cotton-Spinner (*Holothuria nigra*), and especially of its Cuvierian Organs. T. c. pp. 372-376. V. Further Notes on the Cotton-Spinner. T. c. pp. 563-565.
6. —. Notes on the Structural Characters of the Spines of *Echinoidea* (*Cidarida*). J. R. Micr. Soc. (2) iv. pp. 846-850, pl. xiii.
7. —. Report on a Collection of *Echinodermata* from Australia. P. Linn. Soc. N. S. W. ix. pp. 496-511. [Full of misprints.]
8. CARPENTER, P. H. Report on the Scientific Results of the Voyage of H.M.S. 'Challenger.' xi. Pt. xxxii. Report on the *Crinoidea*—The Stalked Crinoids. 1884, 4to, pp. 1-440, pls. i.-lxii.
9. —. Notes on Echinoderm Morphology. VII. On the Apical System of the Ophiurids. Q. J. Micr. Sci. xxiv. pp. 1-23, pl. i.
10. —. VIII. On some Points in the Anatomy of Larval *Comatulæ*. T. c. pp. 319-328.
11. —. On the *Crinoidea* of the North Atlantic between Gibraltar and the Faroe Islands. P. R. Soc. Edinb. 1883-4, pp. 353-378.
12. CARPENTER, W. B. On the Nervous System of the *Crinoidea*. P. R. Soc. xxxvii. pp. 67-76.

13. DANIELSSEN, D. C., & KOREN, J. *Asteroiden* in "Den Norske Nordhavs - Expedition 1876-1878," xi. Christiania : 1884, fol., 119 pp., 15 pls., 1 map. [Norwegian and English in parallel columns.]
14. DUNCAN, P. M., & SLADEN, W. P. The Classificatory Position of *Hemiaster elongatus*, D. & S. ; a Reply to a Criticism by Prof. Sven Lovén. Ann. N. H. (5) xiv. pp. 225-242.
15. HOYLE, W. E. A Revised List of British *Ophiuroidea*. P. Phys. Soc. Edinb. viii. pp. 135-155.
16. —. Report on the *Ophiuroidea* of the Færoe Channel, mainly collected by H.M.S. 'Triton,' in August, 1882, with some Remarks on the Distribution of the Order. P. R. Soc. Edinb. xii. pp. 707-730, pl. vii.
17. JICKELI, C. F. Vorläufige Mittheilungen über den Bau der Echinodermen. Zool. Anz. vii. pp. 346-349 & 366-370.
18. —. Ueber einen der Begattung ähnlichen Vorgang bei *Comatula mediterranea*. T. c. pp. 448 & 449 [Ann. N. H. (5) xiv. p. 367].
19. LORIOL, P. DE. Notes pour servir à l'étude des Echinodermes. Rec. Z. Suisse, i. pp. 605-643, pls. xxxi.-xxxv.
20. LOVÉN, S. On *Pourtalesia*, a Genus of Echinoids. Sv. Ak. Handl. xix. No. 7, 95 pp., 21 pls. [Dated 1883.]
21. MARSHALL, A. M. On the Nervous System of *Antedon rosaceus*. Q. J. Micr. Sci. xxiv. pp. 507-548, pl. xxxv.
22. METSCHNIKOFF, E. Embryologische Mittheilungen über Echinodermen. I. Ueber die Bildung der Wanderzellen des Mesoderms bei *Sphaerechinus granularis*. II. Ueber das Nervensystem von *Auricularia* und Ophiuren-larven. Zool. Anz. vii. pp. 43-47. III. Zur Kenntniss der Wassergefässanlage bei Asteriden und Echinodeen, pp. 62-65.
23. MOSELEY, H. N. On the Pharynx of an Unknown Holothurian of the Family *Dendrochirota*, in which the Calcareous Skeleton is remarkably developed. Q. J. Micr. Sci. xxiv. pp. 255-261, pl. xxiii.
24. PERRIER, E. Mémoire sur les Étoiles de Mer recueillies dans la mer des Antilles et le golfe de Mexique durant les expéditions de dragage faites sous la direction de M. Alexandre Agassiz. N. Arch. Mus. (2) vi. pp. 127-276.
25. —. Sur le développement des Comatules. C.R. xliii. pp. 444-446 [Ann. N. H. (5) xiii. p. 310].
- 25a. —. Anatomie des Echinodermes ; sur l'organisation des Comatules. T. c. pp. 1448-1450.
26. SELENKA, E. Das Mesenchym der Echiniden. Zool. Anz. vii. pp. 100-102.

27. SLADEN, W. P. On the Homologies of the Primary Larval Plates in the Test of Brachiata Echinoderms. *Q. J. Micr. Sci.* xxiv. pp. 24-42, pl. i.
28. STUDER, T. Verzeichniss der während der Reise S.M.S. 'Gazelle' um die Erde 1874-76, gesammelten Asteriden und Euryaliden. *Abh. Ak. Berl.* 1884, 64 pp., 5 pls.
29. VIGUIER, —. Constitution des Echinodermes. *C.R.* xviii. p. 1451.

GEOGRAPHICAL DISTRIBUTION.

Echinoderms of the Mediterranean; J. V. Carus, *Prodr. faunæ mediterraneæ* (Stuttgart: 1884, 8vo), pp. 85-111. (Short definitions of all the species.)

For various notes on Echinoderms of Arctic Seas, *cf.* Stuxberg, in Nordenskiöld's *Vega-Expeditionens Vetenskapliga Iakttagelser*, vol. i. (Stockholm: 1882) pp. 677-812.

Echinoderms of the Adriatic; *Stossich, *Bol. Soc. Adr.* viii. 1, pp. 173-192.

Echinoderms of the Scheldt; *Tijdschr. Nederl. Dierk. Ver. Suppl.* 1, ii. pp. 558-569.

Echinoderms of the South Coast of New England; Verrill, *Am. J. Sci.* (3) xxviii. pp. 378-384.

Echinoderms of the Western Indian Ocean; Bell, (1) pp. 509-512.

Echinoderms of Torres Strait and East Australia; *id.* (1) pp. 117-177, and (7).

Asteroids of North Sea; Danielssen & Koren (13).

British Ophiurids; Hoyle (15).

Ophiurids of Færoe Channel, compared with those of North European shores, of Arctic Seas, and of East Coast of North America; *id.* (16).

Crinoids of North Atlantic; Carpenter (11).

GENERAL MORPHOLOGY OF THE GROUP, &c.

Carpenter (9) and Sladen (27) have made interesting contributions to the important question of the homologies of the apical plates of Echinoderms. Sladen directs attention to the more or less marked centrifugal movement of the plates, and points out that there are two sets which are natural—the basi-oral or inter-radial, and the radio-terminal or radial series. These are discussed and compared in the different classes. He is of opinion that the Ophiurids had a Crinoidal ancestor, which was more highly developed than that of the Asterids, and that these two classes have advanced along collateral lines of descent; their terminal plates have, apparently, no homologues in the Crinoids. Carpenter urges objections to the idea that the underbasals represent the dorso-central of the young Echinid, and points out that in *Marsupites*, as well as some Asterids and Ophiurids, there is a dorso-central plate in addition to the underbasals.

The most important contribution to the morphology of the *Echinoidea*

is that of Lovén (20), who has subjected *Pourtalesia* to a searching investigation. The following are some of the results:—

- (1.) Though difficult of detection, the bilateral symmetry of the *Cidaridæ* is to be demonstrated.
- (2.) *Pourtalesia* appears to have suffered a forward movement of the dorsal portion of the body, the result of which is the formation of a rostrum.
- (3.) Two of the interradial unite in the middle line, and so form a continuous broad ring around the middle of the body.
- (4.) The peristome gives indications of the formation of an oral cavity.
- (5.) The sphæridia are absent from ambulacrum No. III., and, as this is raised above the level of the peristome, we have reason for thinking that these organs stand in relation to the testing of food.
- (6.) The structure of the pedicels is discussed in great detail.
- (7.) The morphology of the calycinal system is again discussed, and the lessons to be learnt from *Tiarechinus* pointed out.
- (8.) There are some speculations on the origin of the deep-sea fauna.

W. B. Carpenter (12) gives an interesting account of the morphological and physiological discoveries by which his view of the peculiar disposition of the Crinoid nervous system is shown to be correct. The experiments of Marshall (21) have confirmed and extended his earlier observations, and, with those of Jickeli (17), put on the firm basis of physiological experiment the doctrine that the axial cord is nervous in nature. [See also on this subject, J. R. Micr. Soc. (2) iv. pp. 501 & 502.] Marshall suggests that the morphological difficulty is to be got over by regarding the antambulacral nervous system as being derived from the antambulacral portion of the primitive nerve-sheath which invested the Echinoderm-body. Jickeli thinks that the tentacles are not, as Ludwig supposed, glandular, but that they are sensory in function. Marshall has, further, been able to make some observations on the regeneration of the visceral mass.

Viguier (29) supports the views of Perrier as to Echinoderms being colonies, formed of five reproductive grouped around a nutrient individual; and relies on observations on arms which, after having been broken, had reappeared in a bifurcated form.

On the history of our knowledge of the power of reproduction of Starfishes, see Von Martens, SB. nat. Fr. 1884, p. 25.

On the morphology of the lateral rods of the Ophiurid *Pluteus*, see J. W. Fewkes, Am. Nat. xviii. p. 431.

For a compilation as to our knowledge of the vascular systems, see Essl, Programm des k. k. deut. Staats Gymnasium in Budweis, 1885 (pp. 1-31, 1 pl.), 1884 (pp. 1-15).

The functions and characters of the Cuvierian organs are discussed by Bell (5), who describes various experiments on the threads. For personal observation as to the stickiness of their secretion, see A. Fisher (Nature, xxx. p. 193); a colouring matter not unlike antedonin was found in *H. nigra*; see also Nature, xxx. pp. 146 & 335.

Holothurians do not live on living coral ; Nature, xxx. p. 384.

The first part of P. H. Carpenter's report (8) on the *Crinoidea* collected by the 'Challenger' deals with the general morphology of the group, of which an exhaustive account is given, and describes in detail the stalked forms. It is a complete and elaborate monograph of the subject, and enters fully into the microscopic as well as the macroscopic anatomy of the forms considered ; the relations of recent to extinct forms are carefully pointed out. The classification of the *Pelmatozoa* is discussed historically, and by the light of recent investigations. It is well and fully illustrated. In an appendix various modern problems are discussed, and the work is brought completely up to date. Every student of Echinoderms will make himself acquainted with this report, to which there is appended a full bibliography of the *Neocrinoidea*.

Perrier (25) divides the life-history of *Comatula* into three stages, which he terms the cystidean, the pentacrinoïd, and the comatulid. Some of the statements of Perrier—such as that the plexiform gland of Crinoids (25A) corresponds with the stone-canal of Asterids and Echinids—are criticized by Carpenter (10).

Bell (6) raises doubts as to the correctness of the theory of the determinate growth of Cidarid spines, and shows that the interior grows faster than the enveloping crust.

For a preliminary communication, "Zur Histologie des Asteriden," see O. Hamann, Nachr. Ges. Götting. 1884, pp. 385 & 386.

A bibliographical list of works on Echinoderms of "das nordwest-deutsche Tiefland" is given by S. A. Poppe on p. 27, Abh. Ver. Brem. ix.

ECHINOIDEA.

Bell (1) proposes the name of *Salmacis alexandri* for *S. globator*, Al. Ag. (not L. Ag.).

He has notes on :—

Temnopleurus toreumaticus, *granulosus*, *bothryoides*.

Echinus darnleyensis.

Tripneustes angulosus.

Strongylocentrotus erythrogrammus.

Laganum decagonale.

For notes on *Pseudoboletia*, see Bell, Ann. N. H. (5) xiii. p. 108.

Anomalanthus, g. n., for *Echinanthus tumidus*, Tenison-Woods, on account of the lyre-shaped form of the rows of ambulacral pores ; Bell (2).

On position of *Hemiaster* ; Duncan & Sladen (14).

Galerites albogalerus is edentulous and has no auricles ; P. M. Duncan, Geol. Mag. (3) i. pp. 10-18.

Duncan & Sladen (Pal. Ind. xiv.) continue their account of the fossil *Echinoidea* of Sind ; in the third fasciculus, which is illustrated by 18

plates, they deal with the Khirtchar series, among which various new species were discovered.

De Loriol (19) describes a new Jurassic genus, *Gymnodiadema*, with some resemblances to *Orthocidaris* and *Amblypneustes*, three other Jurassic and five Cretaceous species; *Dictyopleurus haimii*, Duncan & Sladen, has been found in nummulitic rocks near Cairo.

On the tertiary Echinids "des environs du Saint-Palais," see Cotteau, C.R. Ass. Fr. Sci. p. 444, and C.R. xcvi. p. 116.

Micropsis veronensis from the Italian Eocene; A. Bittner, SB. Ak. Wien, lxxxviii. pp. 444-449, 1 pl.

"Sur les calcaires à Échinides de Stramberg (Moravie)"; Cotteau, C.R. xcix. pp. 826-829.

On the distribution of Echinids in the Cretaceous deposits of the department of Seine-Inférieure; E. Bucaille, C.R. xcvi. p. 429.

Cotteau continues his account of Jurassic Echinids, in Pal. Fr. x. pp. 801-848, pls. cccxc. - dii.

Melonites crassus, *irregularis*, *Archæocidaris newberryi*, spp. nn., Ham-bach, Tr. Ac. St. Louis, iv. pp. 548-551.

ASTEROIDEA.

Danielssen & Koren (13) have published a connected and magnificently illustrated account of the species collected by the Norwegian North Sea Expedition, of which preliminary notices have already been published.

Perrier (24), while accepting Viguier's classification of Asterids as "Stellérides ambulacraires" and "S. adambulacraires," reasserts his belief in the value of the pedicellariæ as an aid to classification. He recognizes four orders:—

- I. *Stelleriæ forcipulatæ*, with the families *Brisingiæ*, *Pedicellasteriæ*, and *Asteriæ*.
- II. *S. echinulatæ*, with *Echinasteriæ*, *Solasteriæ*, *Pterasteriæ*, and *Asteriniæ*.
- III. *S. valvulatæ*, with *Linckiæ*, *Gymnasteriæ*, and *Pentagonasteriæ*.
- IV. *S. paxillosoæ*, with *Archasteriæ* and *Astropectiniæ*.

Studer (28) describes as new:—

Asterias fragilis (35° 21' S., 175° 40' W.), *belli* (47° 1' S., 63° 29' W.).

Gymnobrisinga, g. n., for *G. sarsi* (47° 8' S., 64° 51' W.).

Pentagonaster belli (Punta Arenas), *P. squamulosus* (N.W. Australia), *P. (Dorigona) mœbii* (18° 5' S., 116° 38' E.)

Astropecten capensis.

He has notes on:—

Asterias perrieri, *rugispina*, *rupicola*, *antarctica*, *meridionalis*, *studerii*, *harti*, *sulcifera*.

Labidiaster radiosus (a very full account).

Cribrella antillarum.

Acanthaster echinites, *ellisi*.

Linckia miliaris, *pacifica*, *diplax*, *multiforis*, *bouvieri*.

Chataster longipes, nodosus.
Ophidiaster pustulatus, fuscus, cylindricus.
Fromia monilis.
Metrodora subulata.
Pentagonaster meridionalis, tuberculatus.
Culcita novæ-guinæ.
Pentaceros hiuleus, turritus, orientalis.
Cycethra simplex.
Asterina fimbriata, brevis, maculata.
Porania magelhaenica and *P. patagonica* are identical.
Ctenodiscus australis.
Astropecten antarcticus is *A. aurantiacus*; *A. mesactus, A. subinermis.*
 The recently-formed genera *Luidiaster (L. hirsutus)* and *Cheiraster (C. gazellæ* and *C. pedicellaris)* are fully described.

Perrier, (24) describes as new:—
Hymenodiscus (g. n., *Brisingidarum*), for *H. agassizii.*
Korethraster hispidus.
Pentagonaster alexandri, dentatus, affinis, intermedius.
Archaster efflorescens, insignis, coronatus.
 There are also descriptions of new species already recorded, and short diagnoses of new genera [Zool. Rec. xviii. Ech. p. 7].

Verrill, Am. J. Sci. (3) xxviii. pp. 378–384, describes as new:—
Brisinga elegans (606–2021 fath.), *B. costata* (991 fath.).
Archaster robustus (924–1467 fath.), *A. formosus* (1467–2021 fath.).

Bell (1) describes as new:—
Linckia megaloplaæ (p. 126).
Pentagonaster coppingeri, validus (pp. 128 & 129).
Astropecten coppingeri (p. 132).
 From East Australia and Torres Straits.
 He has notes on:—
Asterias calamaria, polyplax.
Echinaster purpureus.
Linckia nodosa, marmorata.
Oreaster gracilis.
Stellaster incei.
Asterina cepheus, brevis (pl. viii.).
Luidia sp.
Astropecten polyacanthus.
Retaster insignis.

Bell (3) has monographed and given descriptions of all the recent species of *Oreaster*. The following are new:—

Oreaster decipiens (Billiton), *productus* (Billiton), *luetkeni* (Billiton), *grayi* (= *Pentaceros nodosus*, Gray), *troscheli* (Billiton), *muelleri* (Billiton).
 Two species incertæ from Mauritius appear to be new.

Goniodiscus articulatus, De Loriol (19).

Oncidaster is a new genus of Jurassic Asterids, (19), most nearly allied to *Oreaster bulbiferus*.

Palæaster magnificus, sp. n. (Lower Silurian), S. A. Miller, J. Cincinn. Soc. vii. p. 16.

OPHIUROIDEA.

Bell (1) describes as new :—

Pectinura megaloplax (p. 134).

Ophiopinax, g. n., for *Pectinura stellata*. Remarkable for the extraordinary development of the plates between the radial shields, both of the same and of the neighbouring sets (p. 135, pl. viii.).

Ophiopeza conjungens (p. 137).

Ophiothrix microplax, *darwini*, *melanogramma* (p. 145).

All from East Australia or Torres Straits.

He has notes on :—

Pectinura geryonia, *infernalis*.

Ophiocoma brevipes.

Ophiarthrum elegans.

Ophiothrix fumaria, *martensi*, *rotata*, *punctolimbata*.

Neoplax, g. n., for *N. ophiodes* (from Darros Island, Amirante Group (*ibid.* p. 511, pl. xlv.)), is a new genus of *Astrophyton*-like Ophiurids, which resembles *Ophiomyces* in the absence of radial shields; it stands nearest to *Ophiomyxa*, from which it is distinguished by the great reduction of the plates at the margin of the disk, the twisted arms, and the absence of the modified spines on the oral processes.

Amphiura bellis var. *tritonis*; Hoyle (16).

Ophioglypha aurantiaca, notes on; *O. signata* figured; the bathymetrical range of various species increased: *id. ibid.*

Ophiochiton grandis (888-1080 fath.), sp. n., Verrill, Am. J. Sci. (3) xxviii. p. 383.

Euryale aspera; Studer, (28) p. 53.

Ophiocreas adhærens, sp. n., *id.* p. 55 (25° 50' S., 112° 36' E.).

Ophiuropsis, g. n., *id.* p. 55. Allied to *Astrocreas*, but without the characteristic processes; for *O. lymanii* (25° 50' S., 112° 36' E.)

HOLOTHUROIDEA.

Bell (4) proposes a re-arrangement of the genera of the Dendrochiro-tous Holothurians, as he believes that the disposition of the ambulacral suckers offers a less certain basis than was supposed; he has three series, (α) stichopod, (β) sporadipod, (γ) armed; and three grades, according as there are ten equal tentacles, eight large and two small, or ten large and ten small (with variations).

Moseley (23) gives a detailed description of the pharynx of an unknown Holothurian from the Sulu Sea, and directs the attention of palæontologists to its characters.

Cucumaria frondosa: spermatogenesis, O. S. Jensen, Arch. Biol. iv. pp. 74-80 & 669-679; structure of testicular tubes, *i. c.* pp. 679-696; ova, *i. c.* pp. 696-701.

Bell (1) describes as new :—

Cucumaria semperi (p. 147, pl. ix.).

Actinocucumis difficilis (p. 148, pl. ix.).

Thyone okeni (p. 149, pl. ix.).

Phyllophorus proteus (p. 150, pl. ix.).

Stereoderma validum (p. 150, pl. ix.).

Holothuria macleari (p. 152, pl. ix.).

All from East Australia or Torres Straits.

He has notes on :—

Synapta grisea.

Cucumaria maculata.

Ocnus sp.

Colochirus tuberculosus, australis.

Thyone mirabilis.

Amphicyclus, g. n., for *A. japonicus*, sp. n., Bell (4). With stichopodous ambulacral suckers and twenty-four tentacles.

On *Holothuria nigra*, see Bell (5).

On *Synapta inhærens*, see L. Petit, Bull. Soc. Philom. (7) viii. p. 51.

Apkyroderma perrieri and *hispanicum*, spp. nn., both from coast of Spain; *id. op. cit.* vii. pp. 162 & 163.

CRINOIDEA.

E. J. Chapman (Tr. R. Soc. Canada, i. Sect. iv. pp. 113-116) proposes a classification of Crinoids based on the presence or absence of a canalculated structure in the calyx and arm-plates.

Carpenter (8) gives exhaustive accounts and descriptions of the species of stalked Crinoids; the forms are discussed in the following order :—

Holopidae.—*Holopus rangi*.

Hyocrinidae, fam. n.—*Hyocrinus bethellianus*, Wyv.-Th.

Bourgueticrinidae.—*Bathycrinus campbellianus*, sp. n., *B. aldrichianus*, Wyv.-Th., *B. gracilis*, Wyv.-Th., *Rhizocrinus lofotensis, rawsoni*.

Pentacrinidae.—*Pentacrinus asterius* (not *asterias*), *muelleri*, *maclearianus*, *wyville-thomsoni*, *alternicirrus*, sp. n., *naresianus*, sp. n., *blakii*, *decorus*, *mollis*, sp. n.

Metacrinus, g. n., for *M. angulatus*, *cingulatus*, *murrayi*, *nobilis*, *varians*, *moseleyi*, *wywillii*, *costatus*, *nodosus*, *interruptus*, *tuberosus*, spp. nn.

The Comatulid *Thaumatocrinus renovatus* is also described.

Bell (1) describes as new :—

Antedon carpenteri (p. 157, pl. x.), *pumila* (ibid. pl. x.), *bidens* (p. 158, pl. xi.), *loveni* (ibid. pl. x.), *decipiens* (p. 159, pl. xi.), *reginæ* (p. 160, pl. xii.), *gyges* (ibid. pl. xii.), *irregularis* (p. 161, pl. xiii.), *elegans* (p. 162, pl. xiii.), *briareus* (p. 163, pl. xiv.), *microdiscus* (ibid. pl. xv.).

Actinometra intermedia (p. 166), *coppingeri* (p. 168, pl. xvi.), *paucicirra* (p. 169, pl. xvii.), *variabilis* (ibid. pl. xvii.).

All from the East coast of Australia or Torres Strait.

There are notes on :—

Antedon aedeonæ, milberti.

Actinometra solaris, robusta, cumingi, and parvicirra.

Pentacrinoid stage of *Antedon rosaceus* ; Herdman, Nature, xxx. p. 634, and Carpenter, xxxi. p. 27.

Adult examples of *Eucrinus gracilis*, and their differences from young ; JB. schles. Ges. lvii. p. 137.

De Loriol continues his account of the Jurassic Crinoids in Pal. Fr. xi. pp. 497-627, pls. cxvi.-cxxi.

Crinoides nouveaux du Devonien de la Sarthe et de Mayenne ; D. Ehlert, Bull. Soc. Géol. (3) x. p. 352.

Hambach has some observations on the structure and classification of Pentremites ; Tr. Ac. St. Louis, iv. pp. 537-548 : and describes some new Blastoids, pp. 551-554.

VERMES.

BY

F. JEFFREY BELL, M.A., SEC. R.M.S.

For a list, with definitions, of the *Vermes* of the Mediterranean, see J. V. CARUS, *Prodromus Faunæ Mediterraneæ* (Stuttgart: 1884, 8vo), pp. 112-282.

For various notes on Worms of Arctic Seas, cf. Stuxberg, in Nordenfjöld's *Vega-Expeditionens Vetenskapliga Iakttagelser*, vol. i. (Stockholm: 1882) pp. 677-812.

For a list of the Worms of the Western part of the Gulf of Finland, see Arch. Nat. Liv. x. pp. 90-95 & 107-109.

For a bibliographical list of works on *Vermes* of "das nordwestdeutsch Tiefland" up to 1883, see S. A. POPPE, *Abh. Ver. Brem.* ix. pp. 28 & 29.

PLATYHELMINTHES.

1. BARTHÉLEMY, A. Sur la physiologie d'une Planaire verte (*Convoluta schultzei*). C.R. xcix. pp. 197-200 [Ann. N. H. (5) xiv. p. 149].
2. BIEHRINGER, J. Beiträge zur Anatomie und Entwicklungsgeschichte der Trematoden. Arb. Inst. Würzb. vii. pp. 1-28, pl. i.
3. BRASS, A. Die thierischen Parasiten des Menschen. Cassel: 1884, 8vo [*Vermes*, pp. 18-85, pls. ii.-v.]
4. BRAUN, M. Zur Entwicklungsgeschichte des breiten Bandwurmes (*Bothriocephalus latus*). Würzburg: 1883, 8vo, 56 pp., 3 pls.
- 4A. —. Die thierischen Parasiten des Menschen. Würzburg: 1883, 8vo. (*Vermes*, pp. 34-205).
5. DUPLESSIS-GOURET, G. Rhabdocèles de la faune profonde du lac Léman. Arch. Z. expér. (2) ii. pp. 36-67, pl. ii.
- 5A. FISCHER, P. M. Ueber den Bau von *Opisthotrema cochleare*, g. & sp. nn. Z. wiss. Zool. xl. pp. 1-41, pl. i.

6. GAFFRON, E. Zum Nervensystem der Trematoden, in Schneider's Zool. Beitr. i. pt. ii. pp. 109-114, pl. xvii. (Abstract in Biol. Centralbl. iv. pp. 425 & 426.)
7. GOETTE, A. Abhandlungen zur Entwicklungsgeschichte der Tiere. 2^{es} Hft. Untersuchungen zur Entwicklungsgeschichte der Würmer. Vergleichender Teil. Hamburg & Leipzig: 1884, 8vo, 215 pp.
8. JIJIMA, J. Ueber den Zusammenhang des Eileiters mit dem Verdauungscanal bei gewissen Polystomeen. Zool. Anz. vii. pp. 635-639.
9. —. Untersuchungen über den Bau und die Entwicklungsgeschichte der Süßwasser-Dendrocoelen (Tricladen). Z. wiss. Zool. xl. pp. 359-464, pls. xx.-xxiii.
10. LANG, A. Die Polycladen (Fauna und Flora des Golfes von Neapel). Leipzig: 1884, 4to, 688 pp., 35 pls.
11. LINSTOW, O. v. Helminthologisches. Arch. f. Nat. l. pp. 125-145, pls. vii.-x.
12. POIRIER, J. Description d'Helminthes nouveaux du *Pelonia frontalis*. Bull. Soc. Philom. vii. pp. 73-80, pl. ii.
13. REPIACHOFF, W. Ueber eine neue an Nebalien lebende Turbellarie. Zool. Anz. vii. p. 717 (preliminary notice).
14. RYDER, J. On a Skin-parasite of the Cunner (*Otenolabrus adspersus*). Bull. U. S. Fish. Comm. iv. pp. 37-42.
15. SCHNEIDER, A. Neue Beiträge zur Kenntniss der Plathelminthen. I. Musculatur der Stammform. II. Entwicklung der Cestoden aus der Stammform. III. Die einzelligen Drüsen und die Stellung von *Peripatus* im System. Schneider's Zool. Beitr. i. 2, pp. 116-125, pls. xviii. & xix.
16. SILLIMAN, W. A. Beobachtungen über die Süßwasser-Turbellarien Nordamerikas. Z. wiss. Zool. xli. pp. 48-78, pls. iii. & iv.
17. ZACHARIAS, O. Ueber einen Monotus des süßsen Wassers. Zool. Anz. vii. pp. 682 & 683.
18. ZSCHOKKE, F. Recherches sur l'organisation et la distribution zoologique des vers parasites des poissons d'eau douce. Arch. biol. v. pp. 153-242, 2 pls.

ANATOMY AND DEVELOPMENT.

The important work of Lang (10) is a complete monograph of the group of Turbellarians of which it treats; the various organs are dealt with in succession, and the historical, no less than the anatomical, view is complete. There is a full history of development, a discussion of the various views as to classification, an account of geographical distribution and habits, and an essay on the phylogenetic relations of Polyclads. The difficulties of accepting the derivation of these worms from the Coelenterates is pointed out; the Triclad is believed to have been

developed from the Polyclads, and the more independent position of the *Nemertinea* is hinted at.

Jijima's (9) studies were chiefly made on *Dendrocoelum lacteum*, *Planaria polychroa*, and *Polycelis tenuis*, sp. n.

Barthélemy (1) believes that the chlorophyll corpuscles of *Convoluta schultzei* are due to a symbiotic *Alga*, and not to the deposition of chlorophyll in the animal, as was thought by Geddes; the latter's observations are criticized.

Gaffron (6) gives a full account of the nervous system of *Distomum isostomum*, and describes six longitudinal trunks, connected by a complicated system of commissures.

The new genus described by Fischer (5A) is remarkable for the characters of its generative organs, and for the fact of their orifice being placed at the hinder end of the body.

Biehinger (2) deals chiefly with the sporocyst-stages; he has examined *Cercaria armata*, *C. macrocerca*, *C. micrura*, *C. acerca*, sp. n. (from *Onchidium carpenteri*), and *Bucephalus polymorphus*. The life history of a Trematode is regarded as an example of alternation of generation.

For an account of the cells "à batonnet" in certain *Cercariæ*, see Sonsino, Arch. Ital. Biol. vi. pp. 57-61.

Perroncito has some observations on the action of chloride of sodium on *Cercariæ*; tom. cit. pp. 154-156.

Demonstration of preparations of the central nervous system of *Cestoda*; Joseph, J.B. sc. Ges. lvi. p. 159.

"Darmlose Strudelwürmer"; J. W. Spengel, Kosmos, xiv. pp. 12-18.

For a general account of the *Nemertinea*, see A. A. W. Hubrecht, Encycl. Brit. ed. ix. vol. xvii. pp. 326-331.

*Leuckart has an article on "Bandwürmer" in Koch's Encycl. d. Thierheilk. i. pp. 361-404.

GENERA AND SPECIES.

The following is Lang's system of the Polyclades (10):—

A. Tribus Acotylea.

1. Fam. *Planocera*dæ; with *Planocera*, *Imogene*, *Conoceros*, *Stylochus*, *Stylochoplana*, *Diplonchus*.
2. Fam. *Leptoplanidæ*; with *Discocelis*, *Cryptocelis*, *Leptoplana*, *Trigonoporus*.
3. Fam. *Cestoplanidæ* (fam. n.), for *Cestoplana*.

B. Tribus Cotylea.

4. Fam. *Anonymidæ* (fam. n.), for *Anonymus*.
5. Fam. *Pseudoceridæ*; with *Thysanozoon*, *Pseudoceros*, *Yungia*.
6. Fam. *Euryleptidæ*; *Prostheceræus*, *Cycloporus*, *Eurylepta*, *Oligocladus*, *Stylostomum*, *Aceros*.
7. Fam. *Prosthiostomidæ* (fam. n.), for *Prosthiostomum*.

Lang describes as new:—

Planocera villosa, *papillosa*, *insignis*.

Conoceros (= *Imogene*, Schm., e. p.), for *I. conocera*.

Stylochus plessisii.

Stylochoplanea agilis.

Cryptocelis, for *Leptoplanea alba* and *C. compacta*.

Leptoplanea vitrea, *moseleyi*.

Trigonoporus, for *T. cephalophthalmus*.

Cestoplanea, for *Orthostomum rubrotinctum* and *C. faraglionensis*.

Anonymus, for *A. virilis*.

Pseudoceros, for *Proceros velutinus*, *Pseudoceros superbus* and *maximus*.

Yungia, for *Planaria aurantiaca*.

Prosthecereus albocinctus, *giesbrechtii*, *pseudolimax*, *moseleyi*, *rubropunctatus*, *roseus*.

Cycloporus, for *C. papillosus* (= *Proceros tuberculatus*).

Eurylepta lobianchii.

Oligocladus, for *Proceros sanguinolentus*.

Stylostomum, for *S. variabile*.

Aceros, for *A. inconspicuus*.

Prothiostomum dohrnii.

Duplessis-Gouret (5) gives an account of :—

Macrostoma hystrix.

Microstoma lineare.

Prochynchus stagnalis.

Gyrator hermaphroditus (= *G. cæcus*, Graff).

Otomesostoma morgiense.

Mesostoma productum, *lingua*, *rostratum*, *trunculum*.

Typhoplanea viridata.

Vortex intermedius, sp. n.

Plagiostoma lemani (= *Planaria lemani* of Graff).

Silliman (16) describes as new :—

Macrostoma sensitivum.

Stenostoma agile.

Mesostoma gonocephalum, *cæcum*, *pattersoni*, *viviparum*.

Gyrator (?) *albus*.

Vortex pinguis, *blodgetti*.

Plagiostoma (?) *planum*.

Tetrastemma aquarum-dulcium.

And has notes on :—

Macrostoma hystrix.

Microstoma lineare, *caudatum*.

Stenostoma leucops.

Prochynchus fluviatilis.

Vortex armiger.

Zschokke (18) describes or has notes on :—

Tænia ocellata, Rud., *T. longicollis*, Rud., *T. filicollis*, Rud., *T. salmonis-umbæ*, sp. n., *T. torulosa*, Rud.

Bothriocephalus infundibuliformis, Rud., is united with *B. proboscideus*, Rud.

Dibothrium ligula, Donnadieu.

Trienophorus nodulosus, Rud.

Tetrarhynchus lotæ.

Cyathocephalus truncatus, Pallas.

Caryophyllæus mutabilis, Rud.

Homalogaster, g. n. (*Amphistomidæ*) for *H. peloniæ*, and

Gastrothylax, g. n., for *G. elongatum* and *cobboldii*; Poirier (12).

Zschokke (18) describes or has notes on :—

Distoma nodulosum, Zeder, *D. globiporum*, Rud., *D. tereticolle*, Rud.,
D. rosaceum, v. Nordmann, *D. longicolle*, Creplin, *D. folium*, Olfers.

Monostoma du Cottus (? *M. marcenula*, Rud.).

Tetracotyle perca-fluviatilis, Moulinié.

Diplozoon paradoxum, Nordmann (?).

Diplostomum volvens, Nordmann.

Sporocystis cotti, sp. n.

Trematode parasitic in American Crayfish; R. Ramsay Wright, Am. Nat. xviii. p. 429.

Stichocotyle nephropis, sp. n., J. T. Cunningham, Zool. Anz. vii. p. 399.

On *Distomum echinatum*, Zed. (= *D. oxycephalum*, Rud.), *D. heteroporum*, *D. ascidia*, *D. globiporum*, see Linstow (11).

Distomum gyrini, sp. n. (Tadpoles of *Rana temporaria*); id.

Distoma oricola from mouth of *Alligator mississippiensis*; Leidy, P. Ac. Philad. 1884, p. 47.

Opisthotrema cochleare, g. & sp. nn., from tympanic cavity of *Halicore dugong*; Fischer (5A).

On *Cercaria limnææ-ovata*, *C. nodulosa* (*Paludina impura*), spp. nn.;

Tænia brevis, sp. n. (*Charadrius pluvialis*);

Tænia tenuicollis, Rud.; see Linstow (11).

Tænia apterycis; Chatin, Mém. Soc. Biol. (8) i. p. 770.

Bothriocephalus latus; Braun, SB. Ges. Dorp. vi. pp. 528-534.

Bothriocephalus in the Pike; id. op. cit. vii. pp. 45 & 46.

Ligula mansoni; Manson, (28) pp. 157-161, and Am. Nat. xviii. p. 199.

Rare human Tapeworm; Leidy, P. Ac. Philad. 1884, p. 137.

**Cysticercus* in human eye; Jany (cf. Zool. Anz. vii. p. 419).

M. Flesch (Rec. Z. Suisse, i. pp. 477-479) gives a list of the vermian entozoic parasites of the Horse.

Örley & Bell on Parasites of Indian Fishes; Ann. N. H. (5) xiii. p. 173.

NEMATHELMINTHES.

19. AURIVILLIUS, C. W. S. Eine Anguillulide aus der Schneefauna Spitzbergens. Sv. Ak. Handl. viii. No. 11, 15 pp., 1 pl.

20. BENEDEN, E. VAN, & JULIN, C. La spermatogénèse chez l'Ascaride mégalocephale. Bull. Ac. Belg. liii. pp. 312-342.

21. CHATIN, J. Nouvelles observations sur l'anguillule de l'oignon. C.R. xcvi. pp. 375-377 [Bull. Soc. Philom. (7) viii. p. 57].

22. DE MAN, J. G. Die frei in der reinen Erde und im süßen Wasser lebenden Nematoden der Niederländischen Fauna. Leiden: 1884, 4to, 206 pp., 34 pls. [See Biol. Centralbl. iv. p. 191.]
23. FOURMENT, L. Note sur un Nématode nouveau parasite du Merlan. Ann. Sci. Nat. (6) No. 4, 8 pp., 1 pl.
24. GIRARD, A. Sur le développement, en France, des Nématodes de la Betterave pendant la campagne de 1884. C.R. xcix. pp. 925-928.
25. HALLEZ, P. Sur la Spermatogenèse et sur les phénomènes de la fécondation chez les *Ascaris megalocephala*. C.R. xviii. pp. 695-697 [Bull. Sci. Nord, vi. pp. 132-137].
26. JOSEPH, G. Beiträge zur Kenntniss der Nervensystems der Nematoden. Zool. Anz. vii. pp. 264-266.
27. MANSON, P. The Metamorphosis of *Filaria sanguinis-hominis* in the Mosquito. Tr. L. S. (2) ii. pp. 367-388, pl. xxxix.
28. —. The *Filaria sanguinis-hominis* and certain New Forms of Parasitic Disease in India, China, and Warm Countries. London: 1883, 8vo, viii. & 186 pp., 10 pls.
29. MÉGNIN, P. Mémoire sur un nouvel Helminthe, le *Sclerostoma bouharti*. J. de l'Anat. Phys. xx. pp. 455-462, pl. xxx.
30. MONVENOUX, F. Documents relatifs à la présence des matières grasses dans l'urine (1^{ère} ser.), suivis d'une nomenclature raisonnée des travaux qui ont paru jusqu'à ce jour sur les Entozoaires, la chylurie et de la hématochylurie. Lyons: 1884, 4to, 1184 pp., 11 pls.
31. PENNETIER, G. Nouvelles expériences sur la résistance vitale des Anguillules de la nielle. C.R. Ass. Fr. Sci. xii. pp. 572-575.
32. VILLOT, A. Sur le Parasitisme et la Détermination spécifique des Larves des Gordiens. Zool. Anz. vii. pp. 84-88.

A short general account of *Nematoidea* is given by F. E. Beddard, in Encycl. Brit. ed. ix. vol. xvii. pp. 324-326.

Bunge's experiments on *Ascaris mystax*, to test the amount of oxygen required by intestinal parasites, are reported on in Biol. Centralbl. iv. p. 31.

E. van Beneden (Arch. biol. iv. pp. 265-640, pls. x.-xix.) takes *Ascaris megalocephala* as the basis for a study of the general history of the ovum.

On the fecundation of *Ascaris*, see Schneider, Zool. Beitr. i. 2, p. 131.

Eggs of *Bilharzia*; Chatin, Mém. Soc. Biol. (8) i. p. 364; they have a thick test.

Sonsino on *Filaria sanguinis-hominis* is noticed in Arch. Ital. Biol. vi. p. 110.

Anguillula stercoralis is the free form of *A. intestinalis*; Golgi & Monti, op. cit. v. p. 395. Its relations to Cochin China diarrhœa; SB. Ges. Würzb. 1883, pp. 22-35.

Ankylostoma duodenale in Belgium ; Bull. Ac. Belg. liii. p. 654.

On the Nematoids found in the lungs of Sheep, see Koch, Rev. f. Thierheilk. vi. pp. 17, 33, 63, & 97, pls. ii.-vi.

Pathological effects of *Sclerostoma armatum* ; Mégnin, Mém. Soc. Biol. (8) i. p. 622.

Nematoid parasite of *Sula bassana* ; Fourment, t. c. p. 649.

Experiments with American trichinized meat ; *id.* t. c. p. 67.

GENERA AND SPECIES.

Zschokke (18) describes or has notes on :—

Ascaris acus, Bloch, and its larva, *A. tenuissima*, Rud., *A. adiposa*, Schrank., *A. capsularia*, Rud., *A. truncatula*, Rud.

Disphragus denudatus, Duj., *D. filiformis* (spec. nos.) (*Ascaris cuneiformis*, Rud.).

Cucullanus elegans, Zeder.

Gordius aquaticus, Gmel. (?).

Ascaris apterycis, sp. n., Chatin, Mém. Soc. Biol. (8) i. p. 770.

Linstow (11) describes as new :—

Ascaris aculeati (= *Agamonema bicolor*, Diesing, e.p., and *A. papilligerum*, D., e.p.) (liver of *Gasterosteus aculeatus*).

Heterakis borealis (*Lagopus mutus*).

Oxyuris stroma (*Mus sylvaticus*).

Agamonemutodum gasterostei (intestine of *G. aculeatus*), *A. vespillonis* (*Necrophorus vespilli*).

And has notes on :—

Ascaris ensicaudata, *A. capsularia*, *A. spiralis*, *A. adunca*.

Heterakis inflexa.

Strongylus paradoxus.

Spiroptera vanelli, *S. turdi* (= *Filaria turdi*).

Oxyuris obvelata.

Trichosoma contortum.

Gordius aquaticus.

Of the species described in De Man's monograph (22), the following have not before been recorded :—

Monohystera paludicola, *microphthalma*, *macrura*, *vulgaris*, *simplex*, *agilis*, *bulbifera*.

Tripyla filicaudata, *affinis*, *monohystera*, *arenicola*.

Microloaimus, for *M. globiceps*.

Cyatholaimus intermedius, *terricola*, *ruricola*.

Mononchus parvus.

Ironus longicaudatus.

Dorylaimus superbus.

Spinitectus oviflagellis, g. & sp. nm. (Filarid), Fourment (23).

Aphelenchus nivalis, sp. n., Aurivillius (19).

Larvæ of *Mermis* ; Kiehm, Z. ges. Naturw. lvii. p. 675.

Mermis nigrescens ; R. T. Lewis, J. Quek. Club, 1884, pp. 24-26.

1884. [VOL. XXI.]

ACANTHOCEPHALI.

33. SÆFFTIGEN, A. Zur Organisation der Echinorhynchen. Morph. JB. x. pp. 120-171, pls. iii.-v.

On the encystment of *Echinorhynchus polymorphus*; see Fourment, Bull. Soc. Philom. (7) vii. pp. 53-55.

Sæfftigen (33) finds that the true muscular tissue forms the chief material from which most of the organs are built up; it presents various points of resemblance to that of the Nematoid worms; the nervous system is described in detail.

Echinorhynchus eperlani; see Linstow, (11) p. 138.

Zschokke (18) describes or has notes on:—

Echinorhynchus proteus, Westmenb., *E. angustatus*, Rud., *E. claviceps*, Zeder(?).

ROTATORIA.

34. FULKE, S. G. On a new species of Rotifer of the genus *Apsilus*. P. Ac. Philad. 1884, pp. 37-41, pl. i.
35. HUDSON, C. T. An Attempt to Reclassify the Rotifers. Q. J. Micr. Sci. xxiv. pp. 335-356.
36. PLATE, L. Zur Kenntniss der Rotatorien. Zool. Anz. vii. pp. 573-576.
37. ROSSITER, T. B. Observations on the Life-History of *Stephanoceros eichhornii*. J. R. Micr. Soc. (2) iv. pp. 169-172.
38. ZACHARIAS, O. Ueber Fortpflanzung und Entwicklung von *Rotifer vulgaris*. Z. wiss. Zool. xli. pp. 226-251, pl. xvi.

Hudson (35) proposes to classify the Rotifers thus:—

Order 1. RHIZOTA.	Fam. 1. <i>Flosculariadae</i> .
	„ 2. <i>Meliceradae</i> .
„ 2. BDELOIDA.	„ 3. <i>Philodinadae</i> .
„ 3. PLOIMA.	* Il-loricated.
	„ 4. <i>Hydatinadae</i> .
	„ 5. <i>Synchaetadae</i> .
	„ 6. <i>Notommadae</i> .
	„ 7. <i>Triarthradae</i> .
	„ 8. <i>Asplanchnadae</i> .
	** Loricated.
	„ 9. <i>Brachionidae</i> .
	„ 10. <i>Pterodinadae</i> .
	„ 11. <i>Euchlanidae</i> .
„ 4. SCIRTOPODA.	„ 12. <i>Pedalionidae</i> .

The names of the principal genera are appended.

E. von Daday [Math. Nat. Ber. Ung. i. pp. 261-264; Ann. N. H. (5) xiii. p. 309] describes as new:—

Brachizus margoi.

Schizocerca, for *S. diversicornis*.

Asplanchna triophthalmus.

S. G. Foulke (34) forms a new family of *Apsilidae* for Rotifers in which the ordinary rotatory organ is replaced by a membranous cup or net, not ciliated externally. *Apsilus bipera*, sp. n. (But see Leidy, *op. cit.* p. 50.)

Notes on some free-swimming Rotifers; J. E. Lord, North. Micr. iv. pp. 72-75, 145-148, 177-180, & 233-236.

GEPHYREA.

39. RIETSCH, M. Sur la structure histologique de la trompe de la Bonellie. Bull. Soc. Philom. (7) viii. pp. 125-132.

40. SLUITER, C. P. Beiträge zu der Kenntniss der Gephyreen aus dem Malayischen Archipel. Tijdschr. Nederl. Ind. (8) iv. pp. 26-88, 3 pls.

Life-history of *Thalassema*; H. W. Conn, J. Hopk. Univ. Circ. iii. p. 127 (*Studies Biol. Lab. iii. No. 1, pp. 29-37, pl. iii.).

41. Phascolosoma on the "Banc de Thornton"; Bull. Ac. Belg. liii. p. 646. Levinsen (54) makes the new family *Saccosomatidae*. Among the *Sipunculidae* there are *Phallosoma*, g. n., for *P. norvegicum* and *P. priapuloides*.

Sluiter (40) describes in detail *Echinosophon*, g. n., for *Loxosophon aspergillum*, *Aspidosophon gigas*, sp. n., and *Thalassema erythrogrammon*.

ANNULATA.

41. BERGH, R. S. Ueber die Metamorphose von *Nephelis*. Z. wiss. Zool. xli. pp. 284-301, pls. xviii. & xix.

42. —. Thatsachen aus der Entwicklungsgeschichte der Blutegel. Zool. Anz. vii. pp. 90-94.

43. BOURNE, A. G. Contributions to the Anatomy of the *Hirudinea*. Q. J. Micr. Sci. xxiv. pp. 419-508, pls. xxiv.-xxv.

44. CONN, H. W. Development of *Serpula*. Zool. Anz. vii. pp. 669-672.

45. FISCHER, W. Anatomisch-histologische Untersuchungen von *Capitella capitata*. Marburg: 1884, 28 pp., 2 pls.

46. FOETTINGER, A. Recherches sur l'organisation de *Histiobdella homari*, P. J. van Beneden rapportée aux Archiannelides. Arch. biol. v. pp. 433-516, pls. xxv.-xxix.

47. FRAIPONT, J. Le rein céphalique du *Polygordius*. Arch. biol. v. pp. 103-110, pl. vi. [Bull. Ac. Belg. (3) liii. p. 94].

48. [FRAIPONT, J.] Recherches sur le système nerveux central et périphérique des Archiannélides (*Protodrilus* et *Polygordius*) et du *Saccocirrus papilocercus*. T. c. pp. 234-304, pls. xi.-xv. (t. c. p. 99).
49. HASWELL, W. A. The Marine Annelides of the Order *Serpulea*. Some observations on their Anatomy, with the characteristics of the Australian species. P. Linn. Soc. N. S. W. ix. pp. 649-675, pls. xxxi.-xxxv.
50. JOURDAN, E. Sur la structure des otocystes de l'*Arenicola grubii*, Clap. C.R. xcvi. pp. 757 & 758 [Ann. N. H. (5) xiii. p. 488].
51. —. Le cerveau de l'*Eunice harassii*, et ses rapports avec l'hypoderme. T. c. pp. 1292-1294 (t. c. p. 488).
52. LANGERHANS, P. Die Wurmfauna von Madeira. IV. Z. wiss. Zool. xl. pp. 247-285, pls. xv.-xvii.
53. LEMOINE, —. Recherches sur le développement et l'organisation de l'*Enchytræus albidus* (Henle), *E. buchholzii* (Vejdovsky). C.R. Ass. Fr. Sci. xii. pp. 531-539.
54. LEVINSSEN, G. M. R. Systematisk geografisk Oversigt over de Nordiske *Ammulata*, *Gephyrea*, *Chatognathi*, og *Balanoglossi*; II. Vid. Medd. 1883 (1884), pp. 92-350, pls. i.-iii.
55. MARENZELLER, E. Zur Kenntniss der adriatischen Anneliden. III [Terebellen.] SB. Ak. Wien, lxxxix. 64 pp., 2 pls.
56. —. Südjapanische Anneliden. II. *Ampharetea*, *Terebellacea*, *Sabellacea*, *Serpulacea*. Denk. Ak. Wien, xlix. Abth. ii. 28 pp., 4 pls.
57. NUSBAUM, J. Zur Entwicklungsgeschichte der Hirudineen. Zool. Anz. vii. pp. 609-615.
58. ORLEY, L. Die Kiemen der Serpulaceen und ihre morphologische Bedeutung. MT. z. Stat. Neap. v. pp. 197-228, pls. xii. & xiii.
59. —. Ueber die Athmung der Serpulaceen in Allgemeinen, mit besonderer Rücksicht auf den Werth ihrer Haut-pigmente. Term. füzetek, viii. pp. 199-207.
60. POIRIER, —, & DE ROCHEBRUNE, A. T. Sur un type nouveau de la classe des Hirudinées. C.R. xcvi. p. 1597 [Ann. N. H. (5) xiv. p. 149].
61. PRUVOT, G. Sur le système nerveux des Euniciens. C.R. xcvi. pp. 1494 & 1495.
62. SAINT-LOUP, R. Sur la fonction pigmentaire des Hirudinées. C.R. xcvi. pp. 441-444.
63. VEJDovsky, F. Revisio Oligochætarum Bohemiæ. 3^{ed}. böhm. Ges. 1883 (1884), pp. 215-228.
64. VIGUIER, C. Études sur les animaux inférieurs de la baie d'Alger. Arch. Z. expér. (2) ii. pp. 69-119, pls. iii.-v.
65. VOIGT, W. Untersuchungen über die Varietätenbildung bei *Branchiodella varians*. Arb. Inst. Würzb. vii. pp. 41-94, pls. ii.-iv.

66. WEBSTER, H. E., & BENEDICT, J. E. The *Annelida Chætopoda* from Provincetown and Wellfleet, Mass. U. S. Comm. Fish., Report of Commr. for 1881 (1884), pp. 699-747, 8 pls.
67. WHITMAN, C. O. The External Morphology of the Leech. P. Am. Ac. xx. pp. 76-86, 1 pl. [See also Am. Nat. xviii. p. 1104.]
- 67A. WIREN, A. Chætopoder från Sibiriska Ishafvet och Berings Haf insamlade under Vega-Expeditionen 1878-79. In Vol. ii. Vega-Expeditionens Vetenskapliga Iakttagelser, pp. 383-428, pls. xxvii.-xxxii. (Stockholm: 1883).

Annelids of the Scheldt; Tijdschr. Nederl. Dierk. Ver. Suppl. i. 2, pp. 550-557.

ANATOMY AND DEVELOPMENT.

Polygordius has been investigated by Fraipont (47 & 48), who finds that the two halves of the ventral nerve-cord are closely united, as in higher Annelids, but that, like that of *Protodrilus*, it retains its embryonic position; the cerebral ganglia are more concentrated and isolated than in *Saccocirrus*. The head-kidney has been accurately described by Hatschek; Fraipont thinks that the excretory infundibula of the larva have no close or real resemblance to those of Rotifers, Trematodes, or Cestodes; there is an instructive resemblance between *Echiurus* and *Polygordius*.

Foettig (46) describes in detail the structure of *Histriobdella homari*, which he removes from the Leeches, and calls *Histriodrilus benedeni*; he modifies Hatschek's classification, regarding the *Hirudinea* as Platyhelminths, and proposes the following modified scheme:—

Annélides	{	1 Ordre—	{ Polygordides.
		Archiannélides.	{ Histriodrilides.
	{	2 Ordre—	{ Saccocirrides (Archichætopodes).
		Chætopodes . .	{ Polychètes. Oligochètes.

The investigations of Örley (58) into the minute structure of the gills of Serpulids point to the opercular plate, which is a modification of some of the gill-threads, having a respiratory function; it is richly supplied with capillaries. There is no reason for suspecting either homology or analogy with the gills of vertebrates. The colours (59) of these worms have no sexual significance or defensive value, and it is probable that they have some relation to respiratory processes.

Pruvot (61) describes in *Hyalinacia tubicola* a "ventricle" which communicates with the body cavity. Jourdan (51) insists on the intimate relation between nerve-cells and fibres, and the hypodermic epithelial cells.

The otocysts of *Arenicola grubii* are described by Jourdan (50).

Vignier (64) discusses the characters and developmental history of *Exogone gemmifera*, *Spharosyllis pirifera*, *Syllides pulliger*, and *Grubea mbata*.

A new Pelagic larva; J. W. Fewkes, Am. Nat. xviii. p. 300.

Trochosphere larva of *Serpula*; H. W. Conn, J. Hopk. Univ. Circ. iii. pp. 15 & 16.

*Drasche on development of *Pomatoceros*; Zool. Anz. vii. p. 434.

Beddard describes the structure of the body-wall in *Perionyx* and *Perichæta*, and directs attention to the high development of the elastic network which underlies the epidermis; P. Phys. Soc. Edinb. 1883-4, pp. 89-91.

Bergh (41) describes the provisional body-wall of *Nepheleis* as being cast off during development; nearly the whole of the body of the adult is formed from the fused head- and trunk-germs.

The elaborate and beautifully illustrated paper of Bourne (43) is of great importance for the anatomy of the *Hirudinea*; the differences between the *Rhyncobdellidae* and the *Gnathobdellidae* are pointed out, and the systematic position of the whole group discussed; he thinks it impossible to decide whether they are more highly developed *Triclada* or degenerate *Chætopods*, and the resolution of the question must be deferred till we know how the *cœlom* is developed in them and in *Platyhelminths*.

Whitman (67) gives a careful definition of the genus *Hirudo*, and describes the segmental sense-organs, which he regards as being serially homologous with the eyes. Attention is directed to the mode of abbreviation of the somites.

Haycraft (P. R. Soc. xxxvi. pp. 478-487) finds that the leech secretes from its mouth a fluid which, while destroying the ferment, produces no other change in the blood.

GENERA AND SPECIES.

Wiren (67A) describes or has notes on (*inter alia*):—

Spinther arcticus.

Polynoe scabra, badia.

Eupolynoe anticostiensis.

Mekenis loveni var. n. *gigantea*.

Nephthys cæca, longisetosa, ciliata, cirrosa, emarginata, malmgreni.

Eteone flava, arctica.

Castalia aphroditoides.

Goniada nordmanni.

Eumenia crassa, forma *arctica* n.

Prionospis cirriferæ, sp. n.

Amphiteis grubæi, regæ, sp. n., *sundewalli*.

Sabellides sibirica, sp. n.

Langerhans (52) describes as new:—

Autolytus quindecim-dentatus, syllisetosus.

Procerastea (allied to *Autolytus*), g. n., for *P. nematodes*.

Lagisca æquispina.

Cerotonereis vittata, brunnea.

Amphiro simplex.

Staurocephalus minimus.

Eulalia pulchra.
Archidice glandularis.
Lysilla nivea.
Potamilla incerta, socialis.
Sabellu variabilis.
Jasmineira oculata.
Euchone rosea.
Leptochone violacea.
Salmacina setosa.
Hyalopomatus marenzelleri.
Vermilia rugosa.
Omphalopoma spinosa, cristata.
Filograna gracilis.

There are notes on various described species.

The following new Annelids, from Bermuda, are described by H. E. Webster (Bull. U. S. Nat. Mus. No. 25, pp. 307-327, pls. vii.-xii.) :—

Bhawania goodei.
Nereis bairdi, gracilis.
Eunice mutilata, denticulata, longisetis, longicirrata.
Marphysa acicularum.
Nicidion kinbergi.
Ophelina maculata.
Cirratulus tenuis.
Terebella magnifica.

Protulides (g. n., closely allied to *Potamilla*), for *P. elegans*.

There are notes on (*inter alia*) :—

Hermodice carunculata.
Halosydna leucohyba.
Fallacia proctochona.
Arenicola cristata.

Webster & Benedict (66) describe as new :—

Eulalia dubia.
Eteone cinerea.
Podarke caeca.
Hesione agilis.
Syllides concludata.

Streptosyllis, g. n. (differs from *Amblyosyllis* in not having the head "winged," in the peculiar setæ, and both smooth and moniliform dorsal cirri), for *S. arene*, sp. n.

Sp'erosyllis brevifrons, longicirrata.
Pædophylax hebes.
Nereis tenuis.

Staurocephalus cæcus.

Spio rathbuni.

Spiophanes verrilli.

Nicolea viridis.

Pista intermedia.

Thaumastoma, g. n. (*incertæ sedis*), for *T. singulare*.

They have notes on :—

Nyphia cirrosa, *amondreni*.

Eunoa nodosa.

Lepidametria commensalis.

Anaitis speciosa.

Phyllodoce grænlandica.

Eumida maculosa.

Eulalia gracilis.

Grubea dolichopoda.

Goniada gracilis.

Streblospio benedicti.

Capitella capitata.

Amphitrite brunnea.

Potamilla neglecta.

Myxicola steenstrupi.

Haswell (49) describes as new :—

Serpula vasifera.

Salmacina australis.

Sabella velata, *punctulata*.

Spirographis australiensis.

He has notes on :—

Eupomatus elegans.

Pomatoceros elaphus.

Vermilia caespitosa, *rosea*.

Serpula jukesii.

Von Marenzeller (55) describes as new :—

Amphitrite ramosissima.

Pista maculata.

Polymnia congruens.

Thelepus japonicus.

Polycirrus nervosus.

Sabella aulaconota.

Potamilla myriops.

Laonome japonica.

Myxicola platycheta.

Serpula granulosa.

Hydroides multispinosa.

Eupomatus exaltatus.

Pomatoceros helicoides, *lutiscapus*.

Omphaloma langerhansii.

Apomatus enosimæ.

He has notes on :—

Amphiteis angustifolia.

Amage auricula.

Amphitrite vigintipes.

Lepræa ehrenbergi.

Pista fasciata.

Lorinia montagui.

Nicolea gracilibranchis.

Potamilla torelli.

Hypsicomus phæotenia.

Levinson (54) describes as new:—

Aonides fulgens.

Apistobanchus, g. n., for *Aricia tullbergi*.

Spinther major, for *S. arcticus*, Hansen.

Trochochaeta, g. n. (allied to *Paramphinoe*), for *T. sarsi*.

Nicomachella, g. n., for *Maldane tenuis*.

Glyphanostomum, g. n., for *Sabellides pallescens*.

Anobothrus, g. n., for *Ampharete gracilis*.

Notaulax rectangulara.

Spirorbis moerchi, *affinis*, *violaceus*.

Chitinopoma, g. n., for *C. fabricii* (*Serpula triquetra*, Fabr.).

Levinson (54) gives a conspectus of the *Oligochaeta*, and forms the two new families *Æolosomatidae* and *Chaetogastridae*.

NAIDÆ.—*Uncinails*, g. n., for *Nais uncinata*.

TUBIFICIDÆ.—*Psammobius hyalinus*, *Monopylephorus rubroniveus*, gg. & spp. n.

ENCHYTRÆIDÆ.—*Analycus*, g. n., for *A. glandulosus*, *armatus*, *flavus*, spp. n., *Enchytræus bisetosus*, *affinis*, *fucorum*, *serdidus*, *striatus*, spp. n.

LUMBRICIDÆ.—*Lumbricus eiseni*, sp. n.

Vejdovsky (63) thus arranges the *Oligochaeta*:—

I. *Amedullata*, for *Æolosoma*.

II. *Naidomorpha*, for *Ophidonais*, *Dero*, *Bokemilla*, g. n. (for *B. comata*, sp. n.), *Nais* (*N. josinae*, sp. n.) *Slavina*, g. n. (for *S. appendiculata*), *Stylaria*, *Pristina*, *Naidium*.

III. *Chaetogastridae*, for *Chaetogaster* (*C. crystallinus*, sp. n.).

IV. *Discodrilidae*, for *Branchiobdella*.

V. *Enchytræidae*, for *Pachydrius*, *Enchytræus*, *Anachæta*.

VI. *Tubificidae*, for *Tubifex*, *Psammoryctes*, *Limnodrilus*.

VII. *Phreoryctidae*, for *Phreoryctes*.

VIII. *Lumbriculidae*, for *Stylodrilus* (*S. gabreta*, sp. n.), *Phreatothrix*, *Lumbriculus*, *Rhynchelmis*.

IX. *Lumbricidae*, for *Lumbricus*.

Lemoine (53) describes the characters of *Enchytræus* at different periods of the year.

Acanthodrilus schlegelii, *buttkoferii*, sp. n., Horst, Notes Leyd. Mus. vi. pp. 103–106 (both from Liberia).

On the differences between *Megascolex* and *Perichæta*, see Beddard, Ann. N. H. (5) xiii. pp. 338–402.

Absence of Earthworms from N.W. Prairies of Canada; Nature, xxix. pp. 213, 237, & 406.

Habits of Earthworms; op. cit. pp. 502 & 550, xxx. pp. 57 & 77.

Gigantic South African Earthworms; F. E. Beddard, Nature, xxx. p. 570.

Gigantic Earthworms (probably *Megascolides*) in New South Wales ; Fletcher, P. Linn. Soc. N. S. W. viii. p. 218.

Manayunkia speciosa redescribed by Leidy, P. Ac. Philad. 1883, pp. 204-212 (pl. ix.), & p. 302; E. Potts, *op. cit.* 1884, p. 21; S. G. Foulke, p. 48.

Lophobdella quatrefuges, g. & sp. nn., type of new family (*Lophobdellidae*) of *Hirudinea*, most nearly allied to the *Rhynchobdellidae* (60).

Nephele scripturata, sp. n., differs from *N. sexoculata* and *N. octoculata* in the mode of fertilization of the egg; Schneider, Zool. Beitr. I. ii. p. 129.

Leech culture; R. Hess, Bull. U. S. Fish Comm. iv. p. 175.

On Conodonts and fossil Annelid jaws; U. P. James, J. Cincinn. Soc. vii. pp. 143-149.

On some supposed Annelid tracks from the Gaspé Sandstone; Whiteaves, Tr. R. Soc. Canada, 1883, iv. pp. 109-111.

MYZOSTOMIDA.

68. BEARD, J. On the Life-History and Development of the Genus *Myzostoma* (F. S. L.) MT. z. Stat. Neap. v. pp. 544-580, pls. xxxi. & xxxii.

69. GRAFF, L. VON. The Voyage of H.M.S. 'Challenger.' XXVII. Report on the *Myzostomida* collected during the Voyage of H.M.S. 'Challenger' during the years 1873-76. 1884: 82 pp., 16 pls.

70. ——. On the *Myzostomida* of the 'Porcupine' and 'Triton' Dredgings. P. R. Soc. Edinb. 1883-84, pp. 378-380.

Graff (69) alters the definition he formerly gave of the *Myzostomida*, so as to admit *Stelechopus*, in which the alimentary canal is straight, and which is devoid of suckers and of male genital apertures. The first (new) family, *Stelechopidae*, contains only *Stelechopus hyocrini*, g. & sp. nn.; the second, or *Myzostomidae*, contains the following new species:—

Myzostoma horologium, *longipes*, *chinesicum*, *labiatum*, *echinus*, *plicatum*, *rubrofasciatum*, *testudo*, *luetkeni*, *marginatum*, *brevipes*, *areolatum*, *coriaceum*, *radiatum*, *calycotyle*, *compressum*, *brevicirrum*, *pictum*, *nigrescens*, *crenatum*, *wyville-thomsoni*, *vastum*, *agassizii*, *maebianum*, *dentatum*, *fimbriatum*, *excisum*, *irregulare*, *caribbeanum*, *rotundum*, *oblongum*, *abundans*, *antennatum*, *fissum*, *intermedium*, *quadrifidum*, *quadricaudatum*, *bicaudatum*, *filicauda*, *filiferum*, *carinatum*, *coronatum*, *folium*, *pentacrini*, *deformator*, *cysticolum*, *tenuispinum*, *willemaesii*, *inflator*, *murrayi*.

Myzostoma alatum, *pulvinar*, *carpenteri*, spp. nn. (70).

Beard (68) finds three stages in the larval history of *Myzostoma*, describes the appearance and loss of the provisional setæ, and the changes undergone when the free larva passes to its Crinoid host; the parasite appears to be a Chaetopod which has undergone degeneration, owing to its mode of life.

ENTEROPNEUSTI.

71. BATESON, W. The Early Stages in the Development of *Balanoglossus*. Q. J. Micr. Sci. xxiv. pp. 208-236, pls. xviii.-xxi.
72. SPENGEL, J. W. Zur Anatomie des *Balanoglossus*. MT. z. Stat. Neap. v. pp. 494-508, pl. xxx.
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Bateson (71) insists on the resemblances between *Amphioxus* and *Balanoglossus*, especially in relation to the mode of development of the central nervous system and of the mesoblastic somites.

Spengel (72) describes various parts of the adult *Balanoglossus*; the proboscis is the chief locomotor organ, its small cavity communicates with the exterior by one or two pores; the so-called heart cannot be shown to have any relation to the blood-vascular system; the branchial pouches have a more complicated structure in *B. minutus* and *B. claviger* than in *B. kuppferi* and *B. kovalevskii*.

CŒLENERATA.

BY

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19. —. Deep-Sea Corals. Nature, xxx. p. 464. [See also LINDSTRÖM.]
20. FAUROT, —. Sur l'anatomie de la *Peachia hastata*. C.R. xcvi. pp. 756 & 757. [Translated in Ann. N. H. (5) xiii. pp. 417 & 418.]
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77. WILSON, E. B. The Mesenterial Filaments of the *Aleyonaria*. *MT. z. Stat. Neap.* v. pp. 1-27, pls. i. & ii.
78. WRIGHT, BRYCE. On New *Stylasteridæ*. *Ann. N. H.* (5) xiii. pp. 218 & 219.

PALÆONTOLOGY.

79. CARTER, H. J. Note on the assumed Relationship of *Parkeria* to *Stromatopora*, and on a Microscopic Section of *Stromatopora mamillata*, F. Schm. *Ann. N. H.* (5) xiii. pp. 353-356.
80. CHAMPERNOWNE, A. On some Zaphrentoid Corals from British Devonian Beds. *J. G. Soc.* xl. pp. 497-506, pls. xxi.-xxiii.
81. DUNCAN, P. M. On *Streptelasma roemeri*, a new Coral from the Wenlock Shale. *J. G. Soc.* xl. pp. 167-173, pl. vii.
82. —. On *Cyathophyllum fletcheri*, Ed. & H., sp. from the Wenlock Shale, with Remarks on the Group to which it belongs. *T. c.* pp. 174-177.
83. —. On the Internal Structures and Classificatory Position of *Micrabacia coronula*, Goldfuss, sp. *T. c.* pp. 561-566, figs. 1-3.
84. ETHERIDGE, R., JUN., & FOORD, A. H. Descriptions of Palæozoic Corals in the Collection of the British Museum (Nat. Hist.). No. 1. *Ann. N. H.* (5) xiii. pp. 472-476, pl. xvii.; *Favositella*, g. n. (p. 472) [for *Favosites interpuncta*, Quenst.]. No. 2. *Op. cit.* xiv. pp. 314-317, pl. xi.
85. —, & —. On two Species of *Alveolites* and one of *Amplexopora* from the Devonian Rocks of Northern Queensland. *Ann. N. H.* (5) xiv. pp. 175-179, pl. vi.
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87. HALL, J. Descriptions of Corals from the Niagara and Upper Helderberg Groups. Rep. New York State Mus. Albany, xxxv. pp. 407-464. *Cyathospongia*, g. n., and 33 spp. nn., from the Niagara Group; and *Elasmophyllum*, *Coleophyllum*, gg. nn., and 132 spp. nn., from the Upper Helderberg Group.
88. Koby, F. Monographie des Polypiers jurassiques de la Suisse. 3e partie. Abh. schw. pal. Ges. ix. pp. 109-149, 12 pls.
89. LINDSTRÖM, G. Index to the Generic Names applied to the Corals of the Palæozoic Formations. Sv. Ak. Handl. viii. [1883], No. 9, 14 pp.
90. NICHOLSON, H. A. Contributions to Micro-Palæontology. Notes on some species of Monticuliporoid Corals from the Upper Silurian Rocks of Britain. Ann. N. H. (5) xiii. pp. 117-127, pl. vii., 2 woodcuts.
91. THOMSON, J. On the Development and Generic Relations of the Corals of the Carboniferous System of Scotland. P. Phil. Soc. Glasg. 1883, 208 pp., 14 pls.
92. TOMES, R. F. A Comparative and Critical Revision of the *Madreporaria* of the White Lias of the Middle and Western Counties of England, and those of the Conglomerate at the base of the South Wales Lias. J. G. Soc. xl. pp. 353-375, pl. xix.
93. —. A Critical and Descriptive List of the Oolitic *Madreporaria* of the Boulonnais. T. c. pp. 698-723, pl. xxxii.
Discocænia, *Ceratocænia*, *Scyphocænia*, gg. nn., from Great Oolite.

MORPHOLOGY, SPECIAL AND GENERAL.

Hæckel (34) describes a number of *Gastreaadæ* from the 'Challenger' collections. Organisms which surround themselves with a cemented skeleton of *Radiolaria*, &c., may be either *Protozoa* (colossal *Lobosæ* or *Thalamophora*) or *Metazoa*. The latter form two groups; the first are the simplest, with a thin solid body-wall, may be simple (*Haliphysema*), branched (*Dendrophysema*), or plexiform (*Clathrophysema*); the second group, *Cementaria*, possess a blind system of endodermal canals, more or less lined with flagellate cells; the ova are endodermal in origin. They may be simple tubes with a single orifice (*Cementascus*); those with several mouths (but no pores) may be irregular in form (*Cementoncus*), dendritic (*Cementura*), or in flat lobate crusts (*Cementissa*). [Remembering the criticisms on Hæckel's *Haliphysema*—cf. S. Kent, Ann. N. H. (5) ii. p. 68, and E. R. Lankester, Q. J. Micr. Sci. (n.s.) xix. p. 476—these statements must be accepted with caution.]

Londonfeld (48, 50) describes in the polyps of *Sarsia radiata* the first recorded instance of a well-developed flexor muscle in any hydroid; "by means of this muscle, the polyp is enabled to bend downward, and shut up, as it were, like a penknife" (p. 583).

Klaatsch (41) has minutely studied *Clytia johnstoni* at Villafranca, and finds that the perisarc is formed by a chitination of the epidermic layer of the ectoderm. The external ectodermal epithelium of the

tentacles and body is reflected at the proximal end of the stomach, and passes directly into the calyx, thus the ectodermal lining of the stem is a continuation of the interstitial cells (middle zone), the outer layer being completely chitinated.

The histology of Siphonophores has at last been carefully studied by Korotneff (42). The processes of the "neuro-muscular" and "musculo-epithelial" cells are usually of great length. Sense- and nerve-cells of the ordinary Cœlenterate type occur; the nerve-fibres are often collected in bundles; each fibre, which extends throughout the whole length, is composed of extraordinarily fine fibrils, and is surrounded by a nucleated plasma; the bundle of fibrils corresponds to an axis cylinder, and the plasma to a sheath. Figures are given illustrating the formation of the endoderm lamella in a nectocalyx.

There is a short abstract in *Nature*, xxix. p. 202, of Agassiz's Memoir on the *Porpitidae* and *Velellidae* [cf. *Zool. Rec.* xx. *Cœl.* p. 1].

Bedot (3-5) gives details concerning the so-called "liver" in *Velella*, and shows that only a portion of that organ is secretory, the lower portion being crowded with thread-cells.

Conn & Beyer (12) have a paper on the nervous system of *Porpita*.

Faurot (20) describes the macroscopic anatomy of *Peachia hastata*, Gosse. Two of the twelve mesenteries unite to form a "grooved organ, which ends at the mouth in a prominent lip, and opens internally near the end of the body, which is stated to possess a terminal aperture. The arrangement of the muscular bands is described.

Ridley (68, p. 356) describes for the first time the existence of two forms of zooids in a member of the family *Melithæidae*.

A. Sedgwick, in a suggestive paper "On the Origin of Metameric Segmentation, and some other Morphological Questions" [*Q. J. Micr. Sci.* (n.s.) xxiv. pp. 43-82, pls. ii. & iii.], homologises the mouth of the common ancestor of the higher *Metazoa* with the elongated opening of the *Actinozoa*, the archenteric diverticula with the gut pouches of Cœlenterates, and the longitudinal canal of the nephridia with the circular canal of *Medusæ* and with the perforations in the mesenteries of *Actinozoa*, and the external nephridial orifices with the pores in the body-wall of *Cœlenterata*. *Cœlenterata* and segmental animals arose from a common ancestor, not the latter from the former. A description of this common ancestor is given on p. 57. The homology of the blastopore with the Cœlenterate mouth is discussed in detail; both are shown to occur on the neural aspect of the body. The differentiation of the Actinozoan mouth into ingestive orifice and siphonoglyphe is referred to, and allusion is made to *Peachia* [sp. not stated, cf. Faurot (*ante*)], which is compared with the elongated, dumb-bell shaped blastopore of *Peripatus*. The other propositions are worked out with a certain amount of detail.

A few histological details of *Cœlenterata* will be found in "La Biologie Cellulaire"; J. B. CARNOY. J. van In & Cie., Lierre, 1884.

Herdman (37) gives the first account of the internal anatomy of *Sarco-dictyon*.

PHYSIOLOGY.

~~Alphonse~~ ^{Alphonse} ~~1870~~ ¹⁸⁷⁰ has made the remarkable discovery that the two dorsal mesenterial filaments of Alcyonarians are not homologous with the six ventral; they are prolongations from the epiblast of the œsophagus, and by the action of their numerous cilia cause upward currents of the fluids in the body, and apparently they are non-digestive. The other mesenterial filaments are of endodermal origin, and form the sole digestive areas of the animal; they closely surround food which has been introduced into the body, the ultimate digestion being intracellular. As a general rule, the dorsal filaments are the last to appear in embryos, but the first in buds. The paper concludes with a discussion of the relations of the *Anthozoa* to the *Enterocœla*. [Cf. Sedgwick, *Morphology*, ante.] Haacke (33) calls attention to the fact that he had previously (1879) published on the mesenterial filaments of *Xenia* and *Sympodium*.

E. Metschnikoff's valuable paper on "Researches on the Intracellular Digestion of Invertebrates" [Arb. z. Inst. Wien, v. (1883), pp. 141-169, pls. xiii. & xiv.] has been translated in Q. J. Mic. Sci. (n.s.) xxiv. pp. 89-111. He proves that ectodermal intracellular ingestion occurs in the nematocalyces of *Plumularia setacea*, Ell., and *P. halecioides*, ?; the ectoderm cells of these structures form a kind of plasmodium, which ingests foreign particles and even eats up the dying hydranths; the so-called nematocalyces must therefore be classed as prophylactic organs. Probably the peculiar organs of *Eudendrium racemosum* and the tendrils of *Campanularia angulata* serve a similar function. The ectoderm of the tentacles of *Actinia mesembryanthemum*, and that of the body-wall of larval *Bunodes sabelloides*; Andr., take in a large quantity of foreign particles by means of short pseudopodia. The ectodermal ovarian ova of *Tubularia* and *Hydra* digest the neighbouring cells. Mesodermal intracellular digestion.—Many ovarian ova of *Aurelia aurita* were seen to be surrounded and completely devoured by amœboid cells. In Ctenophores, carmine granules and empty thread-cells may pass into the mesoderm cells. The origin of *Metazoa* from *Protozoa* is also discussed.

Reproduction.

Weismann (76) gives a summary of his researches on the migration of the sexual cell in Hydroids [cf. Zool. Rec. xx. Cæl. p. 4].

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Keller (38) states that the generative glands of *Orchistoma agaraci-forme*, sp. n., arise as gastric diverticula, and not from the canals.

Q. J. (36) has discovered generative ampullæ in *Millepora murrayi* similar to those of the *Stylasteridæ*, and suggests that the *Hydrocorallinæ* may be more nearly related to the calyptoblastic than to the gymnoblastic Hydroids.

Brooks (9) describes the life-history of *Eutima*. The endoderm is formed by delamination of the ectoderm, especially at one end. The embryo becomes a hydrorhiza; the first hydranth is formed as a bud.

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Bourne (6, 7) has found a minute Hydroid on the roots of *Pontederia* from S. America, in the tank of the Royal Botanic Gardens, Regent's Park, on November 27th, which there is every reason to believe is the hydroid stage of *Limnocoedium sowerbii*. It is a very rudimentary form without any tentacles, the largest reaching $\frac{1}{2}$ inch in height. If the identification is correct, it is the first time a hydroid phase has been demonstrated for any of the *Trachomedusæ*. Mr. F. A. Parsons [J. R. Micr. Soc. (2) v. p. 168] had previously discovered it in April, but was unable to identify it.

The developmental history of an example of the family of the *Versuridæ* was, for the first time, investigated by Claus (11) in 1883; and now Lendenfeld (46, 52) describes some of the stages of *Phyllorhiza punctata*. At the stage of 15 mm. diameter there are two marginal bodies (sense-organs) similar to and between each of the usual eight in the radii of the second and fourth order: at a stage of 30 mm. diameter there is only one intermediate marginal body in the radius of the third order, the other two having disappeared; finally only the eight primaries persist. Thus the marginal bodies decrease in number with the age of the larva (24-16-8). The margin of the umbrella of the adult retains the power of developing irregular marginal bodies when injured.

Kowalevsky (44) gives an incomplete account of the development of *Lucernaria*.

The development of selected examples of the Cœlenterates has been illustrated in the valuable series now emanating from the Museum of Comparative Zoology, Harvard (21, 23). Most of the figures are taken from well-known sources; a few are original, amongst the most interesting of which are those illustrating the development of two species of *Edwardsia* (p. 43, pl. xii.), one being parasitic in its earlier stages in *Mnemiopsis leidyi*, which will shortly be fully described by E. L. Mark.

GENERAL BIOLOGY.

To the other known Cœlenterates in which symbiotic algæ occur, Brandt (8) adds *Paralecyonium elegans* and *Aiptasia turgida*. Fresh proof is given that the "phytozoa," or hosts, feed upon the assimilative products of the algæ; but Von Graff (27), from experiments on *Hydra viridis*, concludes that the "algæ," or "pseudo-chlorophyll" bodies, do not serve for the nutrition of the polyps.

Von Lendenfeld (56) points out that *Crambessa mosaica*, H., always occurs in Melbourne of a deep blue colour and never shows a trace of *Zooxanthellæ*, whereas the Sydney form has a variable brown colour and always contains great quantities of symbiotic algæ. He names the former *Crambessa mosaica conservativa*, var. n., and the latter *C. m. symbiotica*, var. n. Huxley was the latest (1845) of several authors who describe the Sydney form as blue to grey. "Have we to assume that a new species or variety has been produced within the last forty years?" Local colour varieties of *Cyanea annaskala*, R. von L., also occur in Port Phillip (*C. a. purpurea*, var. n.) and Port Jackson (*C. a. marginata*, var. n.).

Commensalism between a *Caranx* and a *Crambessa*; Lunel, Rec. Z. Suisse, i. pp. 65-74, pl. vi.

Gagnel is a letter (29), contributes to the problem of the formation of *littorals*. He finds in the Shortlands Islands, Solomon group, that of the small calcareous islands, some are entirely composed of coral detritus, sand, and shells by recent wave action; the others consist of a comparatively thin crust of coral limestone on an impure earthy limestone, largely denuded by atmospheric agencies.

Verrill (73), from the fact that so many *Anthozoa* from deep water are brightly-coloured, believes that more or less sunlight does actually penetrate to the greatest depths (down to 3000 fathoms) of the ocean in the form of a soft sea-green light. He also refers to the phosphorescence of many *Cœlenterates* as being protective, to warn other animals of their power of stinging, a view which Meldola (58) had previously expressed.

S. J. Smith, in a report on Decapod *Crustacea* from N.E. America, U. S. Fish. Comm. Rep. x. (for 1882) 1884, indicates (p. 354) the frequency of *Actinæ* commensal with Hermit Crabs; he refers to *Epizoanthus americanus*, Verr. (pl. iv. fig. 1), *E. paguriphilus*, Verr., *E. sp. incert.*, ? sp. n., and *Urticina consors*, Verr.

V. Heusen, in a paper on fish-eggs from the Baltic, U. S. Fish Comm. Rep. x. (for 1882) 1884, p. 451 [translated from the German Commission, 1883], describes the destruction of pelagic fish-eggs in large numbers by *Sarsia tubulosa* and other *Medusæ*.

Fewkes (22, pp. 302-305) gives an account of the relations of *Cunina* to *Glossocodon*, and compares a free colony of the former to a Siphonophore. C. Morris discusses colonial organisms in Am. Nat. xviii. pp. 140-149 & 240-249.

Keller (38) believes that *Cotylorhiza tuberculata* is a deep-sea form which comes to the surface to breed.

Von Lendenfeld, P. Linn. Soc. N. S. W. ix. pp. 256-258, has a short note upon methods of preserving *Cœlenterates*. A. H. Breckenfeld, Am. Micr. J. v. pp. 49 & 50, gives a new method for mounting *Hydra*.

GEOGRAPHICAL DISTRIBUTION.

ARCTIC.—Danielssen & Koren (13A), D'Arcy Thompson (72), Kirchenpauer (40).

NORTH ATLANTIC.—(Europe.)

Notes on certain *Actinozoa* dredged by the 'Travailleur' and 'Talisman' will be found in the Rev. Sci. 1884, No. 8, and in Biol. Centralbl. iv. p. 189.

Henderson, P. Phys. Soc. Edinb. viii. p. 115, adds *Sertularia fisca*, Johnst., to the fauna of the Firth of Forth.

NORTH ATLANTIC.—(America.)—Verrill (73, 75).

MEDITERRANEAN.—Carus (10), Pieper (62), Graeffe (25), Andres (1). While the body of Andres' work constitutes a complete monograph of the group, the plates, with the descriptions which refer to the figures, form a monograph of those *Actinæ* which occur in the Gulf of Naples.

E. TROPICAL AMERICA.—Fewkes (22).

N. PACIFIC (America).—Dall (13).

INDO-PACIFIC.—Ridley (68).

AUSTRALIA.—Von Lendenfeld (45-56), Bale (2), Baron von Mülle

AFRICA (Fresh-water).

E. von Martens reports, from a letter from R. Böhm, a Craspedote *Medusa* from Lake Tanganyika; Am. Nat. xviii. p. 548. [Böhm (cf. Zool. Rec. xx. *Cæl.* p. 2) gives the specific name of *tanganjica* to this small *Medusa*, but leaves the generic name; V. Martens places it amongst the *Antho-* or *Narcomedusæ*, and makes remarks upon the fresh-water Cœlenterates in general.]

CLASSIFICATION.

Lendenfeld (45) proposes the following classification of the *Hydro-medusæ*; but this varies in many respects from that given in more detail in (49):—

Order HYDROMEDUSÆ.

Sub-order I. HYDROPOLYPINÆ.

Fam. 1. Hydridæ: *Protohydra*, *Hydra*.

„ 2. Clavidæ: *Olava*, *Tubiclava*.

„ 3. Eudendridæ: *Eudendrium*, *Stylactis*.

„ 4. Blastopolypidæ.

Sub-fam. 1. Campanularinæ: *Campanularia*, *Laomedea*, &c.

„ 2. Sertularinæ: *Sertularia*, *Sertularella*, &c.

„ 3. Dicoryninæ: *Dicoryne*.

„ 5. Plumularidæ: *Plumularia*, *Aglaophenia*, &c.

„ 6. Graptolithidæ (Lapworth's Fams. as Sub-fams.).

Sub-order II. HYDROMEDUSINÆ.

Fam. 1. Margelidæ.

Sub-fam. 1. Hydractininæ: A, *Podocorynæ*; B, *Hydractinidæ*.

„ 2. Margelinæ: *Lizusidæ*, &c.

„ 3. Cordylophorinæ: *Cordylophora*.

„ 4. Bimerinæ: *Garveia*, &c.

„ 2. Anthomedusidæ.

Sub-fam. 1. Codoninæ: *Parsiadæ*, &c.

„ 2. Tiarinæ: *Tiaridæ*.

„ 3. Cladoneminæ: *Cladonemidæ*.

„ 3. Corynidæ.

Sub-fam. 1. Coryninæ: *Coryne*, *Actinogonium*.

„ 2. Myriothelinæ: *Myriothela*.

„ 4. Tubularidæ.

Sub-fam. 1. Pennarinæ: *Pennaria*, *Globiceps*.

„ 2. Euphysidæ: *Halatractus*, &c.

„ 3. Tubularinæ: *Tubularia*.

„ 5. Leptomedusæ: *Lafoea*, *Clytia*, *Campanulina*, &c.

Sub-order III. HYDROCORALLINÆ: Milleporidæ, &c.

„ IV. TRACHOMEDUSÆ: *Trachomedusæ*, *Narcomedusæ*.

In this first part of his exhaustive monograph, Andres (1) has given us a complete bibliography from Aristotle to 1882, chronological and alphabetical. The Introduction gives a sufficient account of the structure to enable a student to understand any ordinary description. The following is condensed from his synoptic classification of the seven families [*sic*] of the *Actiniaria* :—

I. *Actiniaria* single or compound, not free-swimming.

Disc more or less covered with tentacles, but leaving the lips naked.

Body-wall soft. Individuals almost always isolated.

Column sulcated longitudinally by eight invections.

EDWARDSINÆ: Edwardsidæ.

Column smooth, rugose, or sulcated, never less than twelve invections.

Tentacles disposed in circles, simple.

ACTININÆ: Halcampidæ, Siphonactinidæ, Phellidæ, Sagartidæ, Actinidæ, Bunodidæ, Cereactidæ, Ilyanthidæ, Mesacmæidæ, Heteractidæ, Paractidæ.

Tentacles in radial series, frondose, rarely simple.

STICHODACTYLINÆ: Corynactidæ, Discosomidæ, Aurelianidæ, Phymanthidæ, Rhodactidæ, Phyllactidæ, Crambactidæ, Heteractidæ.

Tentacles very large, covered with secondary tentacles.

THALASSIANTHINÆ: Thalassianthidæ, Sarcophianthidæ.

Body-wall invested with, sometimes penetrated by, heterogeneous material.

Individuals almost always united in colonies.

ZOANTHINÆ: Zoanthidæ, Sphenopidæ.

Disc furnished with tentacles, which occur on the lips.

CERIANTHINÆ: Cerianthus.

Actiniaria freely floating at the surface of the water.

MINYADINÆ: Minyadidæ.

Duncan (18) adopts the following classification :—

Class. Anthozoa.

Sub-order. Zoantharia Sclerodermata or Madreporaria.

Section. Madreporaria Aporosa.

I. Family. Turbinolidæ (pars), Ed. & H.

II. " Oculinidæ (pars), Ed. & H.

III. " Pocilloporidæ.

IV. " Astræidæ, Ed. & H. (amended).

Section. Madreporaria Fungida.

I. Family. Plesiofungidæ.

II. " Fungidæ, Dana (pars).

III. " Lophoseridæ.

IV. " Anabaciadæ.

V. " Plesioporitidæ.

Section. Madreporaria Perforata.

I. Family. Eupsammidae.

II. " Madreporidae, Ed. & H.

III. " Poritidae.

Ridley (69) finds that the mode of budding is of great classificatory value in the *Madreporidae*; he divides them into (1) *Madreporinae*.—Gemmation centrifugal, from the sides of terminal calyces. (2) *Montiporinae*.—Gemmation centripetal, from a terminal coenenchymal mass.

Nicholson (61) criticises Hickson [*cf.* Zool. Rec. xx. Cæl. p. 9], and states that *Syringopora* and *Favosites* are Zonantharians closely allied to the *Poritidae*.

GENERA AND SPECIES.

HYDROZOA.

SCYPHOMEDUSÆ.

DISCOMEDUSÆ.

Stomatonema reticulatum, g. & sp. nn., Montevideo Harb., Fewkes (22) p. 300.

Pseudorhiza hæckelii, sp. n., S. Australia, Haacke (32).

Craterolophus macrocystis, sp. n., p. 165, New Zealand, *Aurelia cerulea*, sp. n., p. 280, *Phyllorhiza punctata*, sp. n., p. 296, Port Jackson, Lendenfeld (51).

HYDROMEDUSÆ.

ANTHOMEDUSÆ.

Eudendrium simplex, sp. n., Co. of Dalmatia, Pieper (62).

Clava simplex, sp. n., p. 349, *Eudendrium generalis*, sp. n., p. 351, *E. pusillum*, p. 352, *Dicoryne annulata*, sp. n., p. 491, *Sarsia radiata*, sp. n., p. 583, *S. minima*, sp. n., p. 584, *Euphysa australis*, sp. n., p. 586, *Turritopsis lata*, sp. n., p. 588, *Lizusa prolifera*, sp. n., p. 589, *Pennaria rosea*, sp. n., p. 594, *P. adamsia*, sp. n., p. 595, *Tubularia spongicola*, sp. n., p. 597, *T. gracilis*, sp. n., p. 597, Australia, Lendenfeld (49).

Pennaria australis, sp. n., p. 45, *Tubularia ralphii*, sp. n., p. 42, Australia, Bale (2).

LEPTOMEDUSÆ.

Obelia adelungi, *O. helgolandica*, spp. nn., Heligoland, Hartlaub (35, 36).

Lafœa gigas, sp. n., *Halecium robustum*, sp. n., *H. ophiodes*, sp. n., *H. sp.*, *Aglaophenia microdonta*, sp. n., *Plumularia* sp., Adriatic, Pieper (62). *Orchistoma agaraciforme*, sp. n., Mediterranean, Keller (38).

Abietinaria, g. n., Kirchenpauer (40).

Sertularia fertilis, sp. n., p. 406, *S. irregularis*, sp. n., p. 406, *Diphasia symmetrica*, sp. n., p. 414, *Sertularella microgona*, sp. n., p. 416, *Plumularia gracilis*, sp. n., p. 476, *P. rubra*, sp. n., p. 476, *P. torresia*, sp. n., p. 477, *P. tripartita*, sp. n., p. 477, *Aglaophenia kirchenpaueri*, sp. n., p. 480, *Pentandra parvula*, g. & sp. nn., p. 489, *P. balei*, sp. n., p. 490, *Eucope annulata*,

sp. n., p. 602, *Obelia australis*, sp. n., p. 604, *Tiaropsis macleayi*, sp. n., p. 605, *Mitrocomium annæ*, sp. n., p. 606, all from Australia, Lendenfeld (49).

Campanularia marginata, sp. n., p. 54, *C. rufa*, sp. n., p. 54, *C. costata*, sp. n., p. 56, *Lineolaria flexuosa*, sp. n., p. 62, *Sertularia maplestonei*, sp. n., p. 70, *S. bidens*, sp. n., p. 70, *S. geminata*, sp. n., p. 78, *S. macrocarpa*, sp. n., p. 80, *S. tenuis*, sp. n., p. 82, *S. crenata*, sp. n., p. 86, *S. tuba*, sp. n., p. 87 [= *S. pumiloides*, Bale, Zool. Rec. xix. Cwl. p. 7], *Thuiaria fenestrata*, n. n., p. 116, *T. quadridens*, sp. n., p. 119, *Plumularia bushii*, sp. n., p. 125, *P. aglaophenioides*, sp. n., p. 126, *P. ramsayi*, sp. n., p. 131, *P. cornuta*, sp. n., p. 132, *Antennularia cylindrica*, sp. n., p. 146, *Halicornaria*, pars, p. 175, *H. baileyi*, sp. n., p. 177, *H. furcata*, sp. n., p. 178, *H. haswelli*, sp. n., p. 180, *H. humulis*, sp. n., p. 182, Australia, Bale (2).

HYDROCORALLINÆ.

Allopora ochracea, sp. n., *Stylaster pulcher*, sp. n., Japan, *Distichopora breviserialis*, sp. n., *D. milesii*, sp. n., South Sea Is., Quelch (63).

Allopora verrillii, sp. n., *A. moseleyi*, sp. n., *A. papillosa*, sp. n., *Errina pourtalesii*, sp. n., N.W. America, Dall (13).

ACTINOZOA.

HEXACTININÆ.

Herdman (37) considers *Sarcodictyon agglomerata*, Forbes, and possibly *S. rugosum*, Pourt., as varieties of *S. catenata*, Forbes, which is thus the only known species.

Andres (1) describes the following new genera and species :—*Edwardsiella*, g. n., p. 93 ; *Edwardsia luetkenii*, n. n. (for *E. duodecimcirrata*, Lüttk., nec Sars), p. 96 ; *E. grubii*, n. n., p. 98 ; *Halcampa kefersteini*, n. n. (for *Xanthiopus bilateralis* + *X. vittatus*, Keferst.), p. 102 ; *H. elizabethæ*, n. n. (for *H. alvida*, A. Ag.), p. 104 ; *Halcampella*, g. n., p. 103 ; *Siphonactinia tricapitata*, u. n. (for *Peachia triphylla*, Andr., nec Gosse), p. 109 ; *Octophellia*, g. n., p. 116 ; *Phellia duchassaingii*, n. n. (for *Paractis clavata*, Duch. & Mich.), p. 129 ; *Heliactis minor*, sp. n., p. 141 ; *Adamisia fischeri*, u. n. (for *Sagartia pellucida*, Fisch., nec Holl.), p. 172 ; *Aiptasia agassizii*, n. n. (for *Actinia pallida*, A. Ag.), p. 175 ; *Sagartia verrillii*, u. n. (for *Actinia bicolor*, Less.), p. 178 ; *Anemonia milne-edwardsii*, n. n. (for *Ceratactis clavata*, M.-Edw.), p. 194 ; *Bunodes studerii*, n. n. (for *B. kerguelensis*, Stud.), p. 235 ; *Ilyanthus partenopeus*, n. n. (for *Actinia diaphana*, D. Ch., nec Rapp.), p. 242 ; *Mesacmaea*, g. n., p. 246 ; *Eloactis*, g. n., p. 247 ; *Ropalactis*, g. n., p. 249 ; *Ragactis*, g. n., p. 251 ; *R. pulchra*, sp. n., p. 251 ; *R. cruciata*, n. n. (for *Cereus crucifer*, Duch. & Mich., nec Les.), p. 255 ; *Stauractis*, g. n., p. 253 ; *S. incerta*, n. n. (for *Actinodactylus neglectus*, Duch. & Mich.), p. 255 ; *Paranthus*, g. n., p. 256 ; *Paractinia*, g. n., p. 257 ; *Paractis studerii*, n. n. (for *P. alba*, Stud.), p. 263 ; *Aureliania regalis*, r. n. (for *A. augusta*, Andr., nec Gosse), p. 281 ; *Taractea*, g. n., p. 284 ; *Oulactis foliosa*, n. n. (for *O. flosculifera*, M.-Ed., nec Les., + *O. conquirega*, Duch. & Mich.), p. 290 ; *Polythoa carolinii*, n. n. (for *Madrepora denudata*, Cav.), p. 310 ; *Zoanthus incultus*, n. n. (for *Isaura neglecta*, Duch. & Mich.), p. 328 ; *Antinedia duchas-*

saingi, n. n. (for *Zoanthus tuberculatus*, Duch.), p. 330 ; *Verrillia*, g. n., p. 330 ; *Bathyanthus*, g. n., p. 344 ; *Cerianthus lutenii*, n. n. (for *C. vermicularis*, Lützk., nec Forbes), p. 348 ; *Phlyctanomyias*, g. n., p. 351 ; *P. brandtii*, n. n. (for *Stichophora cyanea*, Brandt), p. 351 ; *Dactylominyias*, g. n., p. 352 ; *Phyllomyias*, g. n., p. 354 ; *Epiactis fertilis*, n. n. (for *E. prolifera*, Verr.), p. 363.

HEXACORALLIDÆ.

Anacropora forbesi, g. & sp. nn., Ridley, (69) p. 287, pl. xi.

Quelch (65) describes as new:—*Moseleya latistellata*, g. & sp. nn., p. 293, Torres Straits ; *Physogyra aperta*, g. & sp. nn., Banda, p. 294 ; *Sandalolitha dentata*, g. & sp. nn., Tahiti, p. 295 ; *Tichoseris obtusata*, g. & sp. nn., Fiji, p. 296 ; *Napopora irregularis*, g. & sp. nn., Tahiti, p. 296.

Duncan (17) describes *Diapungia granulata*, g. & sp. nn., Korean Sea. He also (18) gives a valuable revision of the families and genera of the recent *Hexacoralla*, giving a short diagnosis of each family and genus, and the distribution in time and space of the latter. The following genera are new (see p. 193):—*Antillastræa* (Miocene, S. Domingo) ; *Brachymæandrina* (Cæloria pars, recent) ; *Diplotheastræa* (*Diplocænia*, Dunc., nec From., Miocene, W. Indies) ; *Koilocænia* (*Phyllocænia*, Laube, Trias, Europe), *Nototrochus* (*Notocyathus*, Woods, Tertiary, Australia and N. Z.) ; *Physophyllia* (recent unique specimen in Brit. Mus.) ; *Pourtalosmia* (*Blastosmia*, Dunc., Medit.) ; *Præzia* (*Plerastræa*, Dunc., Eocene, Sind) ; *Züttelofungia* (*Cyclolites*, Lmk., Eocene, Sind). 40 former genera are relegated to subgenera, and 95 abolished ; thus out of 478 old genera, 343 are retained.

OCTACTINIA.

ALCYONIDÆ.

Spongodes studeri, n. n. (for *S. spinosa*, Stud., nec Gray), Ridley, (68) p. 333, pl. xxxvii.A ; var. *levior*, p. 579.

PENNATULIDÆ.

Distichoptilum gracile, g. & sp. nn., Verrill, (73) p. 652 [cf. Zool. Rec. xx. Cœl. p. 15].

Umbellula bairdii, sp. n., *Kophobelenimon tenue*, sp. n., *Scleroptilum gracile*, sp. n., N.E. America, Verrill, (75).

GORGONIDÆ.

Lepidogorgia gracilis, g. & sp. nn., Verrill, (75).

Muricella tenera, sp. n., p. 335, pl. xxxvi.E ; *Echinomuricea indo-malacensis*, sp. n., p. 336, pls. xxxvi.B & xxxviii.D ; *Plexaura praelonga*, sp. n., p. 339, pls. xxxvi.F & xxxviii.G ; *Leptogorgia australiensis*, sp. n., p. 342, pl. xxxvi.C ; *Psammogorgia rectangularis*, sp. n., p. 344, pl. xxxvi.A ; *Juncella fragilis*, sp. n., p. 347, pl. xxxvi.D ; *Cullipodium australiense*, sp. n. ; *Iceilgorgia orientalis*, sp. n., p. 351, pls. xxxvii.F & xxxviii.E ; *Melitodes albitincta*, sp. n., p. 357, pls. xxvii.C & xxxviii.B ; *Mopsella clavigera*, sp. n., p. 360, pls. xxxvii.B & xxxviii.A ; *Acabaria serrata*, sp. n., p. 362, pls. xxxvii.E & xxxviii.C ; *Psilacabaria gracillima*, g. & sp. nn., p. 364, pls. xxxvii.D & xxxviii.F ; *Muricea bifurcata*, sp. n., p. 579, Ridley, (68).

SPONGIÆ.

BY

PROF. SOLLAS, D.Sc.

LIST OF WORKS ON RECENT SPONGES.

1. CARTER, H. J. Generic Characters of the Sponges described in Mr. Carter's "Contributions to our Knowledge of the *Spongida*," Ann. N. H. (5) xii. p. 308. Ann. N. H. (5) xiii. pp. 129 & 130.
2. —. Remarks on Dr. Vejdovsky's paper [see No. 45]. *T. c.* pp. 99-102.
3. —. *Grantia ciliata* var. *spinispiculum*, Crtr. *T. c.* pp. 153-163, pl. viii.
4. —. The Branched and Unbranched Forms of the Fresh-water Sponges considered generally. *T. c.* pp. 269-273.
5. —. On the *Spongia coriacea* of Montagu = *Leucosolenia coriacea*, Bwk., together with a new variety of *Leucosolenia lacunosa*, Bwk., elucidating the spicular structure of some of the fossil *Calcispongia*; followed by illustrations of the pin-like spicules on *Verticillites helvetica*, De Loriol. *Op. cit.* xiv. pp. 17-29, pl. i.
6. —. Catalogue of the Marine Sponges collected by Mr. Jos. Willcox on the West Coast of Florida. P. Ac. Philad. 1884, pp. 202-209.
7. DÜDERLEIN, L. Ueber Lithistiden aus Japan. Amtl. Ber. 56 Vers. deutsch. Naturf. u. Arzt. pp. 110-112.
8. —. Studien an japanischen Lithistiden. Z. wiss. Zool. xl. pp. 62-104, pls. v.-vii. [Abstr. J. R. Micr. Soc. (2) iv. pp. 395 & 396.]
9. DYBOWSKI, W. Mittheilung über einen neuen Fundort des Schwammes *Lubomirskia baicalensis*. SB. Ges. Dorp. 1884, pp. 44 & 45.
10. —. Ein Beitrag zur Kenntniss des Süßwasserschwammes *Dosilia stepanowii*. Zool. Anz. vii. pp. 476-480. [Ann. N. H. (5) xiv. pp. 249-254.]

11. [DYBOWSKI, W.] Some remarks upon the variability in form of *Lubomirskia baicalensis*, and upon the distribution of the Baikal Sponges in general. Ann. N. H. (5) xiv. pp. 29-34, pl. ii. [Trans. from Bull. Petersb.]
12. —. Notes on the South Russian *Spongillide*. Trans. in Ann. N. H. (5) xiv. pp. 58-63.
13. —. Monographie der *Spongilla sibirica*, Dyb. SB. Ges. Dorp. vii. pp. 64-75 & 137-139.
14. FRISTEDT, K. Om en fossil *Spongia*. Cefv. Ak. Förh. xli. pp. 55-60, pl. xii.
15. GOETTE, A. Ueber die Entwicklung der Spongillen. Zool. Anz. vii. pp. 676-679 & 703-705.
16. HALL, J. On the Fossil Reticulate Sponges constituting the Family *Dictyospongidae*. Rep. Brit. Ass. liv. pp. 725 & 726.
17. HARMER, S. F. On a Method for the Silver Staining of Marine Objects. MT. z Stat. Neap. 1884 pp. 445 & 446.
18. HINDE, G. J. Catalogue of the Fossil Sponges in the Geological Department of the British Museum (Nat. Hist.), with descriptions of new and little-known species. London: 4to, 248 pp., 38 pls.
19. —. On Fossil Calcisponges from the Well-boring at Richmond. J. G. Soc. xl. pp. 778-783.
20. —. On the Structure and Affinities of the Family of the Receptaculites, including therein the genera *Ischadites*, Murch. (= *Tetragonis*, Eichw.), *Sphæræospongia*, Pengelly, *Acanthochonia*, g. n., and *Receptaculites*, Deifr. T. c. pp. 795-849, pls. xxxvi. & xxxvii.
21. HUGHES, T. McK. On the so-called *Spongia paradoxica*, S. Woodw., from the Red and White Chalk of Hunstanton. J. G. Soc. xl. pp. 273-279. [Abstr. Ann. N. H. (5) xiii. p. 298.]
22. KIESOW, J. Ueber silurische und devonische Geschiebe Westpreussens. Schr. Ges. Danz. (2) xvi. pp. 205-300, pls. ii.-iv.
23. LENDENFELD, R. v. Das System der *Monactinellide*. Zool. Anz. vii. pp. 201-206. [Trans. in Ann. N. H. (5) xiv. pp. 65-69; abstr. J. R. Micr. Soc. (2) iv. pp. 394 & 395.]
24. —. Notes on the Fibres of certain Australian *Hircinide*. T. c. pp. 641 & 642.
25. —. On the Occurrence of Flesh-spicules in Sponges. T. c. pp. 493 & 494.
26. —. The Digestion of Sponges: effected by Ectoderm or Endoderm? P. Linn. Soc. N. S. W. ix. pp. 434-438.
27. —. A Monograph of the Australian Sponges. i. Introduction; t. c. pp. 121-154. ii. Morphology and Physiology of the Sponges; t. c. pp. 310-344. iii. Preliminary Description and Classification of the Australian *Calcispongiae*; t. c. pp. 1083-1150, pls. lix.-lxvii.

28. MARSHALL, W. New Siliceous Sponges from the Congo. *Jen. Z. Nat.* xvi. p. 553. [Abstr. *J. R. Micr. Soc.* (2) iv. pp. 66 & 67; cf. *Zool. Rec.* xx. *Spong.* p. 2.]
29. —. *Agilardiella radiata*, einer neue Tetractinelliden-form mit radiärem Bau. *Abh. Ak. Berl.* 1884, 15 pp., 1 pl.
30. —. Vorläufige Bemerkungen über die Fortpflanzungsverhältnisse von *Spongilla lacustris*. *SB. Ges. Leipzig*, 1884, pp. 22-29.
31. —. Some Preliminary Remarks on the Gemmules of the Fresh-water Sponges. *Ann. N. H.* (5) xiii. pp. 163-171. [A translation of No. 30.]
32. MILLS, H. Serial Arrangement of Birotulate Spicules in Strobilasts of American Sponges. *Am. Micr. J.* v. pp. 41 & 42.
33. POLÉJAEFF, N. Report on the Scientific Results of the Voyage of H.M.S. 'Challenger.' Report on the *Calcarea*. 1884, 4to, 76 pp., 9 pls.
34. POTTS, E. Some Modifications Observed in the Form of Sponge-Spicules. *P. Ac. Philad.* 1884, p. 184.
35. —. On the Wide Distribution of some American Sponges. *T. c.* pp. 215-217.
36. —. Fresh-water Sponges as improbable causes of the pollution of river water. *T. c.* pp. 28-30. [Abstr. *Ann. N. H.* (5) xiii. pp. 486 & 487.]
37. PRIEST, B. W. On the *Hexactinellidae*. *J. Quek. Club* (2) ii. pp. 8-16, pls. ii. & iii.
38. RIDLEY, S. O. *Spongida* of the Voyage of the 'Alert.' *Rep. Zool. Coll. Alert*, pp. 366-482 & 582-630, pls. xxxix.-xliii., liii., & liv.
39. —. Notes on Sponges, with Description of a New Species (*Cladachalina diffusa*). *Ann. N. H.* (5) xiv. pp. 183-187.
40. RINGUEBERG, E. N. S. New Fossils from the Four Groups of the Niagara Period of Western New York. *P. Ac. Philad.* 1884, pp. 144-151, pls. ii. & iii.
41. SOLGER, B. Vital Manifestations of Sponges. *Abstr. Am. Nat.* xviii. pp. 635 & 636 [cf. *Zool. Rec.* xx. *Spong.* p. 2].
42. SOLLAS, W. J. On the Development of *Halisarca lobularis* (O. S.). *Q. J. Micr. Sci.* (n.s.) xxiv. pp. 603-621, pl. xxxvii. [Abstr. *J. R. Micr. Soc.* (2) v. pp. 73 & 74; *Arch. Z. expér.* (2) iii. Notes, pp. xxvi. & xxvii.]
43. THOULET, J. Siliceous Spicules of Sponges. *Abstr. Am. J. Sci.* (3) xxviii. p. 76; *J. R. Micr. Soc.* (2) iv. p. 757 [cf. *Zool. Rec.* xx. *Spong.* p. 5].
44. VEJDovsky, F. Fresh-water Sponges of Bohemia. *Abstr. J. R. Micr. Soc.* (2) iv. p. 282.

4 Spong.

SPONGIÆ.

45. [VEJDOVSKY, F.] Contributions to the Knowledge of the Fresh-water Sponges, with remarks by H. J. Carter. Trans. Ann. N. H. (5) xiii. pp. 96-102, pl. [Abstr. J. R. Micr. Soc. (2) iv. pp. 242 & 243.]
46. —. Bemerkungen über einige Süßwasserschwämme. SB. böhm. Ges. 1884, pp. 55-60, 1 pl.
47. VOSMAER, G. C. J. *Porifera*. Pts. III.-VI. Bronn's Klassen und Ordnungen, pp. 65-176, pls. iii. & vii.-xviii.
48. —. Ueber seine und Poléjaeff's Untersuchungen über Kalkschwämme. Biol. Centralbl. iv. pp. 241-244.
49. —. New Genus of Sponges (*Velinea*). Abstr. J. R. Micr. Soc. (2) iv. p. 243 [cf. Zool. Rec. xx. *Spong.* p. 3].
50. —. Studies on Sponges. II.-IV. II. On the supposed difference between *Leucandra crambessa*, H., and *aspera* (O. S.), H., with an attempt to explain it. III. On Hæckel's entogastric septa. IV. On the relation between certain *Monactinellidæ* and *Ceraospongiæ*. MT. z. Stat. Neap. v. pp. 483-493, pls. xxviii. & xxix.; Zool. Anz. vii. p. 211.
51. WALLER, J. G. On a newly-discovered British Sponge. J. Quek. Club (2) i. pp. 216-224, pl. viii.
Hymeraphia forceps.
52. WHITE, C. A. The Enemies and Parasites of the Oyster, past and present. Science, iii. p. 618.
53. ZITTEL, K. A. Ueber *Astylospongiæ* und *Anomocladina*. JB. Mineral. 1884, ii. pp. 75-80. [Trans. Ann. N. H. (5) xiv. pp. 271-276.]

GENERAL.

VOSMAER (47) concludes the historical part of his valuable review, describes methods of investigation and preservation, and commences the morphological part of the work.

LENDENFELD (27) gives a general account of the history, morphology, and physiology of Sponges.

ANATOMY AND HISTOLOGY.

CARTER (2) contributes observations on the structure of the statoblast in several species of fresh-water Sponges; and (3) describes the structure of *Grantia spinispiculum*, Crtr. The same author describes (5) the skeletal structure of *Leucosolenia hilleri*, sp. n., and compares it with that of fossil Calcisponges. On statoblasts, see also HYATT, Science, iv. p. 450.

DÜDERLEIN (8) gives an account of the general structure and skeletal characters of new species of Lithistids.

HARMER (17) states that by means of a new method, which he describes, Vosmaer has been able to trace the outlines of the epithelial cells in *Chondrosia*, *Thenea*, and other Sponges.

HINDE (18, 19, 20) describes the structure of numerous fossil Sponges.

LENDENFELD (25) records the occurrence of flesh spicules in *Aplysillida* and a Sponge otherwise like *Cucospongia*; and (23) in a genuine *Hircinia*.

MARSHALL (29) describes the structure of *Agilardiella radiata* (g. & sp. nn.), a monozoic tetractinellid Sponge with a radiate structure, the antimera four, or a multiple of four, in number, surrounding a central gastric cavity.

MILLS (32) describes, with woodcut, serial arrangement of birotulate spicules in fresh-water Sponges.

VEJDovsky (45) describes the structure of the statoblasts of *Ephydatia amphizona* (Vej.) and *Trachospongilla erinaceus*, Ehr.

ZITTEL (53) abandons the views that he had previously expressed as to the structure of the skeleton in the *Anomocladina*, and now states that it consists of monaxial rods, which, anastomosing at each end, give rise to the nodes.

ONTOGENY.

CARTER (5) states that *Leucosolenia* (*Spongia*) *coriacea*, Mont., commences existence as a simple erect sac, open at the upper end; tubular buds proceeding from it, increase in size, and anastomose together till the reticulate structure of the adult is produced.

DÖDERLEIN (8) describes the origin of the skeletal corpuscles of certain Lithistid Sponges.

GOETTE (15) gives an account of the development of *Spongilla lacustris*. The two-layered embryo is a sterrogastrula, in which subsequently an endodermal cavity arises; the ectoderm disappears with attachment of the larva, and the future sponge proceeds therefore entirely from the endoderm; this differentiates early into a peripheral layer, which replaces the ectoderm as an epidermis, and a compact inner mass, which gives rise to all the other tissues; in the inner mass originate the in- and ex-current cavities and the ciliated chambers, separate from each other, with no common plan, so that the distinction of an enteroderm (darmblatt) from a mesoderm is not possible. *Spongillæ*, and generally all Sponges, arose from a two-layered ancestor, but develop at present their whole organization from a single germinal layer. The development of the gemmules is also traced.

SOLLAS (42) traces the development of *Halisarca lobularis*, Sdt., within the body of the parent sponge. Segmentation is more or less irregular; a solid morula results, no segmentation cavity being formed. The cells of the morula collect in strings and heaps, and a blastula is thus formed; the blastula stage is slurred over, and an abnormal gastrula stage follows; both walls of the gastrula consist of flagellated cells, and subsequently undergo complicated foldings.

PHYLOGENY.

DÖDERLEIN (8) derives the Tetracladine Lithistids from the *Stelletidae*, Sdt., the *Rhizomorina* are modifications of the *Tetracladina*, and gave rise to the *Megamorina* and *Anomocladina*.

LENDENFELD (23) derives the *Monaxonidæ* from the *Cerospongiæ* as follows:—The *Cerospongiæ* give rise to the *Chalarchidæ* (*Chalinida* with delicate acerate spicules in the axis of the horny fibres), ~~these are the~~ *Chalcænidæ* (*Chalinida* with dense masses of large acerates within the fibres). From the *Chalcænidæ* three families originate, as lateral branches, the *Echispidæ* (nearly equivalent to Carter's *Echinonemata*) and *Renieridæ*; in the direct line, *Clathridæ* (*Chalinida* with acute spicules in the fibres), and from this finally the *Suberitidæ* arise. The *Myxospongiæ* give rise to a series of forms, of which the *Spongida* are the middle members; from the sides of this series twigs proceed, bearing the *Aplysinæ* and *Hirciniæ* at the ends. The *Gummineæ* branch off between the *Myxospongiæ* and *Spongidæ*.

SOLLAS (42) traces hypothetically a possible course of development of Sponges from the Choanoflagellate *Infusoria*.

VOSMAER (50) adduces arguments to prove that Lendenfeld's views of the relationship of *Cerospongiæ* and *Monaxonidæ* should be reversed, the latter being more probably the ancestors of the former than their descendants.

PHYSIOLOGY.

CARTER (4) thinks it not improbable that *Uruguaya coralloides* propagates by ova alone, though statoblasts may possibly be formed as well.

LENDENFELD (24) suggests that the horny fibres of certain *Hircinidæ* may be formed, as a result of irritation, about symbiotic oscillarians which infest these Sponges. He denies that the pigment cells which give colour to some horny fibres (e.g., those of *Ianthella*), are concerned in the formation of the fibre. The same author (26) discusses further the question as to which tissues are concerned in the ingestion of nourishment by Sponges, and points out that if Marshall's observations on the ontogeny of *Reniera filigrana* be correct, we must regard the endoderm as the absorptive layer, though at the same time he admits the truth of Poléjaeff's suggestion that nourishment may be absorbed by any part of the free surface of the sponge.

POTTS (34) states that spicules of fresh-water Sponges increase in size and solidity as the Sponges are traced from high altitudes towards the sea level.

CLASSIFICATION.

CARTER (1) defines the following genera, which he had previously named:—*Coscinoderma* (*C. lunuginosum*), *Ectyopsis* (*E. ramosa*), *Phycopsis* (*P. hirsuta*), *Ptilocaulis* (*P. gracilis*), *Leucophleus* (*L. müssalis*), and emends Gray's definition of *Ectyon*.

DÜDERLEIN (8) shows that the differences in form of the dermal discs in *Discodermia* cannot be relied on for purposes of classification, since from the same specimen he obtained forms which Zittel had regarded as distinctive of different genera.

HINDE (20) shows that the fossil group of *Receptaculitidae* is to be classed among the *Hexactinellidae*.

VON LENDENFELD (27) supports the view that the Sponges are *Cœlenterata*, and proposes the following classification:—

- Order I. *Calcispongiæ*. Fams. *Asconidae*, *Syconidae*, *Leuconidae*.
 „ II. *Myxospongiæ*. Fams. *Halisarcidae*, **Chondrosidae*.
 „ III. *Ceraospongiæ*. Fams. **Spongelidae*, **Spongidae*, **Aplysillidae*,
 **Aplysinidae*, **Hircinidae*.
 „ IV. *Monacticeræ*. Fams. **Chalarchidae*, **Chalcenidae*, †*Clathride*,
 Echispidae.
 „ V. *Hyalospongiæ*. Fams. *Plakinidae*, *Hexactinellidae*, *Lithistidae*.
 „ VI. *Monactihyalæ*. Fams. *Renieridae*, *Suberitidae*.

The families marked * are each divided into two subfamilies, characterized by the presence or the absence of flesh spicules; that marked † furnishes as well a third subfamily, characterized by the presence of foreign bodies.

MARSHALL (29) argues in favour of the *Cœlenterate* affinities of the Sponges, and considers that the radiate structure of *Agilardiella* and other Sponges supports his views.

POLEJAEFF (33) regards the Sponges as a subtype of the *Cœlenterata*; and divides the *Calcarea* into two orders—*Homocœla*, with the single family *Asconidae*, and *Heterocœla*, with the families *Syconidae*, *Leuconidae*, and *Trichonidae*. He restores the historical continuity of the genera interrupted by Hæckel. The *Asconidae* contains the single genus *Leucosolenia*, Bk. The genera of the *Syconidae* are *Sycon*, Risso, having an articulated tubar skeleton, radial tubes free, or if united, preserving their individuality; *Grantia*, Fleming, with articulated tubar skeleton, radial tubes with individuality suppressed, owing to formation of a cortex possessing triradiate spicules; *Ute*, Sdt., with a strongly-developed cortex, supported by large acerate spicules in several layers; *Heteropogma*, n., articulated tubar skeleton, strongly-developed cortex, with tri- and quadri-radiate spicules of different sizes in the parenchyma; *Amphoriscus* (H.), tubar skeleton not articulated, cortex with tri- or quadri-radiate spicules, or both; *Anaximilla*, n., no special tubar skeleton, spicules.

The *Leuconidae* embrace the following:—*Leucilla* (H.), flagellated chambers elongated cylindrical, a certain regularity in the disposition of the spicules of the parenchyma; *Leuconia*, Bk., flagellated chambers more or less spherical, spicules of the parenchyma irregularly distributed; *Leucetta* (H.), skeleton of strongly-developed cortex quite different from that of the parenchyma; *Pericharax*, n., distinct subdermal cavities. The *Teichonidae* are *Teichonella*, Crtr., valvate or foliate, vents numerous, confined to the margin or general on one side of the lamina only (Crtr.); *Eilharzia*, n., calyciform, poriferous surface with tri-radiate and minute acerate spicules, osculiferous surface with large acerates.

RIDLEY (38) defines the following new genera:—*Acerochalina*, *Toxochalina* (a *Chalinid* containing tricurvate flesh spicules), *Gelliodes*, *Iotrochota*; and adopts Gray's genera, *Gellius*, *Crella*, and *Erylus*.

SOLLAS (42) regards the Sponges as forming a phylum (*Parazoa*)

distinct from the *Metazoa*. He suggests that the *Chondrosiadae* should be removed from the *Myxospongiae*.

LENDENFELD (23) regards flesh spicules as of no great value for purposes of classification; they are of cœnogenetic origin. A tendency to their formation occurs in all members of Lendenfeld's series, beginning with *Halisarca* and ending in *Renieridae* and *Suberitidae*. They are quite independent of other skeletal structures. When a fibrous skeleton becomes well developed the flesh spicules remain small and insignificant; if, on the other hand, a fibrous skeleton is absent, the flesh spicules may attain considerable dimensions, and give rise to a coherent structure.

NEW SPECIES AND SYNONYMY.

CALCISPONGIÆ.

CARTER (3) states that *Grantia ciliata* var. *spinispiculum*, Crtr., is identical with *Sycandra raphanus* (H.); and considers that *Sycandra ciliata* and *S. coronata* (H.) are identical species, such differences as may exist being due to accidental circumstances; and (5) describes *Leucosolenia lacunosa*, Bk., var. *hilleri*, n., from Ramsgate.

HINDE (19) describes *Neobolia micula*, *Peronella nana*, *Blastinia cristata*, *B. pygmæa*, *Oculospongia minuta*, fossil Calcisponges from the Jurassic beds beneath Richmond, Surrey.

POLEJAEFF (33) describes the following new species:—*Leucosolenia challengerii*, *Grantia tuberosa*, *Heteropegma nodus gordii*, *Ute argentea*, *Amphoriscus poculum*, *A. elongatus*, *A. flamma*, *Anamixilla torresi*, *Leucilla connexiva*, *L. uter*, *Leuconia multiformis*, *L. typica*, *L. rudifera*, *L. levis*, *L. crucifera*, *L. ovata*, *L. loricata*, *L. dura*, *Pericharax carteri*, *Leucetta imperfecta*, *L. vera*, *L. hœckeliana*, *Eilhardia schulzei*. For localities, see under Geographical Distribution.

RIDLEY (38) describes *Leucetta bathybia* (H.) vars. *australiensis* and *mascarenica*, and *Leucortis anguinea*.

VOSMAER (50) shows that *Leucandra crambessa* (H.) and *L. aspera* (H.) are varietal forms of the same species.

MONAXONIDE.

CARTER (2) states, in correction of a previous statement, that *Trochospongilla erinaceus*, Ehr., is not identical with *Meyenia leidii*, Bk.; and (4) that *Dosilia stepanowii*, Dyb., S. Russia, is closely allied to *Heteromeyenia repens*, Potts, Pennsylvania, *Meyenia plumosa*, Crtr., Bombay, and *Meyenia baileyi*, Bk.

DYBOWSKI (12) describes *Dosilia stepanowii*, sp. n., from S. Russia.

RIDLEY (38) describes *Chalina monilata*, *Cladochalina nuda* and var. *abruptispicula*, *C. subarmigera*, *Toxochalina* (g. n.) *robusta*, *T. murata*, *Pellina muricata*, *P. aliformis*, *P. eusiphonia*, *Protoschmidtia hispidula*, *Schmidtia variabilis*, *Rhizochalina fistulosa*, Bk., var. *infradensata*, *R. spathulifera*, *R. canalis*, *Gellius couchii*, Bk., var. *ceratina*, *Amphilectus*

tibiellifer, *A. hispidulus*, *Myxilla arborescens*, *Crella schmidtii*, *Iotrochota* (g. n.) *baculifera*, *Esperia pellucida*, *Phoriospongia fibrosa*, *Ophlitispongia australiensis*, *Clathria aculeata*, *C. coppingeri*, *C. reinwardtii* (Vosm.) var. *subcylindrica* and *palmata*, *Rhaphidophlus arborescens*, *R. procerus*, *Acarnus ternatus*, *Echinodictyum glomeratum*, sp. & var. *subglobosum*, *Raspailia bifurcata*, *R. australiensis*, *R. clathrata*, *Leucophlaeus fenestratus*, *Hymeniacion agminata*, *Spirastrella vagabunda*, *S. congenera*, *S. decumbens*, all from Australia; *Reniera camerata*, Amirante and Seychelles; *R. cribriformis*, Seychelles; *Rhizochalina pellucida*, Providence Island; *Desmacidon rimosa*, Mozambique; *Iotrochota baculifera* and *Esperia gelatinosa*, from Providence Island; *Clathria decumbens*, *C. meandrina*, *Acarnus ternatus*, from Amirante Islands; *Echinonema gracilis*, *Axinella proliferans*, *Leucophlaeus proteus*, from Providence Island; *Spirastrella transitoria*, Amirante Island; *S. punctulata*, Mozambique. He (39) states that *Spongia mesenterina*, Lmk., = *Echinonema vasiplicata*, Crtr., = *Echinodictyum mesenterina*, Rdl.; *Hymeniacion pulvinata*, Bk., = *Spirastrella pulvinata*, Rdl.; and *Arabescula parasitica*, Crtr., = *Corallistes parasitica*, Rdl.; and describes *Cladochalina diffusa*, sp. n.

VELDOVSKY (45) proposes to raise the variety *Ephydatia mülleri*, forma B, to the rank of a distinct species, *E. amphizona*; and (46) states that *Spongilla siberica* is identical with *S. fragilis*, Leidy.

CEROSPONGIA.

RIDLEY (38) describes *Euspongia officinalis*, Lin., var. *cavernosa*, *Hippospongia detersa*, *Stelospongia excavatus*, *S. implexus*, *Dysidea digitifera*, *D. semicanalis*, *Psammopemma densum* (Marshall) var. *subfibrosa*, from Australia; *Phyllospongia madagascarensis*, Hyatt, var. *supraoculata*, from Providence Island and Amirante Island; *Dysidea gumminea*, from Mozambique and Providence Island; *Oligoceras conulosum*, from Glorioso Island; *Aplysina pallasii*, from Providence and Amirante Islands.

TETRACTINELLIDA.

MARSHALL (29) describes *Agilardiella* (g. n.) *radiata*, sp. n., from N. New Zealand, in 45 fath.

RIDLEY (38) describes *Stelletta purpurea*, sp. & var. *retroflexa*, *S. clavosa*, *Stellettinopsis carteri*, *Tethyopsis dissimilis*, from Australia; *Erylus cylindrigerus* and *S. purpurea* var. *parvistella*, Providence Island.

LITHISTIDÆ.

DÖDERLEIN (8) describes *Seliscotho chonelloides* and *Discodermia japonica*, *D. calyx*, *D. vermicularis*, from Japan, from 30 to over 100 fath.

DISTRIBUTION.

Europe. DYBOWSKI (10), *Spongilla friabilis*, Leidy, var. *segregata*, *S. lacustris*, and *Meyenia fluviatilis*, from S. Russia; (12), *Dosilia stepanowii*, sp. n., from S. Russia.

WALLER (51). *Hymeraphia forceps*, from Torquay.

N. America. CARTER (6) mentions the following Sponges as occurring

at Florida :—*Aplysina cauliformis*, Crtr., *Paraspongia*?, *Hircinia tubulosa*, Crtr., *Spongelia avara*, Sdt., *Dysidea tenerima*, Crtr., *Chalina occulata*, Bk., *Tuba sororia*, Duch. & Mich., *Reniera digitata*, Sdt., *Higginsia coralloides*, Higgins, *Axinella polypoides*, Sdt., *Halichondria panicea*, Bk., *H. incrustans*, Crtr., *H. sanguinea*, Bk., *Raphyrus griffithsii*, Bk., *Tethya lyncurium*, Bk., *Ascultis lamarchii*, Hæckel.

POTTS (35). *Spongilla fragilis*, Leidy, = *S. lordii*, Bk., occurs over the whole of the North American continent, and at Charkow, in Russia. *Spongilla lacustris*, *S. fragilis*, *S. iglooiformis*, *Meyenia fluviatilis*, *M. everetti*, Mills, *Heteromeyenia argyrosperma*, *H. ryderi*, *Tubella pennsylvanica*, are found in lakes of Nova Scotia.

West Indies. *Acarnus carteri*, RIDLEY (38), p. 454.

S. America. POLÉJAEFF (33) describes *Amphoriscus flamma*, sp. n., from shallow water, Bahia.

Islands of the Atlantic Ocean. POLÉJAEFF (33) describes *Sycon arcticum* (Hæck.), *Heteropegma nodusgordii*, sp. n., *Leucilla ater*, sp. n., *Leuconia multiformis*, sp. n., *L. typica*, sp. n., *L. rudifera*, sp. n., *L. dura*, sp. n., from Bermudas, all in 32 fath.; *Leucosolenia blanca* (Mik. MacLay), and *Leuconia crucifera*, sp. n., from the Azores in 450 fath.; and *Grantia tuberosa*, sp. n., from the Cape Verde Islands.

Islands of the Western Indian Ocean. RIDLEY (38) describes *Cacospongia cavernosa*, Sdt., *Hippospongia intestinalis*, Lmk., var., *H. sinuosa*, Pallas, and vars. *mauritanica*, *decidua*, Hyatt, *Phyllospongia papyracea*, Esper, *P. madagascarensis*, Hyatt, and var. *supraoculata*, n., *Carteri spongia otahitica*, Esper, *C. mantelli*, Bk., *C. pennatula*, Lmk., *Hircinia fusca*, Crtr., *H. byssoides*, Lmk., *Dysidea conica*, Bk., *D. gumminea*, sp. n., *Oligoceras conulosum*, sp. n., *Aplysina fusca*, Crtr., *A. pallasi*, sp. n., *Ianthella flabelliformis*, Pallas, *Chondrilla mixta*, *Chalina elongata*, *Acerochalina finitima* var., *Reniera indistincta*, Bk., *R. rosea*, Bk., *R. camerata*, sp. n., *R. cribriformis*, sp. n., *Pellina* sp., *Tedania digitata*, Sdt., *Rhizochalina pellucida*, sp. n., *Desmacida rimosa*, sp. n., *Iotrochota purpurea*, *I. baculifera*, sp. n., *Esperia gelatinosa*, sp. n., *Clathria frondifera*, Bk., *C. decumbens*, sp. n., *C. mæandrina*, sp. n., *Acarnus ternatus*, sp. n., *Echinonema gracilis*, sp. n., *Axinella spiculifera*, Lmk., *A. proliferans*, sp. n., *Leucophaeus protus*, sp. n., *L. fenestratus*, sp. n., *Suberites* sp., *Vioa schmidtii*, Ridley, *Spirastrella transitoria*, *S. punctulata*, sp. n., *Tethya cliftoni*, Bk., *Tetilla dactyloidea*, Crtr., *Erylus cylindrigerus*, sp. n., *Stelletta acervus*, Bk.

Australia. POLÉJAEFF (33) describes *Leucosolenia poterium* (?) (Hæck.), *L. lamarchii* (H.), *L. challengerii*, sp. n., *Heteropegma nodusgordii*, sp. n., *Ute argentea*, sp. n., *Amphoriscus poculum*, sp. n., *Anamixilla torresi*, sp. n., *Leuconia loricata*, sp. n., *L. dura*, sp. n., *Leucetta imperfecta*, sp. n., *L. hæckeliana*, sp. n., and *Eilnardia schulzei*, sp. n., from the East Coast of Australia.

RIDLEY (38) describes *Cacospongia mollior*, Sdt., *Euspongia foliacea* (Esper?), *E. officinalis*, L., var. *carernosa*, n., *E. septosa* (Lmk.?), *Hippospongia derasa*, sp. n., *Stelospongia excavatus*, sp. n., *S. implexus*, sp. n., *S. intertextus*, Hyatt, *Carteri spongia otahitica*, Esper, *C. lamellosa*, Esper, *C. fissurata*, Lmk., *Hircinia horrens*, Selenka, *Dysidea favosa*,

Marshall, *D. fusca* (Crtr.?), *D. digitifera*, sp. n., *D. semicanalis*, sp. n., *Psammopemma densum*, Marshall, and var. n. *subfibrosa*, *Aplysina membranosa*, Pallas, *Lanthella flabelliformis*, Pallas, *Chalina monilata*, sp. n., *Cladochalina armigera*, Duch. & Mich., *C. nuda*, sp. n., and var. n. *abruptispicula*, *C. subarmigera*, sp. n., *C. pergamentacea*, Ridley, *Acervochalina* (g. n.) *finitima*, Sdt., *Tuba bullata* (Lmk.?), *T. confederata* (Lmk.?), *Siphonochalina tubulosa*, Esper, var., *Tubulodigitus communis*, Crtr., *Toxochalina folioides*, Bk., *T. robusta*, sp. n., *T. murata*, sp. n., *Pachychalina lobata* (Esper?), *P. macroductyla*, Lmk., *Reniera indistincta*, Bwk., var., *R. scyphonoides*, Lmk., *R. ferula*, Bk., *R. acqueductus*, Sdt., *R. testudinaria*, Lmk., *Pellina muricata*, sp. n., *P. aliformis*, sp. n., *P. eusiphonia*, sp. n., *Protoschmidtia hispidula*, sp. n., *Schmidtia variabilis*, sp. n., *Amorphina megaloraphis*, Crtr., *Tedania digitata*, Sdt., *Rhizochalina fistulosa*, Bk., and var. n. *infradensata*, *R. singaporensis*, Crtr., var., *R. spathulifera* sp. n., *R. canalis*, sp. n., *Gellius couchi*, Bk., and var. n. *ceratina*, *G. varius*, Bk., *G. fibulatus*, Sdt., *G. cymiformis*, Esper, *Gelliodes fibulata* (Crtr.?), *Amphilectus tibiellifer*, sp. n., *A. hispidulus*, sp. n., *Myxilla arborescens*, sp. n., *Crella schmidtii*, sp. n., *Iotrochota purpurea*, Bk., *I. baculifera*, sp. n., *Esperia parasitis*, Bk., *E. pellucida*, sp. n., *E. obscura* (Crtr.?), *Phoriospongia fibrosa*, sp. n., *Ophlitispongia australiensis*, sp. n., *Clathria aculeata*, sp. n., *C. tuberosa*, Bk., *C. coppingeri*, sp. n., *C. reinwardti*, Vosmaer, and varr. nn. *subcylindrica* and *palmata*, *C. frondifera*, Bk., *Rhaphidophlus arborescens*, sp. n., *R. procerus*, sp. n., *Acarnus ternatus*, sp. n., *Echinodictyum bilamellatum*, Lmk., *E. costiferum* (Lmk.?), *E. glomeratum*, sp. n., and var. *subglobosum*, *E. cancellatum* (Lmk.?), *Raspailia bifurcata*, sp. n., *R. australiensis*, sp. n., *R. clathrata*, sp. n., *Azinella echidnea* (Lmk.?), *Acanthella carduus* (Lmk.?), *Leucophrax fenestratus*, sp. n., and var., *Suberites carnosus*, Johnston, *S. epiphytum*, Lmk., *Hymeniacion caruncula*, Bk., *H. agminata*, sp. n., *Spirastrella vagabunda*, sp. n., *S. congenera*, sp. n., *S. decumbens*, sp. n., *Stelletta purpurea*, sp. n., and var. *retroflexa*, *S. clavosa*, sp. n., *Stelletinopsis carteri*, sp. n., *Tethyopsis dissimilis*, sp. n., *Geodia globostellifera*, Crtr., *Placospongia carinata*, Bk., *Leucetta primigenia*, H., and var. *microrrhaphis*, H., *Leucaltis bathybia*, H., and var. n. *australiensis*, *Leuconia saccharata*, H., *S. purpurea*, sp. n., and var. n. *parvistella*, *Leucetta primigenia*, H., and var. *megalirrhaphis*, H., *L. bathybia*, H., var. n. *mascarensis*, *Leucortis anguinea*, sp. n., *Leuconia echinata*, Schuffner.

New Zealand. MARSHALL (29) describes *Agilardiella radiata*, g. & sp. nn., from New Zealand, in 45 fath.

Japan. DÜDERLEIN (8) describes *Seliscothon chonelloides*, sp. n., *Discodermia japonica*, sp. n., *D. calyx*, sp. n., *D. vermicularis*, sp. n., from the Bay of Sagami, Is. Enoshima.

Philippine Islands. POLEJAEFF (33) describes *Sycon raphanus*, O. S., *S. artium*, H., *Leucilla connexiva*, sp. n., *L. uter*, sp. n., *Leuconia multiformis*, sp. n., from Philippine Islands, in 95-100 fath.

Singapore. RIDLEY (39), *Cladochalina diffusa*, sp. n.

PROTOZOA.

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 Daday describes the only known non-marine Polythalamian Foraminifer (*Entzia tetrastomella*). It has resemblances to many different families of *Foraminifera*, and "unites the imperforate with the perforate *Polythalamia*." It occurred in a salt pool near Déva, in Transsylvania. The test is chitinous, with adherent small plates of quartz; sixteen chambers in a flat dextral spiral.
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 A species or variety intermediate between *Peridinium tabulatum* and *P. apiculatum*.
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Entz monographs the *Infusoria* of the Bay of Naples, and draws these conclusions:—(1) The marine Infusorial fauna differs considerably from that of fresh-water, and has only a few species in common with it. (2) A considerable number of marine *Infusoria*, which, as a whole, belong to the littoral (and brackish-water) fauna, also appear in salt lakes. (3) The Infusorial fauna of different seas is not considerably different, as in fresh-waters.

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The skeletal evolution of Reticular Rhizopods is discussed, and the following 9 tribes are distinguished:—Naked, half-naked, slimy, pasty, globigerinaceous, spicular, arenaceous, porcellaneous, and vitreous. Each one of these stages, which lead up from the just-described *Bathypopsis* to the last of the vitreous, is a group of organisms clothed in a particular manner and peculiar to it.

29. FOULKE, S. G. Some Phenomena in the Life-History of *Clathrulina elegans*. P. Ac. Philad. 1884, pp. 17-19. [Cf. Ann. N. H. (5) xiv. pp. 268-270.]
30. —. A new species of *Trachelius*. P. Ac. Philad. pp. 51 & 52.
31. —. The Reproduction of *Clathrulina elegans*. Science, iii. p. 435.
32. —. Quelques détails de l'histoire naturelle du *Clathrulina elegans*. J. Microgr. viii. pp. 616-619.
33. FRANZENAU, A. *Heterolepa*, eine neue Gattung aus der Ordnung der Foraminiferen. Term. füzetek, viii. pp. 214-217, pl.
34. GIARD, J. Sur les Infusoires du genre *Freya*. Bull. Sci. Nord (2) xv. [1883] pp. 264 & 265.
35. GOURRET, P. Sur les Péridiniens du Golfe de Marseille. Ann. Mus. Marseille, i. 1883, 114 pp., 4 pls.
36. GRASSI, L. Una parola al Dr. Blochmann. Zool. Anz. vii. p. 175. [Un mot au Dr. Blochmann. J. Microgr. viii. pp. 219 & 220.]
37. GRENFELL, J. G. On some new *Infusoria* from Bristol. J. Micr. Nat. Sci. iii. pp. 133-138, pl. xv.
38. GRUBER, A. Ueber Kern und Kerntheilung bei den Protozoen. Z. wiss. Zool. xi. pp. 121-153. (Cf. Biol. Centralbl. iv. pp. 233-235.)
39. —. Studien über Amöben. Z. wiss. Zool. xli. pp. 186-225, pls. xiii.-xv.
40. —. Die Protozoen des Hafens von Genua. 67 pp., 5 pls. Nova Acta Ac. L.-C. Nat. cur. xlvi. No. 4 (and published separately, Halle).

41. [GRUBER, A.] R. Hertwig, Ueber die Kerntheilung bei *Actinosphaerium eichhornii*. Biol. Centralbl. iv. pp. 203-205.
42. HÆCKEL, E. Ueber die Geometrie der Radiolarien. SB. Jen. Ges. xvii. pp. 104-108.
43. —. On the Orders of the *Radiolaria*. Nature, xxix. pp. 274-276 & 296-299. [Translation; cf. Zool. Rec. xx. Prot. p. 6.]
44. HENNEGUY, L. F. Note sur un Infusoire flagellé ectoparasite de la Truite. Arch. Z. expér. (2) ii. pp. 403-411, pl. xxi.
[*Bodo necator*; cf. preliminary notice, Zool. Rec. xx. Prot. p. 8.]
45. —. Note sur un nouvel Infusoire cilié (*Ascobius lentus*). T. c. pp. 412-415, pl. xxi.
46. *HERRICK, C. L. [See Science, iv. p. 73.]
47. HERTWIG, R. Ueber die Kerntheilung bei *Actinosphaerium eichhornii*. Jen. Z. Nat. xvii. pp. 490-517, pls. ix. & x.
48. —. *Erythropsis agilis*. Eine neue Protozoe. Morph. JB. x. pp. 204-213, pl. vi.
49. HILGENDORF, F. Bemerkungen über die sogenannte Krebspest, insbesondere über *Psorospermium haeckelii*, sp. n. SB. nat. Fr. 1883, pp. 179-183.
50. IMHOF, O. E. Sur les Flagellés en colonies du genre *Dinobryon* comme membres de la faune pélagique des lacs. Arch. Sci. nat. xii. pp. 442 & 443.
51. —. Weiter Mittheilung über die pelagische Fauna der Süßwasserbecken. Zool. Anz. vii. pp. 321-327.
Enumerating *Protozoa* from some of the Italian lakes. In Ann. N. H. (5) xiii. [1884], there is a notice of Imhof's paper on the same subject last year [cf. Zool. Rec. xx. Prot. pp. 1 & 8].
52. JICKEL, C. F. Ueber die Copulation von *Diffugia globulosa*, Duj. Zool. Anz. vii. pp. 449-451. [Cf. Ann. N. H. (5) xiv. pp. 297 & 298.]
53. —. Ueber die Kernverhältnisse der Infusorien. Zool. Anz. vii. pp. 468-473 & 491-497.
54. J. W. Notes on *Stentor caruleus*. Am. Micr. J. v. pp. 50 & 51.
Stentor stated to capture rotifers and *Paramecia* by projecting portions of its protoplasm; only small food particles taken through mouth.
55. *KELICOTT, D. S. P. Am. Micr. Soc. vii. 1884, pp. 110-124, 1 pl.
[Cf. J. R. Micr. Soc. (2) v. p. 470.]
Giving the chief results of his study during the previous year of American *Infusoria*, enumerating the species he had identified.
56. *—. The Microscope, iv. pp. 284-353, 2 figs. [Cf. J. R. Micr. Soc. (2) v. p. 78.]
57. KENT, W. SAVILLE. Notes on the Infusorial Parasites of the Tasmanian White Ant. P. R. Soc. Tasm. 1884-85, pp. 270-273.
1884. [VOL. XXI.]

58. KERBERT, C. *Chromatophagus parasiticus*, g. & sp. nn. Ein Beitrag zur Parasitenlehre. Tijdschr. Nederl. Dierk. Ver., v. pp. 44-57, 1 pl. [Cf. J. R. Micr. Soc. (2) v. (1885) p. 81.]
59. KLEBS, G. Ein kleiner Beitrag zur Kenntniss der Peridineen. Bot. Z. xlii. [1884] pp. 721-733 & 737-745, 1 pl. [Cf. J. R. Micr. Soc. (2) v. pp. 468 & 469.]
- Klebs has discovered that the supposed horizontal girdle of cilia in the *Peridina*, &c., has no existence, but is an optical illusion, caused by the vibration of a flagellum which lies in the equatorial groove; hence the name *Dinoflagellata* must replace that of *Cilioflagellata* [Bütschli has since corroborated this in 1885]. The author objects to Stein splitting the *Peridinie* into a number of new genera, and still maintains that they are algæ.
60. KUNSTLER, J. Sur une forme aberrante du phylum *Sporozoa*. C.R. xviii. pp. 633 & 634.
61. —. Sur un Rhizopode. C.R. xcix. pp. 337 & 338. [Cf. J. R. Micr. Soc. (2) v. p. 82.]
62. —. *Nyctotherus duboisii*. J. Microgr. viii. pp. 86-92, fig. 19.
63. —. *Trichomonas vaginalis*, Don. T. c. pp. 317-331, pls. v. & vi.
64. —. *Bacterioidomonas sporifera* (g. & sp. nn.). T. c. pp. 376-380, pl. vii.
- *65. —. Ann. Sci. Nat. Bord. ii. (1883) pp. 45-54, 2 pls. [Cf. J. R. Micr. Soc. (2) iv. p. 905.]
66. —, & PITRES, A. Sur une Psorospermie trouvée dans une humeur pleurétique. J. Microgr. viii. pp. 469-474 & 520-526, pls. xii. & xiii.
67. LEWIS, T. R. Further Observations on Flagellated Organisms in the Blood of Animals. Q. J. Micr. Sci. (n.s.) xxiv. pp. 357-369.
- Figures are given of flagellated organisms from the blood of a puppy and of a rat. No explanation of their presence is given.
68. LOCKWOOD, S. *Astasia hamatodes*. J. Microgr. viii. pp. 220 & 221.
- This Infusorian not only undergoes amœboid movements and changes of form, but can even change its colour from red to emerald-green or turquoise-blue.
69. MAUPAS, E. Contribution à l'étude morphologique et anatomique des Infusoires ciliés (conclusion). Arch. Z. expér. (2) i. pp. 433-664.
70. —. Réponse à M. Balbiani [see 4]. Op. cit. ii. Notes iv.-vi.
71. McMURRICH, J. PLAYFAIR. A New Species of Infusorian. Am. Nat. xviii. pp. 830-832, fig. 1. [Cf. P. Canad. Inst. i. pt. iv.]
72. NUSSBAUM, M. Ueber spontane und künstliche Zellteilung. SB. Ges. Bonn, 1884, pp. 259-263. [Cf. J. R. Micr. Soc. (2) v. p. 472.]
73. NÜSSLIN, O. Ueber ein neues Protozoon. Tagebl. 56 Vers. D. Naturf. Aerzte Freiburg, p. 16, 1883. [*Zonomyxa violacea*, g. & sp. nn.]

74. [NÜSSLIN, O.] Ueber einige neue Urthiere aus dem Herrenwieser See im badischen Schwarzwalde. Z. wiss. Zool. xl. pp. 697-724, 2 pls.
75. OXLEY, F. On *Protospongia pedicellata*, a new compound Infusorian. J. R. Micr. Soc. (2) iv. pp. 530-532, figs. 85 & 86.
 Oxley records the capture, from a pond near Snaresbrook, Essex, of a second species of Saville Kent's remarkable genus, *Protospongia*. The description is unfortunately too imperfect to have any morphological value.
76. PARKER, A. S. Reproduction in *Amphileptus fasciola*. Ann. N. H. (5) xiii. pp. 416 & 417. [Cf. Zool. Rec. xx. Prot. p. 12.]
77. PARONA, C. Materiali per la Fauna dell' isola di Sardegna. x. I Protisti della Sardegna (conclusion). Boll. scient. vi. pp. 53-59.
78. POTTS, E. An Unfamiliar Rhizopod [*Raphidiophrys pallida*]. P. Ac. Philad. 1884, pp. 292 & 293.
79. POUCHET, G. Sur un Péridinien parasite. C.R. xcviii. pp. 1345 & 1346.
80. REES, J. VAN. Protozoën der Oosterschelde.—Protozoaires de l'Escault der l'Est. Tijdschr. Nederl. Dierk. Ver. Suppl. D, pp. 592-673, 1 pl. (36 spp., 1 sp. n.)
81. REGNARD, P. Recherches expérimentales sur l'influence des très-hautes pressions sur les organismes vivants. C.R. xcviii. pp. 745-747.
82. ROBOZ, Z. v. Rhizopodenstudien. Math. Nat. Ber. Ung. i. p. 265. [Cf. Zool. Rec. xx. Prot. p. 7.]
83. RYDER, J. A. The Protozoa and Protophytes considered as the Primary or Indirect Source of the Food of Fishes (2nd edition, revised). U. S. Fish. Comm. Rep. ix. (for 1881) 1884, pp. 755-770.
84. —. On the Chlorophylloid Granules of *Vorticella*. P. U. S. Nat. Mus. vii. pp. 9-12, with fig. [Cf. J. R. Micr. Soc. (2) v. pp. 78 & 79.]
85. SALLITT, J. A. On the Chlorophyll Corpuscles of some Infusoria. Q. J. Micr. Sci. (n.s.) xxiv. pp. 165-170, pls. xiii. & xiv.
86. SCHLUMBERGER, C. Sur le *Biloculina depressa*, D'Orb., au point de vue du dimorphisme des Foraminifères. Paris: 1884, 8 pp. (Ass. fr. avanc. Sc. Congrès, Rouen, 1883.)
87. —. Sur l'*Orbulina universa*, D'Orb. C.R. xcviii. pp. 1002-1004, figs. 1 & 2. [Cf. Ann. N. H. (5) xiv. pp. 69-71.]
 Schlumberger confirms Carpenter's conclusions concerning the distinctness of *Orbulina* from *Globigerina*. The presence of the internal chambers in certain *Orbulinae* which simulate a *Globigerina* is merely another example of dimorphism in the *Foraminifera* [cf. Munier-Chalmas & Schlumberger, also Shacko, Zool. Rec. xx. Prot. p. 7.]
88. SCHNEIDER, A. Sur le développement du *Stylorhynchus longicollis*. Arch. Z. expér. (2) ii. pp. 1-36, pl. i.

89. [SCHNEIDER, A.] *Ophryocystus buetschlii*, Sporozoaire d'un nouveau type. *T. c.* pp. 111-125, pl. vi. [Transl. in *Ann. N. H.* (5) xiv. pp. 301-313, pl. x.]

Schneider maintains that this species institutes the type of a new order [subclass, Lankester, *Encyc. Brit.* 1885], the *Amœbosporidia*.

90. SCHWARZ, F. Der einfluss der Schwerkraft auf die Bewegungsrichtung von *Chlamydomonas* und *Euglena*. *Ber. Bot. Ges.* ii. pp. 51-72.
91. STOKES, A. C. Notes on some apparently undescribed *Infusoria* from putrid waters. *Am. Nat.* xviii. pp. 133-140.
92. —. Notes on a New Infusorian. *T. c.* pp. 659-666, figs. 1-4.
93. —. A New Infusorian belonging to the Genus *Vorticella*. *T. c.* pp. 829 & 830, figs. 1 & 2.
94. —. Notices of some New Parasitic *Infusoria*. *T. c.* p. 1081.
95. —. Notes upon some apparently undescribed forms of Fresh-water *Infusoria*. *Am. J. Sci.* (3) xxviii. pp. 38-49, figs. 1-10.
96. —. Change of the Generic Name of *Solenotus* [into *Notoselenus*]. *T. c.* p. 158.
97. —. A New Infusorian belonging to the Genus *Pyxicola*. *T. c.* p. 24, fig. 5.
98. —. Has *Salpingoeca urceolata*, S. K., a fresh-water habitat? *T. c.* pp. 25 & 26, figs. 6 & 7.
- Supporting former statement [*cf.* *Zool. Rec.* xx. *Prot.* p. 11]; also fig. of deformed *S. acuminata*.
99. —. New Members of the Infusorial Order *Choano-Flagellata*, S. K. II. *Am. Micr. J.* v. pp. 43-45, fig. 12.
100. —. Notices of New Fresh-water *Infusoria*. *T. c.* pp. 121-125, figs. 1-9.
101. —. *Phialonema cyclostomum*, Stein. *T. c.* p. 142, fig. 25.
- First American locality.
102. —. Notices of New Fresh-water *Infusoria*, II. *T. c.* pp. 226-230, figs. 1-10.
103. —. Notes sur un Infusoire nouveau. *J. Microgr.* viii. pp. 423-427, figs. 50 & 51, & pp. 466-469.
104. —. Notes sur quelques Parasites Nouveaux. *T. c.* pp. 566-572, figs. 54-56.
105. —. The Reproduction of *Clathrulina elegans*. *Science*, iv. p. 303.
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107. TRINCHESE, S. Materiali per la storia naturale delle Monere del Golfo di Napoli. *Mem. Acc. Bologn.* (4) v. 1883, pp. 495-502, pl. [Also published separately, Bologna, 4to, 26 pp., 1 pl.]

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PALEONTOLOGY.

110. CROSSKEY, H. W. Note on the *Ostracoda* and *Foraminifera* of the Shelly Patches at Bridlington Quay. J. G. Soc. xl. pp. 325-327.
111. DAWSON, J. W. On the Geological Relations and Mode of Preservation of *Eozoon canadense*. Rep. Brit. Ass. liii. p. 494.
112. DEECKE, W. Die Foraminiferenfauna der Zone des *Stephanoceras humphriesianum* im Unter-Elsass. Strassburg, R. Schultz & Co.: 68 pp., 2 pls. Abh. geol. Spec. v. Elsass-Lothringen, iv.
113. DUNIKOWSKI, E. v. Ueber einige neue Nummulitenfunde in dem ostgalizischen Karpathen. Verh. geol. Reichsanst. xvii. pp. 128-130.
114. GARDNER, J. S. Chalk and the Origin and Distribution of Deep-Sea Deposits. Nature, xxx. pp. 192, 193, 264, & 265.
115. GOES, A. Om *Fusulina cylindrica*, Fischer, från Spetsbergen. Cefv. Ak. Förh. 1883, pp. 29-35, with fig.
116. HARPE, P. DE LA. Étude sur les Nummulites de la Suisse (conclusion). Abh. schw. pal. Ges. x. pp. 141-180, 5 pls.
117. HEDDLE, M. F. The Geognosy and Mineralogy of Scotland. Mineral. Mag. v. pp. 271-324, figs. 1-11.
- Supports the view of the inorganic origin of the Scotch and Canadian Eozoon.
118. HEILPRIN, A. Notes on some New *Foraminifera* from the Nummulitic Formation of Florida. P. Ac. Philad. 1884, pp. 321 & 322, 2 figs.
119. A. HYATT, in a paper read before the American Association for Advanc. Sci. (Science, iv. p. 340), regards the anomalous fossil *Beatrixea* as a Foraminifer.
120. JONES, T. R. Notes on the *Foraminifera* and *Ostracoda* from the Deep Boring at Richmond. J. G. Soc. xl. pp. 765-777, pl. xxxiv.
121. LEIDY, J. *Foraminifera* in the Drift of Minnesota. P. Ac. Philad. 1884, pp. 22 & 23. And from the Boulder-Drift of Chicago (Science, iii. p. 295). Also B. W. Thomas (l. c. p. 215).
122. RÜST, —. Ueber fossile Radiolarien aus Schichten des Jura. Jen. Z. Nat. xviii. pp. 40-44.
- A preliminary paper. 234 spp., 121 spp. nn.; *Podocapsa*, *Salpingocapsa*, gg. nn.

123. [*Rüst, —]. Ueber das Vorkommen von Radiolarien Resten in kryptokrystallinischen Quarzen aus dem Jura und in Koproolithen aus dem Lias. Verh. Vers. Freiburg, 1883.
124. SCHLUMBERGER, —, & MUNIER-CHALMAS, —. Sur les Miliolidées trématophorées. Bull. Soc. géol. (3) xii. pp. 629 & 630.
125. SEGUENZA, G. Studi geologici e paleontologici sul cretaceo medio dell' Italia meridionale. Atti Acc. Rom. (3) xii. pp. 65-214.

GENERAL ANATOMY AND PHYSIOLOGY.

The parts in continuation of Bütschli's monograph (16) contain the following sections:—Sexual reproduction of the *Volvocineæ*, p. 787. Formation of the resting-stage without the occurrence of copulation, p. 794. Classification of Flagellates, p. 799: (1) historical; (2) relations of the Flagellates to the *Protozoa* already described and to the unicellular vegetable organisms, p. 803; (3) detailed account of the classification adopted, giving diagnoses of all the genera, but omitting the species. Nearly every genus is figured, and, as a matter of fact, a large number of the species; the plates were published in 1883 [cf. Zool. Rec. xx. Prot. p. 1]. Physiological Biology—(A) phenomena of movement, p. 846; (B) behaviour towards warmth and light, p. 859.

The whole question of the structure and behaviour of the nuclei amongst the *Protozoa* is treated very fully by Gruber (38). In the *Protista*, the nuclear substance is probably evenly distributed in fine granules; granules of nuclear matter occur in *Trichosphaerium sieboldi* (*Pachymyxa hystrix*) and *Pleurophrys gennensis*: in *Amœba proteus*, these are found together with a distinct nucleus. After conjugation and division, certain *Protozoa* are filled with nuclear particles. A vesicular nucleus occurs generally in the *Rhizopoda*, *Heliozoa*, *Sporozoa*, all true *Flagellata*, and in some *Radiolaria* and *Ciliata*. In these the chromatin may be diffused, in which case the nucleus simply divides, or there may be a central nucleolus which divides first, the nucleus dividing between the two nucleoli. The various kinds of nuclei of the above-mentioned groups are treated in detail. The nucleus of the *Cilio-flagellata* leads on to the *Ciliata*, in which group, and in the *Suctorina*, a "massive" nucleus is found, which is usually furnished with a membrane, and in which during division the chromatin is arranged in longitudinal filaments. In certain *Ciliata* (*Trachelocerca*, *Chœnia*), the nucleus, as such, may be absent, being diffused throughout the body as fine chromatin-particles, which only become visible on the application of reagents: in closely allied forms the ordinary nucleus is present. The division of the nuclei is much simpler in *Protozoa* than in *Metazoa*; but Gruber believes that the protozoon or direct method does occur amongst the *Metazoa* [cf. Blochmann, Morph. JB. 1885].

Nussbaum (72) divided *Oxytricha* into two halves, either longitudinally or transversely, and found that, although some protoplasm, or even a nucleus, might be lost, perfectly normal individuals resulted with their four nuclei. Separated portions without a nucleus failed to develop, so

that a nucleus seems to be essential to the retention of the regenerative power of a cell.

Stokes (105) has a paper on the remarkable Helizoon *Clathrulina elegans*. Six reproductive methods are known : (1) self-division, (2) instantaneous throwing off of a small mass of sarcode, (3) the formation and liberation of minute germs, (4) the quadruple subdivision of the body into uni-flagellate organisms, (5) the separation from the body of a free-swimming *Heteromita*-like zooid for the dissemination of the species, and (6) a similar body-fission whose resulting biflagellate organism is anchored to the parent-capsule for the formation of a colony. The first and last are described in this paper. Amongst others, Miss Foulke (29) describes the fourth method. After two hours, the uni-flagellate germ fixes itself by its flagellum and develops into a small stalked form ; and she has a note (31) upon the above paper of Stokes'.

Worcester (108) has observed that after conjugation *Stentor coerules* becomes more or less amœboid, from which fragments were detached which developed into fresh individuals. The formation of internal embryos and fission were also noted.

R. Hertwig (47) describes the nuclear division in *Actinosphaerium eichhornii* ; and Gruber (41) has a note on this paper. The process in this Heliozoon appears to be intermediate between the simple nuclear division of most *Protozoa* and the well-known process in animal and vegetable cells.

Jickeli (53) thinks it probable that the nucleus is concerned in the nutrition of *Infusoria*. "Polar bodies" were observed to be emitted in four cases, in one case during the act of encysting, in another after conjugation. The behaviour of the nucleus and paranucleus (nucleolus) during fission and conjugation is described. An interchange of the division-products of the paranucleus, but not of the nucleus, occurs during conjugation in *Paramœcium*.

Bergonzini (6) has notes upon the study of *Vorticelle*, movements of *Amœbe*, and a reproductive phenomenon in *Stylonychia*.

A. G. Bourne has translated Engelmann's valuable chapter on the Physiology of Protoplasmic Movement, in Q. J. Micr. Sci. (n.s.) xxiv. pp. 370-418, from Hermann's Handwörterb. der Physiologie. The allusions to the physiology of the protoplasm of various *Protozoa* are so numerous that it is impossible to do justice to this paper here. The scheme of the treatise is as follows :—I. Introduction. II. Physical and chemical properties of contractile protoplasm. III. The spontaneous movements of protoplasm : (1) movements of naked protoplasm ; (2) movements of protoplasm bounded by firm integuments. IV. General conditions of spontaneous protoplasmic movement : (1) temperature ; (2) imbibition of water ; (3) oxygen ; (4) other chemical conditions—poisons. V. Behaviour of protoplasm towards artificial stimulation : (1) electrical stimuli ; (2) thermal stimuli ; (3) light stimuli ; (4) mechanical stimuli ; (5) chemical stimuli. VI. Theoretical conclusions : (1) formation of spheres by naked protoplasm on excitation ; (2) origin of processes ; (3) rotation of the protoplasm within the cell walls ; (4) stoppage of spontaneous movements by artificial stimuli. Bourne has a note (p. 378) on the excretory function of the contractile vacuole.

Various details relating to the structure of the protoplasm and nuclei of certain *Protozoa* will be found in *La Biologie Cellulaire* ; J. B. Carnoy. J. van In & Cie., Lierre : 1884.

Sallit (85) investigates the chlorophyll corpuscles of the following *Infusoria* :—*Paramecium bursaria*, *Stentor polymorphus*, *Vaginicola grandis*, *Vorticella campanula* ?, *Phacus triqueter*, *P. longicaudis*, *P. glabra*, *Euglena acus*, *E. oxyuris*, and *E. viridis* ; and finds they consist, as in *Spongilla* and *Hydra*, of a colourless ball of clear protoplasm imperfectly invested by a layer of chlorophyll-containing protoplasm—"chloroplasm." In *Vorticella chlorostigma*, the chlorophyll is diffused through the endoplasm. See also Ryder (84), who finds that the chlorophyll in *V. chlorostigma* is not diffuse, but in granules in the ectoplasm (!) ; he also enters into the question generally [cf. J. R. Mic. Soc. (2) v. pp. 78 & 79].

Although Zopf (109) deals with the *Myxomycetes* in the widest sense of the term, his observations on their anatomy and physiology have a direct bearing on the lowest *Protozoa*.

GENERAL BIOLOGY.

The evolution of the *Metazoa* from colonial *Protozoa* is discussed by A. Hyatt in "The Larval Theory of the Origin of Cellular Tissue," *Am. Nat.* xviii. pp. 460-464 (cf. *Science*, iii. p. 337) ; and by O. Bütschli in "Gedanken über die morphologische Bedeutung der sogenannten Richtungskörpchen," *Biol. Centralbl.* iv. pp. 5-12.

Möbius, K. Das Sterben der einzelligen und der vielzelligen Tiere vergleichend betrachtet. *Biol. Centralbl.* iv. pp. 389-392.

W. H. Dallinger, in a lecture before the British Association (at Montreal), described the life-history and fixed the thermal death-point of several Monads, &c. ; "Times," Sept. 2 & 4, and *Nature*, xxx. pp. 619-622 & 645-648 [cf. J. R. Mic. Soc. (2) iv. pp. 721-725].

Certes (19) describes the results of experiments with high pressure upon the vitality of marine and fresh-water micro-organisms. *Paramecium colpoda* and *Vorticella* showed latent life after 48 hours in 300 atmospheres ; the marine *Infusoria*, *Euplotes charon*, *E. patella*, and *Pleuronema marina* retained the power of motion ; but *Holosticha flava* and *Actinophrys* died. [Cf. also Regnard (81).]

Certes returns (20) to the problem of the effect of high pressures on the vitality of micro-organisms, and states that he prepared two similar tubes—A with a reservoir of air, and B without any air—and subjected both to a pressure of 350 atmospheres for 21 days ; in both microbes alone survived, except in A, in which there were also some lively *Chlamydococcus pluvialis*.

Schwarz (90) experiments upon the action of gravity upon the direction of the movements in certain Flagellates.

The relation of *Foraminifera* to deep-sea deposits is alluded to by J. Murray & A. Renard, in their paper on the nomenclature, origin, and

distribution of deep-sea deposits; *Nature*, xxx. pp. 84-88, 114-117, & 132-135.

Herdman, P. *Liverp. Soc.* xxxviii. p. xlv., found that the phosphorescence of the sea at Loch Fyne, in the autumn of 1883, was due to *Peridinium tripos*; not a single *Noctiluca* was found.

Ryder (83) writes upon the *Protozoa* as a source of food for fishes; and in "An Account of Experiments in Oyster Culture," &c. (U. S. Fish. Comm. Rep. [for 1882] 1884, pp. 763-778), alludes to Protozoan food and parasites of the oyster and its ova. *Actinophrys sol* is stated to feed on dead oyster eggs, sp. gr. of water 1.007 to 1.0095 [confirmed in a letter to Recorder].

E. H. Wagstaff, *Am. Micr. J.* v. pp. 144 & 145, gives a list of *Protozoa*, &c., collected in a pond near Birmingham, to prove that life is abundant during winter. B. Moss, *Knowledge*, v. p. 423, fig., states that he found a living *Amaba*, with numerous other organisms, in a hailstone; and Leidy, *Am. J. Sci.* (3) xxviii. p. 477, found swarms of *Infusoria* in dead *Lumbriculus* in ice.

Deecke (22) describes an unnamed *Protamæba* which produced perforations in the bottom of a water-tank made of tinned copper. When the material which fills the furrows is removed, the pure metallic surface of the copper is brought to view, as if acted on by an acid. It would appear that the copper [and tin] is dissolved in minute quantities; then, by the interchange of the acid with the carbonic acid of the lime salt contained in the water, forms a soluble organic lime compound and carbonate of copper, the latter being deposited in the furrows, some of which comparatively indifferent material is naturally accidentally taken in by the *Protamæba*. The author suggests that other cases hitherto ascribed to galvanic action, or that of air and water, may be related to micro-organic life.

METHODS, &C.

Bergonzoni (6) details his methods of the colouration of living *Infusoria*.

Brass, *Z. wiss. Mikr.* i. 1884, pp. 39-51, gives several valuable methods of killing, preserving, and examining *Protozoa* [*cf.* *Am. Nat.* xviii. pp. 650 & 651, and *J. R. Micr. Soc.* (2) iv. pp. 633 & 634].

CATTANEO, G. Fixation, Coloration, et Conservation des Infusoires. *Arch. Ital. Biol.* iii. pp. 345-353. [*Cf.* *Zool. Rec.* xx. *Prot.* p. 5.]

L. Errera recommends, *Bull. Soc. Belge Micr.* (*cf.* *Am. Micr. J.* v. pp. 208-210) colouring (with Chinese ink) the surrounding medium instead of the living object.

Fol, *Arch. Z. expér.* ii. p. ix., has improved his perchloride of iron process.

McMurrich (71) recommends corrosive sublimate for killing *Infusoria* when a temporary preparation is alone required.

GENERA AND SPECIES.

PROTISTA.

Deecke (22) [see General Biology, p. 12].

Trinchese (107) describes and figures from Naples *Protamæba minima*, Trin., *Protogenes roseus*, Trin., *Aletium piriforme*, Trin.

Protamæba vorax, sp. n., Gruber (40).

Zopf (109) describes several new organisms of the *Mycetozoa* or *Myxomycetes* (in a general sense of the term). These constitute such a complete series up to forms with a complicated capillitium that most botanists now accept them as plants. Such forms as *Vampyrella*, *Myxastrum*, *Protomonas*, *Protomyxa*, and their allies, are unreservedly adopted by Zopf, whose work is another useful reminder of the uncertainty regarding the true nature of many *Amæba*-like organisms. K. Wilhelm, Biol. Centralbl. iv. pp. 353-356, abstracts E. Stahl's researches (Bot. Z. Nos. 10-12) on the biology of the *Myxomycetes*. De Bary has also recently written on the group; "Vergleichende Morphologie und Biologie de Pilze, Mycetozoen und Bacterien," with 198 woodcuts, Leipzig, 1884 [cf. Biol. Centralbl. iv. pp. 578 & 579, and Ann. N. H. (5) xiv. pp. 363-366]. See also Göbel, Flora, No. 23, 1884.

RHIZOPODA.

PROTOPLASTA.

Gruber (39) describes the following from fresh water:—*Amæba prima*, *A. secunda*, *A. tertia*, *A. quarta*, *A. quinta*, *A. binucleata*, *A. lucida*, *A. granulosa*, *A. spumosa*; and from a marine aquarium, *A. crystalligera*, *A. fluida*, all spp. nn., besides other known forms.

Kunstler has a note (61) on a very remarkable Rhizopod, which he does not name or classify.

Zonomyxa violacea, g. & sp. nn., Black Forest, Nüsslin (73, 74).

Diffugia obliqua, sp. n., Tarr, (106) Albany, N. York, fresh-water (2 figs.).

FORAMINIFERA.

Gruber (40) describes as new: *Lieberkuehnia diffuens*, *Pleurophrys genensis*, *Craterina*, g. n., for *C. mollis*, *Gromia dubia*, *G. lugenoides*, *Umulina*, g. n., for *U. diffugiæformis*, and *Ovulina urnula*, *Lagena siphoniata*, *elegans*.

Balkwill and Millet (5) describe *Lagena faba*, sp. n., and several varieties of *Lagena*, from Galway.

Brady (13), in his Report on the 'Challenger' Foraminifera, states his reasons for giving up the various sub-orders, and divides the order Foraminifera at once into 10 families, viz.:—*Gromidae*, *Miliolidae*, *Astrorhizidae*, *Lituolidæ*, *Textularidae*, *Chilostomellidae*, *Lagenidae*, *Globigerinidae*, *Rotalidae*, *Nummulinidae*. Tables giving the distribution of Foraminifera are appended. The following are new:—*Nubecularia*

inflata, sp. n., p. 135, *Spiroloculina arenaria*, sp. n., p. 153, *S. tenuiseptata*, sp. n., p. 153, *S. acutimargo*, sp. n., p. 154, *S. (?) convexiuscula*, sp. n., p. 155, *Miliolina amygdaloides*, sp. n., p. 163, *M. terquemiana*, sp. n., p. 166, *M. bertheliniana*, sp. n., p. 166, *M. macilenta*, sp. n., p. 161, *M. bucculenta*, sp. n., p. 170, *M. scrobiculata*, sp. n., p. 173, *M. crassatina*, sp. n., p. 180, *Articulina lineata*, sp. n., p. 183, *A. funalis*, sp. n., p. 185, *Vertebralina insignis*, sp. n., p. 187, *Ophthalmidium tumidulum*, sp. n., p. 189, *Planispirina sigmoidea*, sp. n., p. 197, *Cornuspira lacunosa*, sp. n., p. 202, *Pelosina cylindrica*, sp. n., p. 236, *Technitella raphanus*, sp. n., p. 247, *Saccamina socialis*, sp. n., p. 255, *Hyperamina friabilis*, sp. n., p. 258, *H. subnodosa*, sp. n., p. 259, *Aschemonella ramuliformis*, sp. n., p. 273, *Rhizammina indivisa*, sp. n., p. 277, *Reophax pilulifera*, sp. n., p. 292, *R. cylindrica*, sp. n., p. 299, *Haplophragmium calcareum*, sp. n., p. 302, *H. emaciatum*, sp. n., p. 305, *H. anceps*, sp. n., p. 313, *Trochammina globata*, sp. n., p. 341, *Textularia inconspicua*, sp. n., p. 357, *T. jugosa*, sp. n., p. 358, *T. crispata*, sp. n., p. 359, *T. transversaria*, sp. n., p. 359, *T. luculenta*, sp. n., p. 364, *Gaudryina scabra*, sp. n., p. 381, *Verneuilina variabilis*, sp. n., p. 385, *V. propinqua*, sp. n., p. 387, *Bulinina subornata*, sp. n., p. 402, *B. rostrata*, sp. n., p. 408, *Virgulina pauciloculata*, sp. n., p. 414, *V. texturata*, sp. n., p. 415, *V. subdepressa*, sp. n., p. 416, *Bolivina nitida*, sp. n., p. 420, *Lagena truncata*, sp. n., p. 457, *L. spiralis*, sp. n., p. 468, *L. seminuda*, sp. n., p. 472, *L. quadrangularis*, sp. n., p. 483, *L. clathrata*, sp. n., p. 485, *L. alveolata*, sp. n., p. 487, *Nodosaria catenulata*, sp. n., p. 515, *Frondicularia robusta*, sp. n., p. 523, *Vaginulina patens*, sp. n., p. 533, *Cristellaria latifrons*, sp. n., p. 544, *Poly-morphina sequenzana*, sp. n., p. 567, *Uvigerina schwoegeri*, sp. n., p. 575, *Sagrina (?) tessellata*, sp. n., p. 585, *S. annulata*, sp. n., p. 586, *S. limbata*, sp. n., p. 586, *Spirillina decorata*, sp. n., p. 633, *Patellina campaniformis*, sp. n., p. 634, *Cymbalopora tabelliformis*, sp. n., p. 637, *Discorbina concinna*, sp. n., p. 646, *D. patelliformis*, sp. n., p. 647, *D. pulvinata*, sp. n., p. 650, *D. rarensis*, sp. n., p. 651, *D. ventricosa*, sp. n., p. 654, *Planorbulina acervalis*, sp. n., p. 657, *Truncatulina tenuimargo*, sp. n., p. 662, *T. tenera*, sp. n., p. 665, *T. humilis*, sp. n., p. 665, *T. tumidula*, sp. n., p. 666, *Anomalina foreolata*, sp. n., p. 674, *Pulvinulina dispansa*, sp. n., p. 687, *P. exigua*, sp. n., p. 698, *Rotalia papillosa*, sp. n., p. 708, *R. venusta*, sp. n., p. 708, *R. clathrata*, sp. n., p. 709.

Lingulinopsis carlofortensis, sp. n., Sardinia, Bornemann (12).

Entzia tetrastomella, g. & sp. nn., salt pool, Transsylvania, Daday (21).

Bathyopsis, g. n. [no specific name], Atlantic, deep water; Folin (28)

Franzenau (33) describes 4 spp. nn. of *Heterolepa*, g. n.

Amphitrema stenostoma, sp. n., Black Forest, Nüsslin (75).

RADIOLARIA.

Acanthometra hemicompressa, sp. n., Car (17).

HELIOZOA.

Myxastrum liguricum, *Rhaphidiophrys arenosa*, and *Acanthocystis italica*, spp. nn.; Gruber (40).

INFUSORIA.

FLAGELLATA.

Blanc (10), in his paper on the variability and reproduction of *Ceratium hirundinella*, states that *C. reticulatum*, Imhof [cf. Zool. Rec. xx. Prot. p. 1], is one phase in the cycle of variability of the former species.

Bütschli (16) describes the following new genera:—*Astasiopsis*, p. 823, ? *Astasiodes*, p. 823, ? *Tetratoma*, p. 838, ? *Polynastix*, p. 843.

Entz (26); *Codonocladium corymbosum*, sp. n., *Menoidium astasia*, sp. n., Hungarian salt-pools.

Ceratium allieri, p. 56, *C. bergi*, p. 55, *C. bicornis*, p. 57, *C. carriense*, p. 38, *C. depressum*, p. 41, *C. dilatatum*, spp. nn., p. 46, var. *parvum*, p. 46 (*C. furca* v. *contorta*, Pouchet, = *dilatatum*, Gourr.), *C. furca* v. *mediterraneum*, p. 49, v. *medium*, p. 50, v. *singulare*, p. 51, v. *tertium*, p. 51, *C. fusus* v. *concauum*, p. 53, v. *extensum*, p. 52, vv. nn., *C. gibberum*, sp. n., p. 34, v. *contorta*, p. 35, v. *sinistrum*, p. 36, *C. globatum*, p. 47, *C. globosum*, p. 40, *C. gravidum*, p. 58, *C. hexacanthum*, p. 36, *C. limulus*, p. 33, *C. longirostrum*, p. 55, *C. minus*, p. 39, *C. obliquum*, p. 42, *C. obtusum*, p. 44, *C. parvum*, p. 39, *C. pellucidum*, p. 54, *C. pentagonum*, spp. nn., p. 45, v. *rectum*, v. n., p. 45, *C. procerum*, sp. n., p. 43, v. *divergens*, v. n., p. 44, *C. quinquecorne*, p. 60, *C. rostellum*, spp. nn., p. 59, *C. tripos* v. *arcuatum*, p. 25, v. *contrarium*, p. 32 (*C. tripos* v. *dispar*, Pouchet, = *C. gibberum* v. *sinistrum*, Gourr., p. 36), v. *inequale*, p. 30, v. *inflexum*, p. 29 (*C. tripos*, v. *limulus*, Pouchet, = *C. limulus*, Gourr., p. 33), v. *massiliense*, p. 27 (*C. tripos* v. *megaceros*, Pouch., = *C. gibberum*, Gourr., p. 34), v. *typicum*, p. 31, vv. nn., *Dinophysis allieri*, p. 76, *D. inequalis*, p. 80, *D. jourdani*, p. 79, *D. tripos*, p. 80, *Gymnodinium ovatum*, spp. nn., p. 88, *Parrocelia oralis*, g. & sp. nn., p. 81 (*Peridinium fusus*, Ehrbg., = ? *Ceratium pellucidum*, Gourr., p. 54), *Postprorocentrum ovale*, g. & sp. nn., p. 83, *P. maximum*, p. 84, *Protoceratium densum*, spp. nn., p. 85, *Roulea spinifera*, g. & sp. nn., p. 86, *R. obliqua*, sp. n., p. 87. All are figured. Gulf of Marseilles. Gourret (35).

Dinobryon calyculatum, sp. n., Imhof (51).

Bacterioidomonas sporifera, g. & sp. nn., from cæcum of *Cavia*; Kunstler (64).

Proteromonas regnardi, g. & sp. nn., from intestines of *Cistula europæa*, Sch.; Kunstler (65).

Nyctotherus duboisii, sp. n., from intestine of a larva of a beetle (*Oryctes nasicornis*); Kunstler (62).

Pouchet (79) describes a Peridinian parasitic on *Appendicularia*.

Ileteromita putrina, sp. n., p. 133, figs. 1 & 2; Stokes (91).

Ecechlyga acuminata, g. & sp. nn., parasitic in rectum of toad (*Scaphiopus holbrookii*); Stokes (94, 104).

Notosolenus aptocaptus, g. & sp. n., *N. orbicularis*, sp. n., Stokes (95, 96).

Codosiga florea, sp. n., Stokes (99).

Petalomonas distoma, sp. n., p. 125 & fig.; Stokes (100).

CILIATA.

Anoplophrya circulans, sp. n., Balbiani, (3) from blood of *Asellus*.

Gruber (40) describes as new: *Lagynus sulcatus*, *Spirostomum lanceolatum*, *Spirostomina*, g. n., for *S. lucida*, *Strombidium oculatum*, *S. minimum*, *Trichodina asterisci*, *Lienophora asterisci*, *Litonotus pictus*, *L. filum*, *Orthodon*, g. n., for *O. hamatus*, *Hypocoma*, g. n., for *H. parasitica*, *Styloma*, g. n., for *S. oviformis*.

Stephanopogon colpoda, g. & sp. nn., p. 326, pl. xx. figs. 16-19 (Fam. Colepina), (Fam. Chlamydodonta) *Nassula hesperidea*, sp. n., p. 331, pls. xxi. fig. 1-5, *Rhabdodon falcatus*, g. & sp. nn., p. 338, pl. xxi. figs. 9-13, *Onychodactylus acrobates*, g. & sp. nn., p. 350, pl. xxii. figs. 6-13 (type of a new fam.), *Holosticha flavoviridis*, n. n., p. 359, *Uroleptus zignis*, p. 373, pl. xxiii. figs. 14-16, *Urostyla gracilis*, p. 376, pl. xxiii. figs. 8-12, *U. concha*, p. 379, pl. xxiii. fig. 13, *Stichotricha inquilinus*, p. 380, pl. xxiv. fig. 22, *Strombidium tintinnodes*, p. 387, pl. xxiii. figs. 24-27, *Tintinnus ganymedes*, p. 409, pl. xxiv. figs. 17 & 18, *T. anadyomene*, p. 409, pl. xxiv. fig. 19, *Codonella armiger*, p. 412, pl. xxiv. fig. 23, *C. perforata*, p. 415, pl. xxiv. figs. 12-14, *Zoothamnium mucedo*, spp. nn., p. 418, pl. xxv. figs. 6-13 & 15, Gulf of Naples, Entz (25).

Trachelius leidy, sp. n., Foulke, (30) pp. 51 & 52 [withdrawn in J. New York Micr. Soc. 1885].

Grenfell (37) describes and figures as new from Bristol, fresh-water, *Zoothamnium kentii*, *Pyxicola annulata*, spp. nn. [Leidy is stated to have found and described this form in America just before, and gave it the same name, therefore the priority belongs to him], *Platycolp bicolor*, *P. aurita*, spp. nn.

Ascobius lentus, g. & sp. nn., Henneguy (45), fresh-water, Montpellier.

Herrick (46) describes *Spirochona gemmipara*, Ehr., *Ophridium problematicum*, sp. n. (allied to *O. versatile*, Ehr.), *Phragelliorhynchus nasutus*, g. & sp. nn. (no figs.).

Hertwig (48) describes a remarkable Protozoon (*Erythropsis agilis*, g. & sp. nn.) [cf. J. R. Micr. Soc. (2) v. p. 77], with a contractile tail-like process and a pigmented ocellus and a large nucleus; it is possibly allied to the *Vorticellidae*. [C. Vogt, Zool. Anz. viii. 1885, p. 53, believes it to be a *Spastostyla sertulariarum*, torn from its attachment, which has swallowed the marginal body of a *Medusa*; but Hertwig denies this (Zool. Anz. viii. p. 108).]

Scyphidia ovata, *Epistylis fugitans*, *Opercularia elongata*, *O. rugosa*, *Pyxicola striata*, spp. nn., *Stylohedra lenticula*, g. & sp. nn.; Kellicott (55).

Epistylis ophidioides, sp. n., Buffalo, U.S.A.; Kellicott (56).

Trichonympha leidy, sp. n. [descriptions of spp. nn. of *Pyrsonympha* and *Lophomonas* deferred], parasitic in Termites, Tasmania; Kent (57).

Kerbert (58); *Chromatophagus parasiticus*, g. & sp. nn., on fresh-water fish, Zoological Gardens, Amsterdam.

Vaginicola bütschlii, sp. n., *Epistylis ophrydiiformis*, sp. n., Black Forest; Nüsslin 74).

Tintinnus fergusonii, sp. n., Ryder (83), Co. of Maryland, U.S.A. [imperfect description and no fig.].

Stokes describes and figures the following as new:—

Tillina saprophila, p. 135, *T. inflata*, spp. nn., p. 138 (91).

Ctedoctema acanthocrypta, g. & sp. nn. (92, 103).

Vorticella lockwoodii, sp. n. (93).

Opalina flava, sp. n., from rectum of a toad (*Scaphiopus holbrooki*) p. 1081, *Chilodon megalotroche*, sp. n., p. 1085, ectoparasitic on the rotifer *Megalotrocha* (94, 104).

Loxodes vorax, sp. n., *Apgaria undulans*, g. & sp. nn., *A. ovata*, *A. elongata*, spp. nn., *Ileonema dispar*, g. & sp. nn. [with a flagellum] (95).

Pyxicola constricta, sp. n., Delaware and Rariton Canal (97).

Hymenostoma hymenophora, g. & sp. nn., p. 121, *Trachelophyllum vestitum*, p. 122, *T. tachyblastum*, p. 123, *Litonotus pleurosigma*, *L. helus*, spp. nn., p. 124 (100).

Opercularia plicatilis, p. 226, *Epistylis vaginula*, p. 227, *Euplotes plumipes*, p. 229, *Cyclidium litonesum*, spp. nn., p. 230 (102).

SUCTORIA.

Trichophrya salparum, sp. n., Entz, (25) p. 297.

Acineta complanata, *A. trinacria*, and *Ophryodendron variabile*; Gruber (40).

SPOROZOA (GREGARINIDA).

Globidium leuckarti, g. & sp. nn., Flesch (27). A parasite of unknown affinity, but possibly a Sporozoon, found in the wall of the intestines of the horse.

A. Hammond, J. Micr. Nat. Sci. iii. p. 153, found *Gregarina scenuridis* in the ovary of *Tubifex*.

Psorospermium hackelii, sp. n., associated with the disease of the fresh-water crayfish; Hilgendorf (49); see also Linstow, Circ. deutsch. Fisch. Ver. pp. 216 & 217 (1883) [and *Crustacea*, p. 17].

Kunstler (60) describes an unnamed monocystid Gregarine from body cavity of *Periplaneta americana*.

Kunstler and Pitres (66) give an account of an unnamed *Psorosperm* found in pus from the human pleural cavity; it comes nearest to *Coccidia monospora*.

Ophryocystis bittschlii, g. & sp. nn., Schneider (89).

INDEX TO

GENERA AND SUBGENERA RECORDED AS NEW IN THIS VOLUME,

INCLUDING NEW NAMES FOR GENERA ALREADY CHARACTERIZED.*

The symbol || indicates that the name to which it is affixed has been used before in Zoology.]

- | | |
|---|--|
| Abietinaria, <i>Kirchenpauer</i> , Cœl. 13 | Amixia, <i>Reuter</i> , Ins. 306 |
| Abisa, <i>De Gregorio</i> , Moll. 82 | Amotura, <i>Cameron</i> , Ins. 154 |
| Acanthochalcis, <i>Cameron</i> , Ins. 154 | Amphelictus, <i>Bates</i> , Ins. 104 |
| Acanthochonia, <i>Hinde</i> , Spong. 2 | Amphibolia, <i>Snellen</i> , Ins. 237 |
| Acanthocryptus, <i>Thomson</i> , Ins. 147 | Amphicyclus, <i>Bell</i> , Ech. 9 |
| Acanthosepion, <i>Rochebrune</i> , Moll. 37 | Amyllium, <i>Reitter</i> , Ins. 48 |
| Acellalis, <i>Pagenstecher</i> , Ins. 239 | Anacanthiocnemis, <i>Reuter</i> , Ins. 309 |
| Aceratasmia, <i>Schmiedeknecht</i> , Ins. 134 | Anacropora, <i>Ridley</i> , Cœl. 15 |
| Aceros, <i>Lang</i> , Verm. 4 | Analycus, <i>Levinson</i> , Verm. 15 |
| Acervochalina, <i>Ridley</i> , Spong. 7 | Anamathia, <i>Smith</i> , Crust. 11 |
| Acesina, <i>Moore</i> , Ins. 192 | Anaximilla, <i>Poléjaeff</i> , Spong. 7 |
| Acinopsis, <i>Monterosato</i> , Moll. 49 | Anchonidium, <i>Bedel</i> , Ins. 98 |
| Acinus, <i>Monterosato</i> , Moll. 49 | Ancylogaster, <i>Bigot</i> , Ins. 263 |
| Aciphus, <i>Olliff</i> , Ins. 58 | Anepsiocoris, <i>Puton</i> , Ins. 302 |
| Acroctena, <i>Saalmüller</i> , Ins. 214 | Anepsiodes, <i>Reuter</i> , Ins. 302 |
| Acronyctodes, <i>Edwards</i> , Ins. 214 | Ania , <i>Distant</i> , Ins. 307 |
| Adalmus, <i>Reitter</i> , Ins. 48 | Anicera, <i>Jacoby</i> , Ins. 118 |
| Adeonella, <i>Bush</i> , Pol. 13 | Annona, <i>Distant</i> , Ins. 307 |
| Adolopus, <i>Sharp</i> , Ins. 34 | Anobothrus, <i>Levinson</i> , Verm. 15 |
| Adusta, <i>Jousseau</i> , Moll. 44 | Anomalanthus, <i>Bell</i> , Ech. 5 |
| Agabotus, <i>Distant</i> , Ins. 301 | Anonymus, <i>Lang</i> , Verm. 4 |
| Agathelot, <i>Schuffuss</i> , Ins. 51 | Anoplites, <i>Trouessart</i> , Arachn. 10 |
| Agilardiella, <i>Marshall</i> , Spong. 5 | Anoplocarpus, <i>Quedenfeldt</i> , Ins. 68 |
| Agisana, <i>Möschler</i> , Ins. 246 | Antias, <i>Distant</i> , Ins. 307 |
| Agisopterus, <i>Fairmaire</i> , Ins. 85 | Antillastreæ, <i>Duncan</i> , Cœl. 15 |
| Alampes, <i>Horvath</i> , Ins. 302 | Apalimua, <i>Bates</i> , Ins. 108 |
| Allorhagium, <i>Kolbe</i> , Ins. 104 | Apgaria, <i>Stokes</i> , Prot. 17 |
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| Alvinia, <i>Monterosato</i> , Moll. 49 | Aphanocera, <i>Jacoby</i> , Ins. 118 |
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| Amerinus, <i>Casey</i> , Ins. 27 | Aphiliops, <i>Reitter</i> , Ins. 47 |
| Ametropalpis, <i>Mabille</i> , Ins. 208 | Aphyllura, <i>Reitter</i> , Ins. 98 |
| Amichorus, <i>Sharp</i> , Ins. 40 | Aphytoceros, <i>Meyrick</i> , Ins. 239 |
| | Apicularia, <i>Monterosato</i> , Moll. 49 |
| | Apistobranchus, <i>Levinson</i> , Verm. 15 |

* This list contains 1033 names, inclusive of the *Arachnida* of 1883; this is a slight decrease.

- Aporus, *Lefèvre*, Ins. 114
 Apporasa, *Moore*, Ins. 192
 Apterodema, *Fairmaire*, Ins. 65
 Arabica, *Jousseau*, Moll. 44
 Aramuna, *Moore*, Ins. 227
 Archæastacus, *Bate*, Crust. 16
 Arctophrys, *Reitter*, Ins. 48
 Arctosmia, *Schmiedeknecht*, Ins. 134
 Areus, *Casey*, Ins. 44
 Argillotherium, *Davies*, Mamm. 41
 Arhytodes, *Reitter*, Ins. 48
 Armada, *Staudinger*, Ins. 227
 Asaroticus, *Jacovleff*, Ins. 301
 Ascarosepion, *Rochebrune*, Moll. 37
 Ascobius, *Henneguy*, Prot. 16
 Aseirba, *Cameron*, Ins. 154
 Aspidaster, *Loriol*, Ech. 7
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S. H. SCUDDER has published [Washington : 1882-1884], as No. 19 of the Bull. U. S. Mus., NOMENCLATOR ZOOLOGICUS : I. Supplemental List of Genera in Zoology [to the close of 1879], 376 pp. ; II. Universal Index to Genera in Zoology [to the close of 1879], 340 pp.

